

# **BID PROPOSAL INSTRUCTIONS**

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

## **PREQUALIFICATION**

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

## **WHO CAN BID ?**

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

## **REQUESTS FOR AUTHORIZATION TO BID**

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

## **WHAT CONSTITUTES WRITTEN AUTHORIZATION TO BID?**

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

## **ABOUT AUTHORIZATION TO BID**

Firms that have not received an Authorization to Bid or Not For Bid Report within a reasonable time of complete and correct original document submittal should contact the Department as to the status. Firms unsure as to authorization status should call the Prequalification Section of the Bureau of Construction at the number listed at the end of these instructions.

## **ADDENDA AND REVISIONS**

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

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

The Internet is the Department's primary way of doing business. The subscription service emails are an added courtesy the Department provides. It is suggested that bidders check IDOT's website at <http://www.idot.illinois.gov/doing-business/procurements/construction-services/construction-bulletins/transportation-bulletin/index#TransportationBulletin> before submitting final bid information.

***IDOT IS NOT RESPONSIBLE FOR ANY E-MAIL FAILURES.***

Addenda questions may be directed to the Contracts Office at (217)782-7806 or [DOT.D&Econtracts@illinois.gov](mailto:DOT.D&Econtracts@illinois.gov)

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

## **STANDARD GUIDELINES FOR SUBMITTING BIDS**

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

## **BID SUBMITTAL CHECKLIST**

- Cover page** (the sheet that has the item number on it) – This should be the first page of your bid proposal, **followed by your bid (the Schedule of Prices/Pay Items)**. If you are using special software or CBID to generate your schedule of prices, do not include the blank pages of the schedule of prices that came with the proposal package.
- Page 4 (Item 9)** – Check “YES” if you will use a subcontractor(s) with an annual value over \$50,000. Include the subcontractor(s) name, address, general type of work to be performed and the dollar amount. If you will use subcontractor(s) but are uncertain who or the dollar amount; check “YES” but leave the lines blank.
- After page 4** – Insert the following documents: The **Illinois Office Affidavit** (Not applicable to federally funded projects) followed by Cost Adjustments for Steel, Bituminous and Fuel (if applicable) and the Contractor Letter of Assent (if applicable). The general rule should be, if you don’t know where it goes, put it after page 4.
- Page 10 (Paragraph J)** – Check “YES” or “NO” whether your company has any business in Iran.
- Page 10 (Paragraph K)** – (Not applicable to federally funded projects) List the name of the apprenticeship and training program sponsor holding the certificate of registration from the US Department of Labor. If no applicable program exists, please indicate the work/job category. Do not include certificates with your bid. Keep the certificates in your office in case they are requested by IDOT.
- Page 11 (Paragraph L)** – A copy of your State Board of Elections certificate of registration is no longer required with your bid.
- Page 11 (Paragraph M)** – Indicate if your company has hired a lobbyist in connection with the job for which you are submitting the bid proposal.
- Page 12 (Paragraph C)** – This is a work sheet to determine if a completed Form A is required. It is not part of the form and you do not need to make copies for each completed Form A.
- Pages 14-17 (Form A)** – One Form A (4 pages) is required for each applicable person in your company. Copies of the forms can be used and only need to be changed when the information changes. The certification signature and date must be original for each letting. **Do not staple the forms together.** If you answered “NO” to all of the questions in Paragraph C (page 12), complete the first section (page 14) with your company information and then sign and date the Not Applicable statement on page 17.
- Page 18 (Form B)** - If you check “YES” to having other current or pending contracts it is acceptable to use the phrase, “See Affidavit of Availability on file”. **Ownership Certification** (at the bottom of the page) - Check N/A if the Form A(s) you submitted accounts for 100 percent of the company ownership. Check YES if any percentage of ownership falls outside of the parameters that require reporting on the Form A. Checking NO indicates that the Form A(s) you submitted is not correct and you will be required to submit a revised Form A.
- Page 20 (Workforce Projection)** – Be sure to include the Duration of the Project. It is acceptable to use the phrase “Per Contract Specifications”.

**Proposal Bid Bond** – (Insert after the proposal signature page) Submit your proposal Proposal Bid Bond (if applicable) using the current Proposal Bid Bond form provided in the proposal package. The Power of Attorney page should be stapled to the Proposal Bid Bond. If you are using an electronic bond, include your bid bond number on the Proposal Bid Bond and attach the Proof of Insurance printed from the Surety’s Web Site.

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

**The Bid Letting is now available in streaming Audio/Video from the IDOT Web Site.** A link to the stream will be placed on the main page of the current letting on the day of the Letting. The stream will not begin until 10 AM. The actual reading of the bids does not begin until approximately 10:30 AM.

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

**QUESTIONS: pre-letting up to execution of the contract**

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

**QUESTIONS: following contract execution**

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

RETURN WITH BID

1X

Proposal Submitted By
Name
Address
City

Letting November 21, 2014

**NOTICE TO PROSPECTIVE BIDDERS**

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

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



**Illinois Department  
of Transportation**

Springfield, Illinois 62764

**Contract No. 61A63  
LAKE County  
Section 11-00121-11-BR  
Route FAU 187 (Washington Street)  
Project CMM-9003(923)  
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
- An Annual Bid Bond is included or is on file with IDOT.

Prepared by

Checked by

F

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RETURN WITH BID



PROPOSAL

TO THE DEPARTMENT OF TRANSPORTATION

1. Proposal of \_\_\_\_\_

\_\_\_\_\_

Taxpayer Identification Number (Mandatory) \_\_\_\_\_

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

**Contract No. 61A63  
LAKE County  
Section 11-00121-11-BR  
Project CMM-9003(923)  
Route FAU 187 (Washington Street)  
District 1 Construction Funds**

**Project consists of the construction of a railroad underpass to carry the Wisconsin Central Ltd. Railroad over Washington Street, the reconstruction of the roadway, retaining wall construction, storm sewers, traffic signal modifications, construction of a shoofly track, water main, sanitary sewer, pavement markings and landscaping, located between Haryan Way and Lake Street in the Village of Grayslake.**

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 will govern performance and payments.







**RETURN WITH BID**

6. **COMBINATION BIDS.** The undersigned bidder 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 contract 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 will govern. Payment to the contractor awarded the contract will be made only for actual quantities of work performed and accepted or materials furnished according to the contract. The scheduled quantities of work to be done and materials to be furnished may be increased, decreased or omitted as provided elsewhere in the contract.
8. **AUTHORITY TO DO BUSINESS IN ILLINOIS.** Section 20-43 of the Illinois Procurement Code (the Code) (30 ILCS 500/20-43) provides that a person (other than an individual acting as a sole proprietor) must be a legal entity authorized to do business in the State of Illinois prior to submitting the bid.
9. **EXECUTION OF CONTRACT:** The Department of Transportation will, in accordance with the rules governing Department procurements, execute the contract and shall be the sole entity having the authority to accept performance and make payments under the contract. Execution of the contract by the Chief Procurement Officer (CPO) or the State Purchasing Officer (SPO) is for approval of the procurement process and execution of the contract by the Department. Neither the CPO nor the SPO shall be responsible for administration of the contract or determinations respecting performance or payment there under except as otherwise permitted in the Code.
10. **The services of a subcontractor will be used.**

Check box Yes   
 Check box No

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

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STATE JOB # - C-91-181-12  
 PPS NBR -

ILLINOIS DEPARTMENT OF TRANSPORTATION  
 SCHEDULE OF PRICES  
 CONTRACT NUMBER - 61A63

ECMS002 DTGECM03 ECMR003 PAGE 1  
 RUN DATE - 10/20/14  
 RUN TIME - 183127

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
A2006720	T-QUERCUS MACR 2-1/2	EACH	21.000 X				
A2007120	T-QUERCUS RUBRA 2-1/2	EACH	30.000 X				
A2008748	T-ULMUS X FRNTR 3 MH	EACH	8.000 X				
B2002220	T-CRAT VR WK TF 2-1/2	EACH	33.000 X				
B2005068	T-MALUS SND CL 7'	EACH	37.000 X				
B2005136	T-MALUS SS 2	EACH	50.000 X				
C20058G2	S-RHUS AROMA GL 2G	EACH	368.000 X				
C2009248	S-ROSA X KNOCKOUT 18	EACH	275.000 X				
D2001788	E-PICEA ABIES 8'	EACH	53.000 X				
D2002986	E-PINUS STROBUS 8'	EACH	29.000 X				
D2002996	E-PINUS STROBUS 10'	EACH	7.000 X				
K0012990	P PL ORNAMENT T GAL P	UNIT	9.400 X				
K0013055	P PL WETLAND EMERGENT	ACRE	1.000 X				
K0029632	WEED CONT N SEL/N RES	GALLON	14.000 X				
LR503200	LOAD CHARGE	LOAD	6.000 X				

COUNTY NAME LAKE	CODE 097	DIST 01	SECTION NUMBER 11-00121-11-BR	PROJECT NUMBER CMM-9003/923/000	ROUTE FAU 187
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ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
XX000366	CLAY LINER	CU FT	64,962.000	X	=		
XX001249	ORNAMENTAL FENCE	FOOT	1,289.000	X	=		
XX003032	GATE VALVES 12	EACH	4.000	X	=		
XX003358	SAN MAN 5	EACH	8.000	X	=		
XX005940	REMOTE CONTR VIDEO SY	EACH	1.000	X	=		
XX006253	SAN MH 4 DIA	EACH	1.000	X	=		
XX006277	TEMP SEDIMENT TRAP	EACH	1.000	X	=		
XX006655	LYR II DATALINK SWITCH	EACH	1.000	X	=		
XX006658	FLOCCULATION LOGS	EACH	2.000	X	=		
XX006659	FLOCCULATION POWDER	POUND	13.000	X	=		
XX007881	DOCUMENTATION CAMERAS	L SUM	1.000	X	=		
XX008253	VIDEO ENCODER	EACH	1.000	X	=		
XX008392	OUTDR RTD NTRK CABLE	FOOT	42.000	X	=		
XX008436	VALVE VAULTS 5 DIA	EACH	1.000	X	=		
XX008565	EVP BEACON LED RETRO	EACH	4.000	X	=		

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
XX008811	GATE SPECIAL	EACH	2.000 X	=	=	=	=
XX008935	BLUETOOTH DETECTOR	EACH	1.000 X	=	=	=	=
XX008959	D I WATER MAIN SPL	FOOT	42.000 X	=	=	=	=
XX008971	P C CYLINDER PIPE 20	FOOT	1,700.000 X	=	=	=	=
XX008972	PCCP 15 DEG BEND 20	EACH	5.000 X	=	=	=	=
XX008973	PCCP 30 DEG BEND 20	EACH	1.000 X	=	=	=	=
XX008974	PCCP 45 DEG BEND 20	EACH	1.000 X	=	=	=	=
XX008975	PCCP 90 DEG BEND 20	EACH	2.000 X	=	=	=	=
XX008976	PCCP CUSTOM FIT 20	EACH	4.000 X	=	=	=	=
X0321865	ANTI-GRAFFIT PROT SYS	SQ FT	20,185.000 X	=	=	=	=
X0322464	ABAN FILL EX SAN MAN	EACH	3.000 X	=	=	=	=
X0322936	REMOV EX FLAR END SEC	EACH	7.000 X	=	=	=	=
X0323002	TEMP ELECT SERV CONN	EACH	1.000 X	=	=	=	=
X0323523	REMOVE TEMP LIGHTING	L SUM	1.000 X	=	=	=	=
X0325346	RAILROAD TRACK	TRK FT	88.000 X	=	=	=	=

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
X0325462	MEDIA CONVERTER	EACH	1.000 X		=		
X0325714	FL BEACON P MTD SP IN	EACH	6.000 X		=		
X0326144	TAC/DET WARNING SURFC	SQ FT	1,108.000 X		=		
X0326358	STORM WATER TRTMT SYS	EACH	2.000 X		=		
X0326679	TEMP STRM SEW PLUG 36	EACH	1.000 X		=		
X0326712	ABAN FILL EX SAN SEW	EACH	5.000 X		=		
X0326899	SOLAR-POWER FB AS CMP	EACH	2.000 X		=		
X0327008	REM/REL SIGN SPECIAL	EACH	2.000 X		=		
X0327036	BIKE PATH REM	SQ YD	2,352.000 X		=		
X0327147	REM RR PLATFORM	SQ FT	3,800.000 X		=		
X0327357	CONSTRN VBRN MONITRNG	L SUM	1.000 X		=		
X0327367	STL CAS P BOR/JKD 24	FOOT	270.000 X		=		
X0327651	WAT MN IN CASING 12	FOOT	270.000 X		=		
X0327679	STL CAS P AUG/JKD 30	FOOT	120.000 X		=		
X0327700	STL SECURITY GATE 12	EACH	1.000 X		=		

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
X0327720	12" DUCTILE IRON FIT	EACH	1.000 X				
X0327725	ADD DEPTH OF MANHOLES	FOOT	130.000 X				
X0335700	P.S. GENERAL WORK	L SUM	1.000 X				
X0783300	P.S. ELECTRICAL WORK	L SUM	1.000 X				
X0783500	P.S. MECHANICAL WORK	L SUM	1.000 X				
X0811100	RAILROAD CROSSING	L SUM	1.000 X				
X0839900	SAN SEW REMOV 6	FOOT	32.000 X				
X2020502	BRACED EXCAVATION	CU YD	3,976.000 X				
X2502014	SEEDING CL 4A MOD	ACRE	1.000 X				
X2511630	EROS CONT BLANKET SPL	SQ YD	4,267.000 X				
X2800500	INLET PROTECTION SPL	EACH	2.000 X				
X4023000	TEMP ACCESS- ROAD	EACH	1.000 X				
X4060995	TEMPORARY RAMP SPL	SQ YD	862.000 X				
X5030225	CONC STRUCT SPL	CU YD	1,394.700 X				
X5030290	STAIN CONC STRUCTURES	SQ FT	20,185.000 X				

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ILLINOIS DEPARTMENT OF TRANSPORTATION  
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ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
X5051900	STEEL GRATE WALKWAY	SQ YD	104.000 X	=		=	
X5210210	HLMR BRG GUID EXP 700	EACH	3.000 X	=		=	
X5210360	HLMR BRNG FIXED 700K	EACH	1.000 X	=		=	
X5210770	HLMR BRG N-G EXP 200	EACH	2.000 X	=		=	
X5429311	TRAVERS PIPE GRATE SP	FOOT	46.000 X	=		=	
X5610649	PLUG WATER MAIN 12	EACH	2.000 X	=		=	
X5610680	WATER MAIN PROTECTION	FOOT	1,700.000 X	=		=	
X5610712	WATER MAIN REMOV 12	FOOT	1,024.000 X	=		=	
X5610720	WATER MAIN REMOV 20	FOOT	1,421.000 X	=		=	
X5630012	CUT & CAP EX 12 WM	EACH	2.000 X	=		=	
X5860110	GRANULAR BACKFILL STR	CU YD	2,612.000 X	=		=	
X6013600	PIPE UNDERDRAIN 4 MOD	FOOT	4,095.000 X	=		=	
X6020090	MANOLE W/RESTRICT PLT	EACH	3.000 X	=		=	
X6026050	SANITARY MANHOLE ADJ	EACH	7.000 X	=		=	
X6026051	SAN MAN RECONST	EACH	8.000 X	=		=	

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ILLINOIS DEPARTMENT OF TRANSPORTATION  
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ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
X6026054	SAN MAN REMOVED	EACH	1.000 X				
X6026622	VV REMOVED	EACH	1.000 X				
X6030205	FR & GRATES ADJUST SP	EACH	4.000 X				
X6300215	RAIL ELEMENT PLATES	EACH	1.000 X				
X6640200	TEMP CH LK FENCE	FOOT	16.000 X				
X6700405	ENGR FLD OFF A MOD	CAL MD	24.000 X				
X7010216	TRAF CONT & PROT SPL	L SUM	1.000 X				
X7800455	POLYUREA PM T1 R M	SQ FT	309.000 X				
X7810300	REC REF PVT MARKER	EACH	204.000 X				
X8410105	TEMP LIGHTING SYSTEM	EACH	8.000 X				
X8570215	FAC IN EXIST CAB	EACH	1.000 X				
X8620200	UNINTER POWER SUP SPL	EACH	1.000 X				
X8710029	FIB OPT CBL 24F SM	FOOT	8,564.000 X				
X8730571	EC C COAXIAL	FOOT	330.000 X				
X8730800	ELCBL C VIDEO 20 4C	FOOT	330.000 X				



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ILLINOIS DEPARTMENT OF TRANSPORTATION  
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ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
Z0001100	AIR RELEASE VALVE	EACH	1.000 X				
Z0002400	BALLAST	TON	848.000 X				
Z0010688	CAMERA MOUNT ASSEMBLY	EACH	1.000 X				
Z0013797	STAB CONSTR ENTRANCE	SQ YD	669.000 X				
Z0013798	CONSTRUCTION LAYOUT	L SUM	1.000 X				
Z0018500	DRAINAGE STR CLEANED	EACH	16.000 X				
Z0019600	DUST CONTROL WATERING	UNIT	1,515.000 X				
Z0022800	FENCE REMOVAL	FOOT	240.000 X				
Z0027800	GEOTECH FABRIC	SQ YD	599.000 X				
Z0029602	TEMPORARY SIGNING	EACH	8.000 X				
Z0045100	PRESS CONNECT 12X12	EACH	2.000 X				
Z0046304	P UNDR FOR STRUCT 4	FOOT	1,140.000 X				
Z0046306	P UNDR FOR STRUCT 6	FOOT	391.000 X				
Z0046308	P UNDR FOR STRUCT 8	FOOT	501.000 X				
Z0047400	PUMP HOUSE COMPL	L SUM	1.000 X				

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
Z0048400	RAILROAD CROSSING REM	EACH	3.000 X	=			
Z0048665	RR PROT LIABILITY INS	L SUM	1.000 X	=			
Z0056900	SAN SEW 8	FOOT	125.000 X	=			
Z0057400	SAN SEW 21	FOOT	1,511.000 X	=			
Z0062456	TEMP PAVEMENT	SQ YD	7,262.000 X	=			
Z0067600	STEEL CASINGS 18	FOOT	80.000 X	=			
Z0068200	STEEL CASINGS 30	FOOT	305.000 X	=			
Z0069700	SUB-BALLAST	CU YD	2,758.000 X	=			
Z0070200	SURVEY MONUMENTS	EACH	17.000 X	=			
Z0073002	TEMP SOIL RETEN SYSTM	SQ FT	23,011.000 X	=			
Z0076000	TRACK INSTALL COMPL	FOOT	2,384.000 X	=			
Z0076100	TRACK REMOVAL	FOOT	2,384.000 X	=			
Z0076300	TRACK WORK	FOOT	1,629.000 X	=			
Z0076600	TRAINEES	HOURL	3,000.000 X	=	0.80	2,400.00	
Z0076604	TRAINEES TPG	HOURL	3,000.000 X	=	15.00	45,000.00	

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
20100110	TREE REMOV 6-15	UNIT	1,881.000 X	=			
20100210	TREE REMOV OVER 15	UNIT	660.000 X	=			
20200100	EARTH EXCAVATION	CU YD	70,280.000 X	=			
20201200	REM & DISP UNS MATL	CU YD	27,665.000 X	=			
20400800	FURNISHED EXCAVATION	CU YD	12,490.000 X	=			
20800150	TRENCH BACKFILL	CU YD	9,039.000 X	=			
21101615	TOPSOIL F & P 4	SQ YD	68,230.000 X	=			
21101695	TOPSOIL F & P 30	SQ YD	675.000 X	=			
21301052	EXPLOR TRENCH 52	FOOT	1,020.000 X	=			
25000115	SEEDING CL 1B	ACRE	3.700 X	=			
25000210	SEEDING CL 2A	ACRE	0.900 X	=			
25000312	SEEDING CL 4A	ACRE	7.900 X	=			
25000314	SEEDING CL 4B	ACRE	0.600 X	=			
25000400	NITROGEN FERT NUTR	POUND	408.000 X	=			
25000600	POTASSIUM FERT NUTR	POUND	408.000 X	=			

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				DOLLARS	CENTS	DOLLARS	CTS
25000750	MOWING	ACRE	4.500 X	=		=	
25000775	SELECT MOWING STAKES	EACH	85.000 X	=		=	
25100115	MULCH METHOD 2	ACRE	26.000 X	=		=	
25100630	EROSION CONTR BLANKET	SQ YD	125,849.000 X	=		=	
25200110	SODDING SALT TOLERANT	SQ YD	446.000 X	=		=	
25200200	SUPPLE WATERING	UNIT	1.000 X	=		=	
28000250	TEMP EROS CONTR SEED	POUND	26,014.000 X	=		=	
28000305	TEMP DITCH CHECKS	FOOT	960.000 X	=		=	
28000400	PERIMETER EROS BAR	FOOT	14,259.000 X	=		=	
28000510	INLET FILTERS	EACH	51.000 X	=		=	
28100107	STONE RIPRAP CL A4	SQ YD	12.000 X	=		=	
28200200	FILTER FABRIC	SQ YD	12.000 X	=		=	
30300112	AGG SUBGRADE IMPR 12	SQ YD	15,033.000 X	=		=	
31101200	SUB GRAN MAT B 4	SQ YD	7,660.000 X	=		=	
35101600	AGG BASE CSE B 4	SQ YD	2,240.000 X	=		=	

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				DOLLARS	CENTS	DOLLARS	CTS
35101800	AGG BASE CSE B 6	SQ YD	3,220.000 X	=			
35102000	AGG BASE CSE B 8	SQ YD	259.000 X	=			
35501316	HMA BASE CSE 8	SQ YD	398.000 X	=			
40200500	AGG SURF CSE A 6	SQ YD	1,412.000 X	=			
40200720	AGG SURF CSE A 12	SQ YD	2,177.000 X	=			
40300300	BIT MATLS C&S CT	GALLON	65.000 X	=			
40600275	BIT MATLS PR CT	POUND	32,667.000 X	=			
40600982	HMA SURF REM BUTT JT	SQ YD	19.000 X	=			
40603085	HMA BC IL-19.0 N70	TON	51.000 X	=			
40603340	HMA SC "D" N70	TON	2,083.000 X	=			
42000301	PCC PVT 8 JOINTED	SQ YD	11,488.000 X	=			
42001300	PROTECTIVE COAT	SQ YD	15,624.000 X	=			
42300200	PCC DRIVEWAY PAVT 6	SQ YD	110.000 X	=			
42400200	PC CONC SIDEWALK 5	SQ FT	16,533.000 X	=			
42400800	DETECTABLE WARNINGS	SQ FT	272.000 X	=			

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				DOLLARS	CENTS	DOLLARS	CTS
44000100	PAVEMENT REM	SQ YD	19,005.000 X	=			
44000157	HMA SURF REM 2	SQ YD	12,891.000 X	=			
44000200	DRIVE PAVEMENT REM	SQ YD	122.000 X	=			
44000500	COMB CURB GUTTER REM	FOOT	1,284.000 X	=			
44000600	SIDEWALK REM	SQ FT	1,049.000 X	=			
44004250	PAVED SHLD REMOVAL	SQ YD	60.000 X	=			
48101500	AGGREGATE SHLDS B 6	SQ YD	22.000 X	=			
48203021	HMA SHOULDERS 6	SQ YD	132.000 X	=			
50200100	STRUCTURE EXCAVATION	CU YD	10,050.000 X	=			
50300225	CONC STRUCT	CU YD	1,645.900 X	=			
50300285	FORM LINER TEX SURF	SQ FT	17,170.000 X	=			
50500105	F & E STRUCT STEEL	L SUM	1.000 X	=			
50700105	TREATED TIMBER	F.B.M.	7,718.000 X	=			
50700305	HARDWARE	POUND	5,001.000 X	=			
50800205	REINF BARS, EPOXY CTD	POUND	290,840.000 X	=			

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				DOLLARS	CENTS	DOLLARS	CTS
50800515	BAR SPLICERS	EACH	192.000 X	=			
50901760	PIPE HANDRAIL	FOOT	225.000 X	=			
51201600	FUR STL PILE HP12X53	FOOT	8,848.000 X	=			
51201900	FUR STL PILE HP14X89	FOOT	7,941.000 X	=			
51202305	DRIVING PILES	FOOT	16,789.000 X	=			
51203600	TEST PILE ST HP12X53	EACH	2.000 X	=			
51203900	TEST PILE ST HP14X89	EACH	2.000 X	=			
51500100	NAME PLATES	EACH	1.000 X	=			
52100540	ANCHOR BOLTS 1 1/2	EACH	24.000 X	=			
54213663	PRC FLAR END SEC 18	EACH	2.000 X	=			
54213669	PRC FLAR END SEC 24	EACH	4.000 X	=			
5422A012	P CUL CL A 2 12 TEMP	FOOT	148.000 X	=			
550A0050	STORM SEW CL A 1 12	FOOT	32.000 X	=			
550A0070	STORM SEW CL A 1 15	FOOT	97.000 X	=			
550A0110	STORM SEW CL A 1 21	FOOT	6.000 X	=			

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ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
550A0160	STORM SEW CL A 1 36	FOOT	62.000 X	=			
550A0340	STORM SEW CL A 2 12	FOOT	842.000 X	=			
550A0360	STORM SEW CL A 2 15	FOOT	332.000 X	=			
550A0380	STORM SEW CL A 2 18	FOOT	129.000 X	=			
550A0400	STORM SEW CL A 2 21	FOOT	5.000 X	=			
550A0410	STORM SEW CL A 2 24	FOOT	552.000 X	=			
550A0430	STORM SEW CL A 2 30	FOOT	240.000 X	=			
550A0680	STORM SEW CL A 3 18	FOOT	89.000 X	=			
550A0710	STORM SEW CL A 3 24	FOOT	56.000 X	=			
550A0750	STORM SEW CL A 3 36	FOOT	254.000 X	=			
55100500	STORM SEWER REM 12	FOOT	678.000 X	=			
55100700	STORM SEWER REM 15	FOOT	33.000 X	=			
55100900	STORM SEWER REM 18	FOOT	93.000 X	=			
55101200	STORM SEWER REM 24	FOOT	95.000 X	=			
56103000	D I WATER MAIN 6	FOOT	20.000 X	=			



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ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
56103300	D I WATER MAIN 12	FOOT	1,340.000 X	=			
56105780	BUTTERFLY VALVES 20	EACH	2.000 X	=			
56300100	ADJ SAN SEWER 8 LESS	FOOT	50.000 X	=			
56400500	FIRE HYDNTS TO BE REM	EACH	2.000 X	=			
56400710	FIRE HYDNT & VAL SPL	EACH	5.000 X	=			
56400820	FIRE HYD W/AUX V & VB	EACH	2.000 X	=			
58000100	MEMBRANE WATERPROOF	SQ FT	1,960.000 X	=			
59100100	GEOCOMPOSITE WALL DR	SQ YD	1,959.000 X	=			
60107700	PIPE UNDERDRAINS 6	FOOT	630.000 X	=			
60200805	CB TA 4 DIA T8G	EACH	5.000 X	=			
60201005	CB TA 4 DIA T10F&G	EACH	3.000 X	=			
60201340	CB TA 4 DIA T24F&G	EACH	8.000 X	=			
60205040	CB TA 5 DIA T24F&G	EACH	5.000 X	=			
60218400	MAN TA 4 DIA T1F CL	EACH	3.000 X	=			
60221100	MAN TA 5 DIA T1F CL	EACH	8.000 X	=			

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ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
60223800	MAN TA 6 DIA T1F CL	EACH	1.000 X		=		
60224446	MAN TA 7 DIA T1F CL	EACH	2.000 X		=		
60224449	MAN TA 7 DIA T24F&G	EACH	1.000 X		=		
60237470	INLETS TA T24F&G	EACH	7.000 X		=		
60248900	VV TA 5 DIA T1F CL	EACH	6.000 X		=		
60249010	VV TA 6 DIA T1F CL	EACH	2.000 X		=		
60253100	CB RECON NEW T1F CL	EACH	1.000 X		=		
60500040	REMOV MANHOLES	EACH	1.000 X		=		
60500050	REMOV CATCH BAS	EACH	3.000 X		=		
60500060	REMOV INLETS	EACH	3.000 X		=		
60602800	CONC GUTTER TB	FOOT	810.000 X		=		
60603800	COMB CC&G TB6.12	FOOT	1,640.000 X		=		
60605000	COMB CC&G TB6.24	FOOT	4,462.000 X		=		
60619600	CONC MED TSB6.12	SQ FT	5,576.000 X		=		
60900515	CONC THRUST BLOCKS	EACH	11.000 X		=		

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ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
61140200	STORM SEWER SPEC 12	FOOT	37.000 X	=			
61140400	STORM SEWER SPEC 15	FOOT	68.000 X	=			
61140600	STORM SEWER SPEC 18	FOOT	64.000 X	=			
61140900	STORM SEWER SPEC 24	FOOT	776.000 X	=			
63000007	SPBGR TY B 6FT POSTS	FOOT	312.500 X	=			
67100100	MOBILIZATION	L SUM	1.000 X	=			
67201100	SEAL ABAN MONIT WELLS	EACH	2.000 X	=			
70106800	CHANGEABLE MESSAGE SN	CAL MO	120.000 X	=			
70300100	SHORT TERM PAVT MKING	FOOT	1,410.000 X	=			
70300510	PAVT MARK TAPE T3 L&S	SQ FT	236.000 X	=			
70300520	PAVT MARK TAPE T3 4	FOOT	14,216.000 X	=			
70300540	PAVT MARK TAPE T3 6	FOOT	682.000 X	=			
70300560	PAVT MARK TAPE T3 12	FOOT	828.000 X	=			
70300570	PAVT MARK TAPE T3 24	FOOT	106.000 X	=			
70301000	WORK ZONE PAVT MK REM	SQ FT	6,826.000 X	=			

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ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
70400100	TEMP CONC BARRIER	FOOT	363.000 X				
70400200	REL TEMP CONC BARRIER	FOOT	81.000 X				
72000100	SIGN PANEL T1	SQ FT	7.500 X				
78000100	THPL PVT MK LTR & SYM	SQ FT	702.000 X				
78000200	THPL PVT MK LINE 4	FOOT	22,590.000 X				
78000300	THPL PVT MK LINE 5	FOOT	249.000 X				
78000400	THPL PVT MK LINE 6	FOOT	2,262.000 X				
78000600	THPL PVT MK LINE 12	FOOT	2,158.000 X				
78000650	THPL PVT MK LINE 24	FOOT	327.000 X				
78001100	PT PVT MK LTRS & SYMB	SQ FT	90.000 X				
78001110	PAINT PVT MK LINE 4	FOOT	2,140.000 X				
78008200	POLYUREA PM T1 LTR-SY	SQ FT	73.000 X				
78008210	POLYUREA PM T1 LN 4	FOOT	8,562.000 X				
78008220	POLYUREA PM T1 LN 5	FOOT	8,202.000 X				
78008230	POLYUREA PM T1 LN 6	FOOT	499.000 X				

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
78008250	POLYUREA PM T1 LN 12	FOOT	619.000 X	=			
78008270	POLYUREA PM T1 LN 24	FOOT	84.000 X	=			
78100200	TEMP RAIS REF PVT MKR	EACH	176.000 X	=			
78300100	PAVT MARKING REMOVAL	SQ FT	6,566.000 X	=			
78300200	RAISED REF PVT MK REM	EACH	158.000 X	=			
80500020	SERV INSTALL POLE MT	EACH	1.000 X	=			
81028200	UNDRGRD C GALVS 2	FOOT	2,332.000 X	=			
81028210	UNDRGRD C GALVS 2 1/2	FOOT	81.000 X	=			
81028240	UNDRGRD C GALVS 4	FOOT	76.000 X	=			
81400100	HANDHOLE	EACH	5.000 X	=			
85000300	MAIN EX TR SIG INSTAL	L SUM	1.000 X	=			
87300925	ELCBL C TRACER 14 1C	FOOT	8,564.000 X	=			
87301215	ELCBL C SIGNAL 14 2C	FOOT	934.000 X	=			
87301225	ELCBL C SIGNAL 14 3C	FOOT	1,291.000 X	=			
87301805	ELCBL C SERV 6 2C	FOOT	120.000 X	=			

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE		TOTAL PRICE	
				DOLLARS	CENTS	DOLLARS	CTS
87301900	ELCBL C EGRDC 6 1C	FOOT	579.000 X				
87502440	TS POST GALVS 10	EACH	2.000 X				
87502500	TS POST GALVS 16	EACH	3.000 X				
87800100	CONC FDN TY A	FOOT	20.000 X				
87900200	DRILL EX HANDHOLE	EACH	6.000 X				
88030020	SH LED 1F 3S MAM	EACH	4.000 X				
88030100	SH LED 1F 5S BM	EACH	4.000 X				
88030110	SH LED 1F 5S MAM	EACH	4.000 X				
88102717	PED SH LED 1F BM CDT	EACH	8.000 X				
88200210	TS BACKPLATE LOU ALUM	EACH	8.000 X				
88600600	DET LOOP REPL	FOOT	888.000 X				
88800100	PED PUSH-BUTTON	EACH	8.000 X				
89502210	MOD EX CONTR CAB	EACH	1.000 X				
89502375	REMOV EX TS EQUIP	EACH	1.000 X				

TOTAL \$

NOTE:  
 \*\*\* PLEASE TURN PAGE FOR IMPORTANT NOTES \*\*\*

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NOTE:

1. EACH PAY ITEM SHOULD HAVE A UNIT PRICE AND A TOTAL PRICE.
2. THE UNIT PRICE SHALL GOVERN IF NO TOTAL PRICE IS SHOWN OR IF THERE IS A DISCREPANCY BETWEEN THE PRODUCT OF THE UNIT PRICE MULTIPLIED BY THE QUANTITY.
3. IF A UNIT PRICE IS OMITTED, THE TOTAL PRICE WILL BE DIVIDED BY THE QUANTITY IN ORDER TO ESTABLISH A UNIT PRICE.
4. A BID MAY BE DECLARED UNACCEPTABLE IF NEITHER A UNIT PRICE NOR A TOTAL PRICE IS SHOWN.

## RETURN WITH BID

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

#### I. GENERAL

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

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

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

I acknowledge, understand and accept these terms and conditions.

#### II. ASSURANCES

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

##### A. Conflicts of Interest

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 State 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 State Toll Highway Authority.

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

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

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

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

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



## RETURN WITH BID

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. Information concerning the exemption process is available from the Department upon request.

### **B. Negotiations**

Section 50-15. Negotiations.

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.

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

### **C. Inducements**

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.

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

### **D. Revolving Door Prohibition**

Section 50-30. Revolving door prohibition.

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

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

### **E. Reporting Anticompetitive Practices**

Section 50-40. Reporting anticompetitive practices.

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

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

### **F. Confidentiality**

Section 50-45. Confidentiality.

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

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

## RETURN WITH BID

### G. Insider Information

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.

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.

I acknowledge, understand and accept these terms and conditions for the above assurances.

### III. CERTIFICATIONS

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

#### A. Bribery

Section 50-5. Bribery.

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

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

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

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

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

(2) the business demonstrates to the governmental entity with which it seeks to contract, or which is signatory to the contract which the subcontract relates, and that entity finds that the commission of the offense was not authorized, requested, commanded, or performed by a director, officer, or high managerial agent on behalf of the business as provided in paragraph (2) of subsection (a) of Section 5-4 of the Criminal Code of 2012.

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

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

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

#### B. Felons

Section 50-10. Felons.

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

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

## RETURN WITH BID

### **C. Debt Delinquency**

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

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

### **D. Prohibited Bidders, Contractors and Subcontractors**

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

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

### **E. Section 42 of the Environmental Protection Act**

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

### **F. Educational Loan**

Section 3 of the Educational Loan Default Act provides 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.

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

### **G. Bid-Rigging/Bid Rotating**

Section 33E-11 of the Criminal Code of 2012 provides:

(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.

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

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

## RETURN WITH BID

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

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

### **H. International Anti-Boycott**

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

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

### **I. Drug Free Workplace**

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.

The bidder certifies that if awarded a contract in excess of \$5,000 it will provide a drug free workplace in compliance with the provisions of the Act.

### **J. Disclosure of Business Operations in Iran**

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

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

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

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

Check the appropriate statement:

Company has no business operations in Iran to disclose.

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

## RETURN WITH BID

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

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

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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.

**RETURN WITH BID**

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

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

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

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

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

**M. Lobbyist Disclosure**

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

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

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

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

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

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

Or

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

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

I acknowledge, understand and accept these terms and conditions for the above certifications.

## RETURN WITH BID

### IV. DISCLOSURES

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

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

### B. Financial Interests and Conflicts of Interest

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

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

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

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

### C. Disclosure Form Instructions

#### Form A Instructions for Financial Information & Potential Conflicts of Interest

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

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

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

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

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

## RETURN WITH BID

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

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

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

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

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



RETURN WITH BID

ILLINOIS DEPARTMENT OF TRANSPORTATION

Form A Financial Information & Potential Conflicts of Interest Disclosure

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

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

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

DISCLOSURE OF FINANCIAL INFORMATION

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

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

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

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

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

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

**RETURN WITH BID**

3. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor? Yes \_\_\_ No \_\_\_
4. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15% in aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of two times the salary of the Governor? Yes \_\_\_ No \_\_\_

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

Yes \_\_\_ No \_\_\_

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

1. Is your spouse or any minor children currently an officer or employee of the Capitol Development Board or the Illinois State Toll Highway Authority? Yes \_\_\_ No \_\_\_
2. Is your spouse or any minor children currently appointed to or employed by any agency of the State of Illinois? If your spouse or minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, provide the name of the spouse and/or minor children, the name of the State agency for which he/she is employed and his/her annual salary. \_\_\_\_\_

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

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(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 \_\_\_

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

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(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 \_\_\_

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

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

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**RETURN WITH BID**

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

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(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 \_\_\_

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(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 \_\_\_

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**3. Communication Disclosure.**

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

Name and address of person(s): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**RETURN WITH BID**

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

Name of person(s): \_\_\_\_\_

Nature of disclosure: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**APPLICABLE STATEMENT**

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

Completed by:  \_\_\_\_\_  
Signature of Individual or Authorized Representative Date

**NOT APPLICABLE STATEMENT**

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

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

\_\_\_\_\_  
Signature of Authorized Representative Date

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

RETURN WITH BID

ILLINOIS DEPARTMENT OF TRANSPORTATION

Form B Other Contracts & Financial Related Information Disclosure

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

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

DISCLOSURE OF OTHER CONTRACTS AND PROCUREMENT RELATED INFORMATION

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

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

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

THE FOLLOWING STATEMENT MUST BE CHECKED

Signature of Authorized Representative, Date

OWNERSHIP CERTIFICATION

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

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

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

## **RETURN WITH BID**

### **SPECIAL NOTICE TO CONTRACTORS**

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

#### **CONSTRUCTION EMPLOYEE UTILIZATION PROJECTION**

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



**RETURN WITH BID**

**Contract No. 61A63  
LAKE County  
Section 11-00121-11-BR  
Project CMM-9003(923)  
Route FAU 187 (Washington Street)  
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. 61A63  
LAKE County  
Section 11-00121-11-BR  
Project CMM-9003(923)  
Route FAU 187 (Washington Street)  
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.



This Annual Proposal Bid Bond shall become effective at 12:01 AM (CDST) on \_\_\_\_\_ and shall be valid until \_\_\_\_\_ 11:59 PM (CDST).

KNOW ALL PERSONS BY THESE PRESENTS, That We \_\_\_\_\_

as PRINCIPAL, and \_\_\_\_\_

as SURETY, 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 the bid proposal under "Proposal Guaranty" in effect on the date of the Invitation for Bids, whichever is the lesser sum, well and truly to be paid unto said STATE OF ILLINOIS, for the payment of which we bind ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH that whereas, the PRINCIPAL may submit bid proposal(s) to the STATE OF ILLINOIS, acting through the Department of Transportation, for various improvements published in the Transportation Bulletin during the effective term indicated above.

NOW, THEREFORE, if the Department shall accept the bid proposal(s) of the PRINCIPAL; and if the PRINCIPAL shall, within the time and as specified in the bidding and contract documents; 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 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 has caused this instrument to be signed by its officer \_\_\_\_\_ day of \_\_\_\_\_ A.D., \_\_\_\_\_

In TESTIMONY WHEREOF, the said SURETY has caused this instrument to be signed by its officer \_\_\_\_\_ day of \_\_\_\_\_ A.D., \_\_\_\_\_

\_\_\_\_\_  
(Company Name)

\_\_\_\_\_  
(Company Name)

By \_\_\_\_\_  
(Signature and Title)

By \_\_\_\_\_  
(Signature of Attorney-in-Fact)

**Notary for PRINCIPAL**

**Notary for SURETY**

STATE OF \_\_\_\_\_  
COUNTY OF \_\_\_\_\_

STATE OF \_\_\_\_\_  
COUNTY OF \_\_\_\_\_

Signed and attested before me on \_\_\_\_\_ (date)

Signed and attested before me on \_\_\_\_\_ (date)

by \_\_\_\_\_  
(Name of Notary Public)

by \_\_\_\_\_  
(Name of Notary Public)

(Seal) \_\_\_\_\_  
(Signature of Notary Public)

(Seal) \_\_\_\_\_  
(Signature of Notary Public)

\_\_\_\_\_  
(Date Commission Expires)

\_\_\_\_\_  
(Date Commission Expires)

In lieu of completing the above section of the Annual Proposal Bid Bond form, the Principal may file an Electronic Bid Bond. By signing the proposal(s) 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
--------------------------	---------------------	---------------------

This bond may be terminated, at Surety's request, upon giving not less than thirty (30) days prior written notice of the cancellation/termination of the bond. Said written notice shall be issued to the Illinois Department of Transportation, Chief Contracts Official, 2300 South Dirksen Parkway, Springfield, Illinois, 62764, and shall be served in person, by receipted courier delivery or certified or registered mail, return receipt requested. Said notice period shall commence on the first calendar day following the Department's receipt of written cancellation/termination notice. Surety shall remain firmly bound to all obligations herein for proposals submitted prior to the cancellation/termination. Surety shall be released and discharged from any obligation(s) for proposals submitted for any letting or date after the effective date of cancellation/termination.



Return with Bid

Division of Highways
Proposal Bid Bond

Item No. \_\_\_\_\_

Letting Date \_\_\_\_\_

KNOW ALL PERSONS BY THESE PRESENTS, That We \_\_\_\_\_

as PRINCIPAL, and \_\_\_\_\_

as SURETY, 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 the bid proposal under "Proposal Guaranty" in effect on the date of the Invitation for Bids, whichever is the lesser sum, well and truly to be paid unto said STATE OF ILLINOIS, for the payment of which we bind ourselves, our heirs, executors, administrators, successors and assigns.

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

NOW, THEREFORE, if the Department shall accept the bid proposal of the PRINCIPAL; and if the PRINCIPAL shall, within the time and as specified in the bidding and contract documents; 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 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 has caused this instrument to be signed by its officer \_\_\_\_\_ day of \_\_\_\_\_ A.D., \_\_\_\_\_

In TESTIMONY WHEREOF, the said SURETY has caused this instrument to be signed by its officer \_\_\_\_\_ day of \_\_\_\_\_ A.D., \_\_\_\_\_

(Company Name)

(Company Name)

By \_\_\_\_\_ (Signature and Title)

By \_\_\_\_\_ (Signature of Attorney-in-Fact)

Notary for PRINCIPAL

Notary for SURETY

STATE OF \_\_\_\_\_
COUNTY OF \_\_\_\_\_

STATE OF \_\_\_\_\_
COUNTY OF \_\_\_\_\_

Signed and attested before me on \_\_\_\_\_ (date)
by \_\_\_\_\_

Signed and attested before me on \_\_\_\_\_ (date)
by \_\_\_\_\_

(Name of Notary Public)

(Name of Notary Public)

(Seal) \_\_\_\_\_ (Signature of Notary Public)

(Seal) \_\_\_\_\_ (Signature of Notary Public)

(Date Commission Expires)

(Date Commission Expires)

In lieu of completing the above section of the Proposal Bid Bond form, the Principal may file an Electronic Bid Bond. By signing the proposal the Principal is ensuring the identified electronic bid bond has been executed and the Principal and Surety are firmly bound unto the State of Illinois under the conditions of the bid bond as shown above.

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

**(1) Policy**

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

**(2) Obligation**

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

**(3) Project and Bid Identification**

Complete the following information concerning the project and bid:

Route _____	Total Bid _____
Section _____	Contract DBE Goal _____ (Percent) _____ (Dollar Amount)
Project _____	
County _____	
Letting Date _____	
Contract No. _____	
Letting Item No. _____	

**(4) Assurance**

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

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

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

Failed to meet contract award goals and has included good faith effort documentation to meet the goals and that my company has provided participation as follows:

Disadvantaged Business Participation \_\_\_\_\_ percent

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

\_\_\_\_\_  
Company

By \_\_\_\_\_

Title \_\_\_\_\_

Date \_\_\_\_\_

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

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

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

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



# PROPOSAL ENVELOPE



# PROPOSALS

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

Item No.	Item No.	Item No.

Submitted By:

Name:
Address:
Phone No.

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

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

## **NOTICE**

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



# CONTRACTOR OFFICE COPY OF CONTRACT SPECIFICATIONS

## NOTICE

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

**Contract No. 61A63  
LAKE County  
Section 11-00121-11-BR  
Project CMM-9003(923)  
Route FAU 187 (Washington Street)  
District 1 Construction Funds**



**Illinois Department of Transportation**

## **SUBCONTRACTOR DOCUMENTATION**

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

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

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

## RETURN WITH SUBCONTRACT

### STATE ETHICAL STANDARDS GOVERNING SUBCONTRACTORS

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

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

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

#### **A. Bribery**

Section 50-5. Bribery.

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

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

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

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

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

(2) the business demonstrates to the governmental entity with which it seeks to contract, or which is signatory to the contract to which the subcontract relates, and that entity finds that the commission of the offense was not authorized, requested, commanded, or performed by a director, officer, or high managerial agent on behalf of the business as provided in paragraph (2) of subsection (a) of Section 5-4 of the Criminal Code of 2012.

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

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

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

#### **B. Felons**

Section 50-10. Felons.

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

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

## RETURN WITH SUBCONTRACT

### **C. Debt Delinquency**

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

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

### **D. Prohibited Bidders, Contractors and Subcontractors**

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

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

### **E. Section 42 of the Environmental Protection Act**

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

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

\_\_\_\_\_  
Name of Subcontracting Company

\_\_\_\_\_  
Authorized Officer

\_\_\_\_\_  
Date

**RETURN WITH SUBCONTRACT**  
**SUBCONTRACTOR DISCLOSURES**

**I. DISCLOSURES**

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

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

**B. Financial Interests and Conflicts of Interest**

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

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

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

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

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

**C. Disclosure Form Instructions**

**Form A Instructions for Financial Information & Potential Conflicts of Interest**

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

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

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

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

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

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

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

## RETURN WITH SUBCONTRACT

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

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

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

ILLINOIS DEPARTMENT OF TRANSPORTATION

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

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

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). Subcontractors desiring to enter into a subcontract of a State of Illinois contract must disclose the financial information and potential conflict of interest information as specified in this Disclosure Form.

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

DISCLOSURE OF FINANCIAL INFORMATION

1. Disclosure of Financial Information. The individual named below has an interest in the SUBCONTRACTOR (or its parent) in terms of ownership or distributive income share in excess of 5%, or an interest which has a value of more than 60% of the annual salary of the Governor.

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

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

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

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

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

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

**RETURN WITH SUBCONTRACT**

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

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

---

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

Yes \_\_\_ No \_\_\_

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

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

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

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

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

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

---

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

---

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

---

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

---

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

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**RETURN WITH SUBCONTRACT**

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

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

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

**3 Communication Disclosure.**

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

Name and address of person(s): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**RETURN WITH SUBCONTRACT**

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

Name of person(s): \_\_\_\_\_

Nature of disclosure: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**APPLICABLE STATEMENT**

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

Completed by:  \_\_\_\_\_ Date \_\_\_\_\_  
Signature of Individual or Authorized Officer

**NOT APPLICABLE STATEMENT**

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

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

\_\_\_\_\_ Date \_\_\_\_\_  
Signature of Authorized Officer

RETURN WITH SUBCONTRACT

ILLINOIS DEPARTMENT OF TRANSPORTATION

Form B
Subcontractor: Other Contracts & Financial Related Information Disclosure

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

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

DISCLOSURE OF OTHER CONTRACTS, SUBCONTRACTS, AND PROCUREMENT RELATED INFORMATION

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

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

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

THE FOLLOWING STATEMENT MUST BE CHECKED

Signature box with fields for Signature of Authorized Officer and Date

OWNERSHIP CERTIFICATION

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

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

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



## NOTICE TO BIDDERS

- 1. TIME AND PLACE OF OPENING BIDS.** Sealed proposals for the improvement described herein will be received by the Department of Transportation. Electronic bids are to be submitted to the electronic bidding system (ics-Integrated Contractors Exchange). Paper-based bids are to be submitted to the Chief Procurement Officer for the Department of Transportation in care of the Chief Contracts Official at the Harry R. Hanley Building, 2300 South Dirksen Parkway, in Springfield, Illinois until 10:00 o'clock a.m. November 21, 2014. 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. 61A63  
LAKE County  
Section 11-00121-11-BR  
Project CMM-9003(923)  
Route FAU 187 (Washington Street)  
District 1 Construction Funds**

**Project consists of the construction of a railroad underpass to carry the Wisconsin Central Ltd. Railroad over Washington Street, the reconstruction of the roadway, retaining wall construction, storm sewers, traffic signal modifications, construction of a shoofly track, water main, sanitary sewer, pavement markings and landscaping, located between Haryan Way and Lake Street in the Village of Grayslake.**

- 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

Erica J. Borggren,  
Acting Secretary

INDEX  
FOR  
SUPPLEMENTAL SPECIFICATIONS  
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2014

This index contains a listing of SUPPLEMENTAL SPECIFICATIONS, frequently used RECURRING SPECIAL PROVISIONS, and LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS.

ERRATA Standard Specifications for Road and Bridge Construction (Adopted 1-1-12) (Revised 1-1-14)

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

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## GUIDE BRIDGE SPECIAL PROVISION INDEX/CHECK SHEET

Effective as of the: November 7, 2014 Letting

Pg #	√	File Name	Title	Effective	Revised
		GBSP 4	Polymer Modified Portland Cement Mortar	June 7, 1994	July 26, 2013
		GBSP 12	Drainage System	June 10, 1994	Jan 1, 2007
590	X	GBSP 13	High-Load Multi-Rotational Bearings	Oct 13, 1988	Oct 30, 2012
		GBSP 14	Jack and Remove Existing Bearings	April 20, 1994	Jan 1, 2007
		GBSP 15	Three Sided Precast Concrete Structure	July 12, 1994	Oct 15, 2011
		GBSP 16	Jacking Existing Superstructure	Jan 11, 1993	Jan 1, 2007
		GBSP 17	Bonded Preformed Joint Seal	July 12, 1994	Jan 1, 2007
		GBSP 18	Modular Expansion Joint	May 19, 1994	April 18, 2014
		GBSP 21	Cleaning and Painting Contact Surface Areas of Existing Steel Structures	June 30, 2003	May 18, 2011
		GBSP 25	Cleaning and Painting Existing Steel Structures	Oct 2, 2001	April 19, 2012
		GBSP 26	Containment and Disposal of Lead Paint Cleaning Residues	Oct 2, 2001	April 30, 2010
		GBSP 28	Deck Slab Repair	May 15, 1995	Oct 15, 2011
		GBSP 29	Bridge Deck Microsilica Concrete Overlay	May 15, 1995	Oct 30, 2012
		GBSP 30	Bridge Deck Latex Concrete Overlay	May 15, 1995	Jan 18, 2011
		GBSP 31	Bridge Deck High-Reactivity Metakaolin (HRM) Conc Overlay	Jan 21, 2000	Oct 30, 2012
		GBSP 32	Temporary Sheet Piling	Sept 2, 1994	Jan 31, 2012
		GBSP 33	Pedestrian Truss Superstructure	Jan 13, 1998	April 18, 2014
		GBSP 34	Concrete Wearing Surface	June 23, 1994	Feb 6, 2013
		GBSP 35	Silicone Bridge Joint Sealer	Aug 1, 1995	Oct 15, 2011
		GBSP 38	Mechanically Stabilized Earth Retaining Walls	Feb 3, 1999	Aug 29, 2014
		GBSP 42	Drilled Soldier Pile Retaining Wall	Sept 20, 2001	Jan 3, 2014
		GBSP 43	Driven Soldier Pile Retaining Wall	Nov 13, 2002	Jan 3, 2014
596	X	GBSP 44	Temporary Soil Retention System	Dec 30, 2002	May 11, 2009
		GBSP 45	Bridge Deck Thin Polymer Overlay	May 7, 1997	Feb 6, 2013
		GBSP 46	Geotextile Retaining Walls	Sept 19, 2003	July 26, 2013
598	X	GBSP 51	Pipe Underdrain for Structures	May 17, 2000	Jan 22, 2010
		GBSP 53	Structural Repair of Concrete	Mar 15, 2006	Aug 29, 2014
		GBSP 55	Erection of Curved Steel Structures	June 1, 2007	
		GBSP 56	Setting Piles in Rock	Nov 14, 1996	April 19, 2012
		GBSP 57	Temporary Mechanically Stabilized Earth Retaining Walls	Jan 6, 2003	Aug 29, 2014
		GBSP 59	Diamond Grinding and Surface Testing Bridge Sections	Dec 6, 2004	Jan 3, 2014
		GBSP 60	Containment and Disposal of Non-Lead Paint Cleaning Residues	Nov 25, 2004	Mar 6, 2009
		GBSP 61	Slipform Parapet	June 1, 2007	Aug 17, 2012
		GBSP 62	Concrete Deck Beams	June 13, 2008	Oct 9, 2009
		GBSP 64	Segmental Concrete Block Wall	Jan 7, 1999	Oct 30, 2012
		GBSP 65	Precast Modular Retaining Walls	Mar 19, 2001	Jan 3, 2014
		GBSP 67	Structural Assessment Reports for Contractor's Means and Methods	Mar 6, 2009	
599	X	GBSP 70	Braced Excavation	Aug 9, 1995	May 18, 2011
		GBSP 71	Aggregate Column Ground Improvement	Jan 15, 2009	Oct 15, 2011

		GBSP 72	Bridge Deck Fly Ash or GGBF Slag Concrete Overlay	Jan 18, 2011	Oct 15, 2011
		GBSP 73	Cofferdams	Oct 15, 2011	
		GBSP 74	Permanent Steel Sheet Piling (LRFD)	Jan 31, 2012	Aug 17, 2012
		GBSP 75	Bond Breaker for Prestressed Concrete Bulb-T Beams	April 19, 2012	
600	X	GBSP 76	Granular Backfill for Structures	April 19, 2012	Oct 30, 2012
		GBSP 77	Weep Hole Drains for Abutments, Wingwalls, Retaining Walls And Culverts	April 19, 2012	Oct 22, 2013
		GBSP 78	Bridge Deck Construction	Oct 22, 2013	April 18, 2014
		GBSP 79	Reserved		
		GBSP 80	Fabric Reinforced Elastomeric	Aug 29, 2014	

LIST ANY ADDITIONAL SPECIAL PROVISIONS BELOW


The following Guide Bridge Special Provisions have been incorporated into the 2012 Standard Specifications:

File Name	Title	Std Spec Location
GBSP22	Cleaning and Painting New Metal Structures	506
GBSP36	Surface Preparation and Painting Req. for Weathering Steel	506
GBSP50	Removal of Existing Non-composite Bridge Decks	501
GBSP58	Mechanical Splicers	508
GBSP63	Demolition Plans for Removal of Existing Structures	501
GBSP68	Piling	512
GBSP69	Freeze-Thaw Aggregates for Concrete Superstructures Poured on Grade	1004

The following Guide Bridge Special Provisions have been discontinued or have been superseded:

File Name	Title	Disposition:
GBSP37	Underwater Structure Excavation Protection	Replaced by GBSP73
GBSP11	Permanent Steel Sheet Piling	Replaced by GBSP74
GBSP47	High Performance Concrete Structures	Discontinued
GBSP52	Porous Granular Embankment (Special)	Replaced by GBSP76
GBSP66	Wave Equation Analysis of Piles	Discontinued



INDEX LOCAL ROADS AND STREETS SPECIAL PROVISIONS

<u>LR #</u>	<u>Pg #</u>	<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
LR SD12		<input type="checkbox"/> Slab Movement Detection Device	Nov. 11, 1984	Jan. 1, 2007
LR SD13		<input type="checkbox"/> Required Cold Milled Surface Texture	Nov. 1, 1987	Jan. 1, 2007
LR SD406		<input type="checkbox"/> <b>RESCINDED</b>		
LR 102-2		<input type="checkbox"/> Bidding Requirements and Conditions for Contract Proposals	Jan. 1, 2001	Jan. 1, 2014
LR 105	602	<input checked="" type="checkbox"/> Cooperation with Utilities	Jan. 1, 1999	Jan. 1, 2007
LR 107-2		<input type="checkbox"/> Railroad Protective Liability Insurance for Local Lettings	Mar. 1, 2005	Jan. 1, 2006
LR 107-4	605	<input checked="" type="checkbox"/> Insurance	Feb. 1, 2007	Aug. 1, 2007
LR 107-7		<input type="checkbox"/> Wages of Employees on Public Works	Jan. 1, 1999	Jan. 1, 2014
LR 108		<input type="checkbox"/> Combination Bids	Jan. 1, 1994	Mar. 1, 2005
LR 109		<input type="checkbox"/> Equipment Rental Rates	Jan. 1, 2012	
LR 212		<input type="checkbox"/> Shaping Roadway	Aug. 1, 1969	Jan. 1, 2002
LR 355-1		<input type="checkbox"/> Bituminous Stabilized Base Course, Road Mix or Traveling Plant Mix	Oct. 1, 1973	Jan. 1, 2007
LR 355-2		<input type="checkbox"/> Bituminous Stabilized Base Course, Plant Mix	Feb. 20, 1963	Jan. 1, 2007
LR 400-1		<input type="checkbox"/> Bituminous Treated Earth Surface	Jan. 1, 2007	Apr. 1, 2012
LR 400-2		<input type="checkbox"/> Bituminous Surface Plant Mix (Class B)	Jan. 1, 2008	
LR 400-3		<input type="checkbox"/> Hot In-Place Recycling (HIR) – Surface Recycling	Jan. 1, 2012	
LR 400-4		<input type="checkbox"/> Full-Depth Reclamation (FDR) with Emulsified Asphalt	Apr. 1, 2012	Jun. 1, 2012
LR 400-5		<input type="checkbox"/> Cold In-Place Recycling (CIR) With Emulsified Asphalt	Apr. 1, 2012	Jun. 1, 2012
LR 400-6		<input type="checkbox"/> Cold In Place Recycling (CIR) with Foamed Asphalt	June 1, 2012	
LR 400-7		<input type="checkbox"/> Full-Depth Reclamation (FDR) with Foamed Asphalt	June 1, 2012	
LR 402		<input type="checkbox"/> Salt Stabilized Surface Course	Feb. 20, 1963	Jan. 1, 2007
LR 403-1		<input type="checkbox"/> Surface Profile Milling of Existing, Recycled or Reclaimed Flexible Pavement	Apr. 1, 2012	Jun. 1, 2012
LR 403-2		<input type="checkbox"/> Bituminous Hot Mix Sand Seal Coat	Aug. 1, 1969	Jan. 1, 2007
LR 406	606	<input checked="" type="checkbox"/> Filling HMA Core Holes with Non-shrink Grout	Jan. 1, 2008	
LR 420		<input type="checkbox"/> PCC Pavement (Special)	May 12, 1964	Jan. 2, 2007
LR 442		<input type="checkbox"/> Bituminous Patching Mixtures for Maintenance Use	Jan. 1, 2004	Jun. 1, 2007
LR 451		<input type="checkbox"/> Crack Filling Bituminous Pavement with Fiber-Asphalt	Oct. 1, 1991	Jan. 1, 2007
LR 503-1		<input type="checkbox"/> Furnishing Class SI Concrete	Oct. 1, 1973	Jan. 1, 2002
LR 503-2		<input type="checkbox"/> Furnishing Class SI Concrete (Short Load)	Jan. 1, 1989	Jan. 1, 2002
LR 542		<input type="checkbox"/> Pipe Culverts, Type _____ (Furnished)	Sep. 1, 1964	Jan. 1, 2007
LR 663		<input type="checkbox"/> Calcium Chloride Applied	Jun. 1, 1958	Jan. 1, 2007
LR 702		<input type="checkbox"/> Construction and Maintenance Signs	Jan. 1, 2004	Jun. 1, 2007
LR 1000-1		<input type="checkbox"/> Cold In-Place Recycling (CIR) and Full Depth Reclamation (FDR) with Emulsified Asphalt Mix Design Procedures	Apr. 1, 2012	Jun. 1, 2012
LR 1000-2		<input type="checkbox"/> Cold In-Place Recycling (CIR) and Full Depth Reclamation (FDR) with Foamed Asphalt Mix Design Procedures	June 1, 2012	
LR 1004		<input type="checkbox"/> Coarse Aggregate for Bituminous Surface Treatment	Jan. 1, 2002	Jan. 1, 2007
LR 1030		<input type="checkbox"/> Growth Curve	Mar. 1, 2008	Jan. 1, 2010
LR 1032-1		<input type="checkbox"/> Emulsified Asphalts	Jan. 1, 2007	Feb. 7, 2008
LR 1102		<input type="checkbox"/> Road Mix or Traveling Plan Mix Equipment	Jan. 1, 2007	

BDE SPECIAL PROVISIONS  
For the November 21, 2014 Letting

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

<u>File Name</u>	<u>Pg.</u>		<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
80240			Above Grade Inlet Protection	July 1, 2009	Jan. 1, 2012
80099			Accessible Pedestrian Signals (APS)	April 1, 2003	Jan. 1, 2014
80274			Aggregate Subgrade Improvement	April 1, 2012	Jan. 1, 2013
80192			Automated Flagger Assistance Device	Jan. 1, 2008	
80173			Bituminous Materials Cost Adjustments	Nov. 2, 2006	Aug. 1, 2013
80241			Bridge Demolition Debris	July 1, 2009	
50261			Building Removal-Case I (Non-Friable and Friable Asbestos)	Sept. 1, 1990	April 1, 2010
50481			Building Removal-Case II (Non-Friable Asbestos)	Sept. 1, 1990	April 1, 2010
50491			Building Removal-Case III (Friable Asbestos)	Sept. 1, 1990	April 1, 2010
50531			Building Removal-Case IV (No Asbestos)	Sept. 1, 1990	April 1, 2010
80292			Coarse Aggregate in Bridge Approach Slabs/Footings	April 1, 2012	April 1, 2013
80310	607	X	Coated Galvanized Steel Conduit	Jan. 1, 2013	Aug. 1, 2014
80341			Coilable Nonmetallic Conduit	Aug. 1, 2014	
80198			Completion Date (via calendar days)	April 1, 2008	
80199			Completion Date (via calendar days) Plus Working Days	April 1, 2008	
80293			Concrete Box Culverts with Skews > 30 Degrees and Design Fills ≤ 5 Feet	April 1, 2012	April 1, 2014
80294			Concrete Box Culverts with Skews ≤ 30 Degrees Regardless of Design Fill and Skews > 30 Degrees with Design Fills > 5 Feet	April 1, 2012	April 1, 2014
80311			Concrete End Sections for Pipe Culverts	Jan. 1, 2013	
80334	609	X	Concrete Gutter, Curb, Median, and Paved Ditch	April 1, 2014	Aug. 1, 2014
80277			Concrete Mix Design – Department Provided	Jan. 1, 2012	Jan. 1, 2014
* 80261	610	X	Construction Air Quality – Diesel Retrofit	June 1, 2010	Nov. 1, 2014
80335	613	X	Contract Claims	April 1, 2014	
80029	614	X	Disadvantaged Business Enterprise Participation	Sept. 1, 2000	Aug. 2, 2011
* 80265	624	X	Friction Aggregate	Jan. 1, 2011	Nov. 1, 2014
80229			Fuel Cost Adjustment	April 1, 2009	July 1, 2009
80329			Glare Screen	Jan. 1, 2014	
80303	628	X	Granular Materials	Nov. 1, 2012	
80304			Grooving for Recessed Pavement Markings	Nov. 1, 2012	Aug. 1, 2014
80246	629	X	Hot-Mix Asphalt – Density Testing of Longitudinal Joints	Jan. 1, 2010	April 1, 2012
* 80322			Hot-Mix Asphalt – Mixture Design Composition and Volumetric Requirements	Nov. 1, 2013	Nov. 1, 2014
* 80323			Hot-Mix Asphalt – Mixture Design Verification and Production	Nov. 1, 2013	Nov. 1, 2014
* 80347			Hot-Mix Asphalt – Pay for Performance Using Percent Within Limits – Jobsite Sampling	Nov. 1, 2014	
* 80348	631	X	Hot-Mix Asphalt – Prime Coat	Nov. 1, 2014	
80315			Insertion Lining of Culverts	Jan. 1, 2013	Nov. 1, 2013
80336			Longitudinal Joint and Crack Patching	April 1, 2014	
* 80324	636	X	LRFD Pipe Culvert Burial Tables	Nov. 1, 2013	Nov. 1, 2014
* 80325	656	X	LRFD Storm Sewer Burial Tables	Nov. 1, 2013	Nov. 1, 2014
80045			Material Transfer Device	June 15, 1999	Aug. 1, 2014
80342	666	X	Mechanical Side Tie Bar Inserter	Aug. 1, 2014	
80165			Moisture Cured Urethane Paint System	Nov. 1, 2006	Jan. 1, 2010
80337			Paved Shoulder Removal	April 1, 2014	
* 80349			Pavement Marking Blackout Tape	Nov. 1, 2014	
80330			Pavement Marking for Bike Symbol	Jan. 1, 2014	
80298			Pavement Marking Tape Type IV	April 1, 2012	

<u>File Name</u>	<u>Pg.</u>		<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
80254			Pavement Patching	Jan. 1, 2010	
80331	668	X	Payrolls and Payroll Records	Jan. 1, 2014	
80332			Portland Cement Concrete – Curing of Abutments and Piers	Jan. 1, 2014	
80326	670	X	Portland Cement Concrete Equipment	Nov. 1, 2013	
80338			Portland Cement Concrete Partial Depth Hot-Mix Asphalt Patching	April 1, 2014	
80343	671	X	Precast Concrete Handhole	Aug. 1, 2014	
80300			Preformed Plastic Pavement Marking Type D - Inlaid	April 1, 2012	
80328	672	X	Progress Payments	Nov. 2, 2013	
80281	673	X	Quality Control/Quality Assurance of Concrete Mixes	Jan. 1, 2012	Jan. 1, 2014
34261			Railroad Protective Liability Insurance	Dec. 1, 1986	Jan. 1, 2006
80157	674	X	Railroad Protective Liability Insurance (5 and 10)	Jan. 1, 2006	
80306			Reclaimed Asphalt Pavement (RAP) and Reclaimed Asphalt Shingles (RAS)	Nov. 1, 2012	April 1, 2014
* 80350			Retroreflective Sheeting for Highway Signs	Nov. 1, 2014	
80327	676	X	Reinforcement bars	Nov. 1, 2013	
80283	678	X	Removal and Disposal of Regulated Substances	Jan. 1, 2012	Nov. 2, 2012
80319	682	X	Removal and Disposal of Surplus Materials	Nov. 2, 2012	
80344			Rigid Metal Conduit	Aug. 1, 2014	
80307			Seeding	Nov. 1, 2012	
80340			Speed Display Trailer	April 2, 2014	
80339			Stabilized Subbase	April 1, 2014	
80127			Steel Cost Adjustment	April 2, 2004	April 1, 2009
80317			Surface Testing of Hot-Mix Asphalt Overlays	Jan. 1, 2013	
80301			Tracking the Use of Pesticides	Aug. 1, 2012	
80333			Traffic Control Setup and Removal Freeway/Expressway	Jan. 1, 2014	
20338	683	X	Training Special Provisions	Oct. 15, 1975	
80318			Traversable Pipe Grate	Jan. 1, 2013	April 1, 2014
80345			Underpass Luminaire	Aug. 1, 2014	
80346			Waterway Obstruction Warning Luminaire	Aug. 1, 2014	
* 80288	686	X	Warm Mix Asphalt	Jan. 1, 2012	Nov. 1, 2014
80302	688	X	Weekly DBE Trucking Reports	June 2, 2012	
80289			Wet Reflective Thermoplastic Pavement Marking	Jan. 1, 2012	
80071			Working Days	Jan. 1, 2002	

The following special provisions are in the 2014 Supplemental Specifications and Recurring Special Provisions:

<u>File Name</u>	<u>Special Provision Title</u>	<u>New Location</u>	<u>Effective</u>	<u>Revised</u>
80309	Anchor Bolts	Articles 1006.09, 1070.01, and 1070.03	Jan. 1, 2013	
80276	Bridge Relief Joint Sealer	Article 503.19 and Sections 588 and 589	Jan. 1, 2012	Aug. 1, 2012
80312	Drain Pipe, Tile, Drainage Mat, and Wall Drain	Article 101.01, 1040.03, and 1040.04	Jan. 1, 2013	
80313	Fabric Bearing Pads	Article 1082.01	Jan. 1, 2013	
80169	High Tension Cable Median Barrier	Section 644 and Article 1106.02	Jan. 1, 2007	Jan. 1, 2013
80320	Liquidated Damages	Article 108.09	April 1, 2013	
80297	Modified Urethane Pavement Marking	Section 780, Articles 1095.09 and 1105.04	April 1, 2012	
80253	Moveable Traffic Barrier	Section 707 and Article 1106.02	Jan. 1, 2010	Jan. 1, 2013
80231	Pavement Marking Removal	Recurring CS #33	April 1, 2009	
80321	Pavement Removal	Article 440.07	April 1, 2013	
80022	Payments to Subcontractors	Article 109.11	June 1, 2000	Jan. 1, 2006

<u>File Name</u>	<u>Special Provision Title</u>	<u>New Location</u>	<u>Effective</u>	<u>Revised</u>
80316	Placing and Consolidating Concrete	Articles 503.06, 503.07, and 516.12	Jan. 1, 2013	
80278	Planting Woody Plants	Section 253 and Article 1081.01	Jan. 1, 2012	Aug. 1, 2012
80305	Polyurea Pavement Markings	Article 780.14	Nov. 1, 2012	Jan. 1, 2013
80279	Portland Cement Concrete	Sections 312, 503, 1003, 1004, 1019, and 1020	Jan. 1, 2012	Nov. 1, 2013
80218	Preventive Maintenance – Bituminous Surface Treatment	Recurring CS #34	Jan. 1, 2009	April 1, 2012
80219	Preventive Maintenance – Cape Seal	Recurring CS #35	Jan. 1, 2009	April 1, 2012
80220	Preventive Maintenance – Micro Surfacing	Recurring CS #36	Jan. 1, 2009	April 1, 2012
80221	Preventive Maintenance – Slurry Seal	Recurring CS #37	Jan. 1, 2009	April 1, 2012
80224	Restoring Bridge Approach Pavements Using High-Density Foam	Recurring CS #39	Jan. 1, 2009	Jan. 1, 2012
80255	Stone Matrix Asphalt	Sections 406, 1003, 1004, 1030, and 1011	Jan. 1, 2010	Aug. 1, 2013
80143	Subcontractor Mobilization Payments	Article 109.12	April 2, 2005	April 1, 2011
80308	Synthetic Fibers in Concrete Gutter, Curb, Median and Paved Ditch	Articles 606.02 and 606.11	Nov. 1, 2012	
80286	Temporary Erosion and Sediment Control	Articles 280.04 and 280.08	Jan. 1, 2012	
80225	Temporary Raised Pavement Marker	Recurring CS #38	Jan. 1, 2009	
80256	Temporary Water Filled Barrier	Section 708 and Article 1106.02	Jan. 1, 2010	Jan. 1, 2013
80273	Traffic Control Deficiency Deduction	Article 105.03	Aug. 1, 2011	
80270	Utility Coordination and Conflicts	Articles 105.07, 107.19, 107.31, 107.37, 107.38, 107.39 and 107.40	April 1, 2011	Jan. 1, 2012

The following special provisions require additional information from the designer. The Special Provisions are:

- Bridge Demolition Debris
- Building Removal-Case I
- Building Removal-Case II
- Building Removal-Case III
- Building Removal-Case IV
- Completion Date
- Completion Date Plus Working Days
- DBE Participation
- Material Transfer Device
- Railroad Protective Liability Insurance
- Training Special Provisions
- Working Days

## STATE OF ILLINOIS SPECIAL PROVISIONS

The following Special Provisions supplement the specifications listed in the table below, which apply to and govern the proposed improvement designated as Lake County Section **11-00121-11-BR**, and in case of conflict with any part or parts of said specifications, the said Special Provisions shall take precedence and govern.

SPECIFICATION	ADOPTED/DATED
<b>Standard Specifications for Road and Bridge Construction</b>	January 1, 2012
<b>Manual on Uniform Traffic Control Devices for Streets and Highways</b> Illinois Supplement	2009 Edition March 2010
<b>Supplemental Specifications and Recurring Special Provisions</b> (indicated on the Check Sheet included herein)	January 1, 2014
<b>Standard Specifications for Water &amp; Sewer main Construction in Illinois</b>	July 2009

### **LOCATION OF IMPROVEMENT**

This project begins on Washington Street (FAU 187) at Haryan Way and continues in an eastward direction to Lake Street. The project is located in the Village of Grayslake. The gross and net length of the project is 1,994.47 feet (0.38 miles).

### **DESCRIPTION OF IMPROVEMENT**

The work to be performed under the Contract includes widening Washington Street and constructing a railroad underpass. Work shall consist of pavement removal; concrete curb and gutter removal and replacement; pavement reconstruction, including roadway widening and channelized intersections; traffic signal modification; grading; storm sewer and drainage structure reconstruction; maintenance of traffic; erosion control; installation of pavement markings; landscaping; culvert extension; retaining wall construction; railroad shoofly construction; roadway run-around construction; railroad bridge construction; and utility coordination, relocation and adjustments and all incidental and collateral work necessary to complete the project as shown on the plans and as described herein.

**ARTICLE 105.09 SURVEY CONTROL POINTS (LCDOT)**

Effective: January 1, 2007

Revised: June 6, 2014

The Contractor shall furnish the Engineer with the materials required to establish survey control points according to Article 105.09 of the "Standard Specifications" and the following:

**Paint:** *The Contractor shall furnish, at their expense, white, pink or purple pavement marking paint in aerosol cans, for use by the Engineer. The paint shall last up to 6 months; be non-freezing, be functional to 14°F; and be fully operational in an inverted position.*

*The Contractor and subcontractors shall only use white, pink or purple colors for their own markings. At no time will the Contractor use any of the J.U.L.I.E. utility colors listed in Article 107.31 of the "Standard Specifications".*

**Hubs:** *The Contractor shall furnish, at their expense, hubs for use by the Engineer according to the following:*

1. *Shall be 1 3/8" x 7/8" x 18" (actual dimension).*
2. *Shall be furnished in securely banded (on each end) bundles of 25 pieces.*
3. *The material shall be kiln dried Douglas fir, oak or maple and surfaced on the 2 larger sides and without splits, pitch pockets, wane, knots or decayed wood.*
4. *The tapered end on each hub shall be pencil point tapered.*

**Lath:** *The Contractor shall furnish, at their expense, lath for use by the Engineer according to the following:*

1. *Shall be 1 1/8" x 1/2" x 48" (actual dimension).*
2. *Shall be furnished in securely banded (on each end) bundles of 50 pieces.*
3. *The material shall be kiln dried Douglas fir, oak or maple and surfaced on the 2 larger sides and without splits, pitch pockets, wane, knots or decayed wood.*
4. *The tapered end may be saw-cut tapered or pencil tapered.*

**PROTECTION OF EXISTING DRAINAGE FACILITIES DURING CONSTRUCTION (LCDOT)**

Effective: May 19, 2014

All existing drainage structures shall be kept free of debris resulting from construction operations. All work and material necessary to prevent accumulation of debris in the drainage structures will be considered as included in the unit bid prices of the inlet protection, inlet filters and other temporary erosion control measures. Any debris in the drainage structures resulting from construction operations shall be removed at the Contractor's own expense, and no extra compensation will be allowed.

Should reconstruction or adjustment of a drainage structure be required by the Engineer in the field, the necessary work and payment shall be done according to Section 602 and Article 104.02 respectively of the "Standard Specifications".

During construction, if the Contractor's forces encounter or otherwise becomes aware of any sewers, underdrains or field drains within the right-of-way other than those shown on the plans, they shall inform the Engineer. The Engineer shall direct the work necessary to maintain or replace the facilities in service, and to protect them from damage during construction if maintained. Existing facilities to be maintained that are damaged because of non-compliance with this provision shall be replaced at the Contractor's own expense. Should the Engineer direct the replacement of a facility, the necessary work and payment shall be done in accordance with Section 550, Section 601 and Article 104.02 respectively of the "Standard Specifications".

**ARTICLE 107.09 PUBLIC CONVENIENCE AND SAFETY (LCDOT)**

Effective: January 1, 2007

Revised: June 4, 2014

The Contractor shall limit public inconveniences safety conflicts according to Article 107.09 of the "Standard Specifications" and the following:

**Keeping Roads Open to Traffic:** *With the exceptions of closures and detours as noted in the plans and specifications, all roads shall remain open to traffic. The Contractor may close one (through traffic) lane because of construction only between the hours of 9:00 AM and 3:00 PM. The Contractor shall maintain one-way traffic during these restricted hours on two lane highways with the use of signs and flaggers as shown on the Traffic Control Standard. On multi-lane highways the Contractor shall maintain at least one (through traffic) lane in each direction with the use of signs, barricades, and arrow boards as shown on the Traffic Control Standards. All lanes of traffic will be maintained between 3:00 PM and 9:00 AM and when no construction activities are being carried out.*

*The restricted lane closure time may be adjusted by the Resident Engineer. The Contractor shall provide a start and end time and a procedure plan 48 hours prior to the lane(s) to be closed. The Resident Engineer will notify the Contractor 24 hours in advance with the decision.*

*If the Contractor fails to provide notification or disregards the decision by the Resident Engineer the Traffic Control Deficiency Charge will be applied as stated in the Special Provisions for Traffic Control and Protection.*

**Safety and Convenience:** *The Contractor shall maintain entrances along the proposed improvement. Interference with traffic movements and inconvenience to owners of abutting property and the public shall be kept to a minimum. Any delays or inconveniences caused by the Contractor, by complying with these requirements shall be considered as included in the unit bid prices of the contract and no additional compensation will be allowed.*

*Contractors shall plan their work so that there will be no open holes in the pavement and that all barricades will be removed from the roadway during non-working hours, except where required for public safety.*

*Steel road plates may be used as temporary cover over excavations. Anytime steel road plates are in the roadway these requirements apply:*

- *The steel road plate shall sit flat on the pavement and be free of defects and warping*
- *It shall be shimmed with a non-asphaltic material to prevent vertical movement*
- *If the steel road plate is not under constant surveillance, it shall be pinned to prevent horizontal movement by a minimum of 6 pins; 4 pins predrilled into the corners of the plates and 1 pin predrilled into each side parallel to the trench. Pins shall be drilled 3 inches into the pavement and not protrude above the pavement surface*



- *The steel road plate shall be at least 1 inch thick and large enough to allow a minimum of 1 foot of bearing on each side of the trench*
- *A one foot wide HMA surface course ramp shall be placed around the perimeter of the plate*
- *Multiple steel road plates shall be tack welded together to prevent separation if they are not under constant surveillance*
- *Appropriate advanced warning signs (W8-24 "STEEL PLATE AHEAD" and W8-1 "BUMP") are required*

*Steel road plates may be left in place overnight, in emergency situations and with the concurrence of the Engineer. Steel road plates left in place overnight shall be attached to the roadway by a minimum of 6 pins; 4 pins predrilled into the corners of the plates and 1 pin predrilled into each side parallel to the trench. Pins shall be drilled 3 inches into the pavement and not protrude above the pavement surface.*

*Steel road plates left in-place for more than 72 hours, shall also be:*

- *Recessed into the street surface the thickness of the steel road plate with no difference in elevation with the existing surface*
- *Secured in-place to prevent horizontal movement with HMA surface course between the existing pavement vertical edge and the steel road plate*

*Road plates shall not be used from November 15<sup>th</sup> to April 15<sup>th</sup> without approval from the Engineer.*

**ARTICLE 107.20 PROTECTION AND RESTORATION OF PROPERTY (LCDOT)**

Effective: January 1, 2007

Revised: May 19, 2014

The Contractor shall protect and restore property according to Article 107.20 of the "Standard Specifications" and the following:

**Trees and Shrubs:** *Extra care shall be exercised when operating equipment around trees or shrubs. Injured branches or roots shall be pruned in a manner satisfactory to the Engineer and shall be painted where the cut was made. Roots exposed during excavating operations shall be neatly pruned and covered with topsoil. This work shall be done as soon as possible and shall be considered as included in the unit bid price(s) of the various excavation (e.g. Earth Excavation, Excavating and Grading Existing Shoulder, Structure Excavation, Furnished Excavation etc...) and excavation related (e.g. Storm Sewers, Grading and Shaping Ditches, Concrete Foundations, etc...) work items shown in the Summary of Quantities. No additional compensation will be allowed this work.*

**ARTICLE 107.23 PROTECTION OF STREAMS, LAKES, RESERVOIRS, NATURAL AREAS, WETLANDS, PRAIRIE AREAS, SAVANNAHS, AND ENDANGERED AND THREATENED SPECIES (LCDOT)**

Effective: April 1, 2008  
Revised: May 19, 2014

**CONCRETE WASHOUT FACILITY**

**Description:** The Contractor shall take sufficient precautions to prevent pollution of streams, lakes, reservoirs, and wetlands with fuels, oils, bitumens, calcium chloride, or other harmful materials according to Article 107.23 of the "Standard Specifications".

**General:** *To prevent pollution by residual concrete and/or the by product of washing out the concrete trucks, concrete washout facilities shall be constructed and maintained on any project which includes cast-in-place concrete items. The concrete washout shall be constructed, maintained, and removed according to this special provision and LCDOT standard LC4202 included in these plans. Concrete washout facilities shall be required on all projects regardless of the need for NPDES permitting. On projects requiring NPDES permitting, concrete washout facilities shall also be addressed in the Storm Water Pollution Prevention Plan.*

*The concrete washout facility shall be constructed on the job site according to LC4202. The Contractor may elect to use a pre-fabricated portable concrete washout structure. The Contractor shall submit a plan for the concrete washout facility, to the Engineer for approval, a minimum of 10 calendar days before the first concrete pour. The working concrete washout facility shall be in place before any delivery of concrete to the site. The Contractor shall ensure that all concrete washout activities are limited to the designated area.*

*The concrete washout facility shall be located no closer than 50 feet from any environmentally sensitive areas, such as water bodies, wetlands, and/or other areas indicated on the plans. Adequate signage shall be placed at the washout facility and elsewhere as necessary to clearly indicate the location of the concrete washout facility to the operators of concrete trucks.*

*The concrete washout facility shall be adequately sized to fully contain the concrete washout needs of the project. The contents of the concrete washout facility shall not exceed 75% of the facility capacity. Once the 75% capacity is reached, concrete placement shall be discontinued until the facility is cleaned out. Hardened concrete shall be removed and properly disposed of outside the right-of-way. Slurry shall be allowed to evaporate, or shall be removed and properly disposed of outside the right-of-way. The Contractor shall immediately replace damaged basin liners or other washout facility components to prevent leakage of concrete waste from the washout facility. Concrete washout facilities shall be inspected by the Contractor after each use. Any and all spills shall be reported to the Engineer and cleaned up immediately. The Contractor shall remove the concrete washout facility when it is no longer needed.*

**Basis of Payment:** This work will not be paid for separately, but shall be included in unit bid prices of the various concrete work items(e.g. portland cement concrete pavement; portland cement concrete sidewalk, and combination concrete curb and gutter etc...), shown in the Summary of Quantities.

**ARTICLE 107.27 INSURANCE (LCDOT)**

Effective: January 1, 2007

Revised: May 19, 2014

The Contractor shall obtain and thereafter keep in force insurance according to Article 107.27 of the "Standard Specifications" and the following:

The minimum Employers Liability limits listed in paragraph 107.27(a)(2) shall be increased to the following limits:

- (2) Employers Liability
  - a. Each Accident \$1,000,000
  - b. Disease-policy limit \$1,000,000
  - c. Disease-each employee \$1,000,000

The minimum Commercial General Liability limits listed in paragraph 107.27(b) shall be increased to the following limits along with the addition of a Personal and Advertising Injury Limit:

- (1) General Aggregate Limit \$4,000,000
- (2) Products-Completed Operations Aggregate Limit \$4,000,000
- (3) Personal and Advertising Injury Limit \$1,000,000
- (4) Each Occurrence Limit \$2,000,000

The minimum Commercial Automobile Liability limit listed in paragraph 107.27(c) shall remain at:

Bodily Injury & Property Damage  
Liability Limit Each Occurrence \$1,000,000

In addition to the Department, its officers, and employees, coverage shall be provided for Lake County, its agents, officers and employees, named as additional insured under ISO (Insurance Services Office) additional insured endorsement CG 20 26, edition date 07/04 or its equivalent. Coverage shall be provided for Lake County, its officers, agents and employees, all members of Boards, Commissions, Committees, Trustees and Organizations of the County, all volunteers and members of volunteer organizations and other non-paid personnel, including college and high school interns, while acting on behalf of the County. The Contractor's insurance shall be primary and non-contributory.

**ARTICLE 107.29 OPENING OF SECTION OF HIGHWAY TO TRAFFIC (LCDOT)**

Effective January 1, 2007

Revised: May 19, 2014

Work under construction shall be opened to traffic according to Article 107.29 of the "Standard Specifications" and the following:

*The Contractor shall work expeditiously to open traffic lanes closed due to roadwork. The Engineer shall be the sole judge of when a lane is ready to be opened to traffic. The opening of a lane to traffic shall be in accordance to Section 107.29 of the "Standard Specifications".*

*Roadwork requiring a closure of a lane, which has been opened previously to traffic, will be allowed at the discretion of the Engineer and under the following conditions:*

- 1. The lane closure shall only be in effect while workers are present in or near the closed lane.*
- 2. The closed lane will be reopened to traffic at the end of the workday.*
- 3. All traffic control devices pertaining to the lane closure shall be removed from the roadway at the end of the workday.*

**RAILROAD FLAGGING (WCL RR)**

Description. This work shall be performed as in accordance with Sections 107.12 and 109.05 of the Standard Specifications.

General Requirements. The flagging costs incurred for the work associated at the location of the Washington Street and the Wisconsin Central Ltd. (WCL) grade crossing will be reimbursed by IDOT in accordance with Section 109.05 of the Standard Specifications. The Contractor is responsible for prepaying the CN in advance for flagging services provided. The Contractor shall deposit the cost of flagging services for three hundred (300) days with the CN. If the Contractor uses less than 300 days, then the Contractor will be charged for the days used and the balance will be reimbursed back to the Contractor. The Contractor will then be reimbursed by IDOT for the actual number of flagging days used. The Contractor is required to conduct operations at all times in full compliance with the rules, regulations and requirements of the WCL Special Provisions contained in the Contract Specifications and as described below.

The Contractor shall give thirty (30) days advance written notice to the Engineering Superintendent of the Railroad or his authorized representative prior to commencement of any construction work on the Improvement affecting the railroad property. The Contractor shall notify the Railroad sufficiently in advance of when the protective services are required. The Contractor shall make every effort to notify the Railroad in advance if a previously requested flagger will not be needed for any reason. Any costs for flagging protection provided by the Railroad at the Contractor's request for those days when the Contractor does not work shall be borne by the Contractor.

The contact person for the Railroad is:

Railroad: WCL  
Name: Paul Chojenski  
Address: 17641 South Ashland Avenue  
Homewood, IL 60430  
Phone: (708) 332-3557

In addition, the Contractor shall provide, and be paid for, Railroad Protective Liability Insurance according to Article 107.11 of the "Standard Specifications", and BDE Special Provision for Railroad Protective Liability Insurance (5 and 10), included herein.

Basis of Payment. RAILROAD FLAGGING (WCL RR) will be paid for according to Article 109.05 of the Standard Specifications.

Railroad Right of Entry will not be paid for separately. Permit costs are the responsibility of the contractor, at no cost to the Department, per Article 107.04 of the Standard Specifications.

**COMPLETION DATE PLUS WORKING DAYS**

*It is the intent of the County that this project be constructed in an orderly and timely manner. Toward this end, the Contractor shall take special note of the provisions of Article 105.06, Article 108.01 paragraph 2, and Article 108.02 of the "Standard Specifications" which shall be adhered to.*

*The Contractor shall coordinate all work between their forces and subcontractors to enable completion within the allotted working days.*

It is understood that TIME IS OF THE ESSENCE IN THIS CONTRACT, and the Contractor agrees to begin actual work covered by this contract after notification by the County to commence work and to prosecute the same with all due diligence so as to complete the entire work by the specific completion date and the following interim dates for specific items of work. It may be necessary for the Contractor to work longer hours, use additional crews and/or work during weekends in order to complete work within the required time limit. The Contractor shall submit a Critical Path Method (CPM) Progress Schedule at the preconstruction meeting for the Engineer's approval before work can be started.

The Contractor will not be allowed any extra compensation for working longer hours or using extra Shifts, working on weekends or during holidays, etc., to meet the specified completion date.

<u>MILESTONE</u>	<u>INTERIM COMPLETION DATE FOR MILESTONE</u>
Milestone 1	April 30, 2015
Milestone 2	June 8, 2015
Milestone 3	May 16, 2016
Milestone 4	November 23, 2016 + 15 Working Days

<u>MILESTONE</u>	<u>DESCRIPTION OF WORK FOR MILESTONE</u>
Milestone 1	Connection of proposed JAWA water main to existing water main. Connection to existing water main will not be permitted during peak flow months of May through September. Refer to PRESTRESSED CONCRETE CYLINDER PIPE AND FITTINGS special provision.
Milestone 2	End of MOT Stage 1. Vehicular traffic must be on the roadway run-around, temporary rail crossings constructed and signals installed
Milestone 3	Start of MOT Stage 2C. Retaining wall on south side of Washington west of bridge constructed. Track raise completed. Roadway runaround profile adjusted. Railroad running on final railroad alignment. Schedule met for bridge and rail construction

Milestone 4                      End of MOT Stage 3. Completion of project with the exception of final landscaping and remaining punch list items. All proposed lanes open to traffic.

Should the Contractor fail to complete the work for any of the Milestones on or before the interim completion date as specified in this Special Provision, or within such extended time as may have been allowed by the County, the Contractor shall be liable to the County in the amount of \$6,775, not as a penalty but as liquidated damages, for each calendar day or a 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 County's actual loss, in the event of delay, cannot be predetermined, would be difficult to ascertain, and a matter of argument and unprofitable litigation. This said mode is an equitable rule for measurement of the County's actual loss and fairly takes into account the loss of use of the roadway if the project is delayed in completion. The County 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.

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(s) and the number of working days.

The Village of Grayslake allows the work hours by Village ordinance as shown below:

Monday through Friday:	7:00am to 6:00pm
Saturday:	8:30am to 6:00pm
Sunday:	No Work (or permission granted by Village Board)



## **IDOT DISTRICT 1 SPECIAL PROVISIONS**

### **MAINTENANCE OF ROADWAYS**

Effective: September 30, 1985

Revised: November 1, 1996

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

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

**AGGREGATE SURFACE COURSE FOR TEMPORARY ACCESS**

Effective: April 1, 2001  
Revised: January 2, 2007

Revise Article 402.10 of the Standard Specifications to read:

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

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

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

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

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

Add the following to Article 402.12 of the Standard Specifications:

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

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

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

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

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

**AGGREGATE SUBGRADE IMPROVEMENT (D-1)**

Effective: February 22, 2012

Revised: November 1, 2014

Add the following Section to the Standard Specifications:

**“SECTION 303. AGGREGATE SUBGRADE IMPROVEMENT**

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

**303.02 Materials.** Materials shall be according to the following.

Item	Article/Section
(a) Coarse Aggregate .....	1004
(b) Reclaimed Asphalt Pavement (RAP) (Notes 1, 2 and 3) .....	1031

Note 1. Crushed RAP, from either full depth or single lift removal, may be mechanically blended with aggregate gradations CS 01 or CS 02 but shall not exceed 40 percent of the total product. The top size of the Coarse RAP shall be less than 4 in. (100 mm) and well graded.

Note 2. RAP having 100 percent passing the 1 1/2 in. (37.5 mm) sieve and being well graded, may be used as capping aggregate in the top 3 in. (75 mm) when aggregate gradations CS 01 or CS 02 are used in lower lifts. When RAP is blended with any of the coarse aggregates, the blending shall be done with mechanically calibrated feeders.

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

**303.03 Equipment.** The vibratory machine shall be according to Article 1101.01, or as approved by the Engineer.

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

**303.05 Placing Aggregate.** The maximum nominal lift thickness of aggregate gradations CS 01 or CS 02 shall be 24 in. (600 mm).

**303.06 Capping Aggregate.** The top surface of the aggregate subgrade shall consist of a minimum 3 in. (75 mm) of aggregate gradations CA 06 or CA 10. When Reclaimed Asphalt Pavement (RAP) is used, it shall be crushed and screened where 100 percent is passing the 1 1/2 in. (37.5 mm) sieve and being well graded. RAP that has been fractionated to size will not be permitted for use in capping. Capping aggregate will not be required when the aggregate subgrade improvement is used as a cubic yard pay item for undercut applications. When RAP is blended with any of the coarse aggregates, the blending shall be done with mechanically calibrated feeders.

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

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

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

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

Add the following to Section 1004 of the Standard Specifications:

**1004.06 Coarse Aggregate for Aggregate Subgrade Improvement.** The aggregate shall be according to Article 1004.01 and the following.

- (a) Description. The coarse aggregate shall be crushed gravel, crushed stone, or crushed concrete.
- (b) Quality. The coarse aggregate shall consist of sound durable particles reasonably free of deleterious materials.
- (c) Gradation.
  - (1) The coarse aggregate gradation for total subgrade thicknesses of 12 in. (300 mm) or greater shall be CS 01 or CS 02.

COARSE AGGREGATE SUBGRADE GRADATIONS					
Sieve Size and Percent Passing					
Grad No.	8"	6"	4"	2"	#4
CS 01	100	97 ± 3	90 ± 10	45 ± 25	20 ± 20
CS 02		100	80 ± 10	25 ± 15	

COARSE AGGREGATE SUBGRADE GRADATIONS (Metric)					
Sieve Size and Percent Passing					
Grad No.	200 mm	150 mm	100 mm	50 mm	4.75 mm
CS 01	100	97 ± 3	90 ± 10	45 ± 25	20 ± 20
CS 02		100	80 ± 10	25 ± 15	

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

**COARSE AGGREGATE FOR BACKFILL, TRENCH BACKFILL AND BEDDING (D-1)**

Effective: November 1, 2011

Revised: November 1, 2013

This work shall be according to Section 1004.05 of the Standard Specifications except for the following:

Reclaimed Asphalt Pavement (RAP) maybe blended with gravel, crushed gravel, crushed stone crushed concrete, crushed slag, chats, crushed sand stone or wet bottom boiler slag. The RAP used shall be according to the current Bureau of Materials and Physical Research Policy Memorandum, "Reclaimed Asphalt Pavement (RAP) for Aggregate Applications". The RAP shall be uniformly graded and shall pass the 1.0 in. (25 mm) screen. When RAP is blended with any of the coarse aggregate listed above, the blending shall be done mechanically with calibrated feeders. The feeders shall have an accuracy of  $\pm 2.0$  percent of the actual quantity of material delivered. The final blended product shall not contain more than 40 percent by weight RAP.

The coarse aggregate listed above shall meet CA 6 and CA 10 gradations prior to being blended with the processed and uniformly graded RAP. Gradation deleterious count shall not exceed 10% of total RAP and 5% of other by total weight.

## **EMBANKMENT I**

Effective: March 1, 2011  
Revised: November 1, 2013

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

Material. All material shall be approved by the District Geotechnical Engineer. The proposed material must meet the following requirements.

- a) The laboratory Standard Dry Density shall be a minimum of 90 lb/cu ft (1450 kg/cu m) when determined according to AASHTO T 99 (Method C).
- b) The organic content shall be less than ten percent determined according to AASHTO T 194 (Wet Combustion).
- c) Soils which demonstrate the following properties shall be restricted to the interior of the embankment and shall be covered on both the sides and top of the embankment by a minimum of 3 ft (900 mm) of soil not considered detrimental in terms of erosion potential or excess volume change.
  - 1) A grain size distribution with less than 35 percent passing the number 75 um (#200) sieve.
  - 2) A plasticity index (PI) of less than 12.
  - 3) A liquid limit (LL) in excess of 50.
- d) Reclaimed asphalt shall not be used within the ground water table or as a fill if ground water is present.
- e) The RAP used shall be according to the current Bureau of Materials and Physical Research Policy Memorandum, "Reclaimed Asphalt Pavement (RAP) for Aggregate Applications". Gradation deleterious count shall not exceed 10% of total RAP and 5% of other by total weight.

## **CONSTRUCTION REQUIREMENTS**

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

Placing Material. In addition to Article 202.03, broken concrete, reclaimed asphalt with no expansive aggregate, or uncontaminated dirt and sand generated from construction or

demolition activities shall be placed in 6 inches (150 mm) lifts and disked with the underlying lift until a uniform homogenous material is formed. This process also applies to the overlaying lifts. The disk must have a minimum blade diameter of 24 inches (600 mm).

When embankments are to be constructed on hillsides or existing slopes that are steeper than 3H:1V, steps shall be keyed into the existing slope by stepping and benching as shown in the plans or as directed by the engineer.

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.

Stability. The requirement for embankment stability in Article 205.04 will be measured with a Dynamic Cone Penetrometer (DCP) according to the test method in the IDOT Geotechnical Manual. The penetration rate must be equal or less than 1.5 inches (38 mm) per blow.

Basis of Payment. This work will not be paid separately but will be considered as included in EARTH EXCAVATION, FURNISHED EXCAVATION, and STRUCTURE EXCAVATION.



**GROUND TIRE RUBBER (GTR) MODIFIED ASPHALT BINDER (D-1)**

Effective: June 26, 2006

Revised: January 1, 2013

Add the following to the end of article 1032.05 of the Standard Specifications:

“(c) Ground Tire Rubber (GTR) Modified Asphalt Binder. A quantity of 10.0 to 14.0 percent GTR (Note 1) shall be blended by dry unit weight with a PG 64-28 to make a GTR 70-28 or a PG 58-28 to make a GTR 64-28. The base PG 64-28 and PG 58-28 asphalt binders shall meet the requirements of Article 1032.05(a). Compatible polymers may be added during production. The GTR modified asphalt binder shall meet the requirements of the following table.

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

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

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

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

“A dedicated storage tank for the Ground Tire Rubber (GTR) modified asphalt binder shall be provided. This tank must be capable of providing continuous mechanical mixing throughout by continuous agitation and recirculation of the asphalt binder to provide a uniform mixture. The tank shall be heated and capable of maintaining the temperature of

the asphalt binder at 300 °F to 350 °F (149 °C to 177 °C). The asphalt binder metering systems of dryer drum plants shall be calibrated with the actual GTR modified asphalt binder material with an accuracy of  $\pm 0.40$  percent.”

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

“(c) RAP Materials (Note 3) .....1031”

Add the following note to 1030.02 of the Standard Specifications:

Note 3. When using reclaimed asphalt pavement and/or reclaimed asphalt shingles, the maximum asphalt binder replacement percentage shall be according to the most recent special provision for recycled materials.

**HMA MIXTURE DESIGN REQUIREMENTS (D-1)**

Effective: January 1, 2013  
Revised: November 1, 2014

**1) Design Composition and Volumetric Requirements**

Revise the last sentence of the first paragraph of Article 312.05 of the Standard Specifications to read:

“The minimum compacted thickness of each lift shall be according to Article 406.06(d).”

Delete the minimum compacted lift thickness table in Article 312.05 of the Standard Specifications.

Revise the second paragraph of Article 355.02 of the Standard Specifications to read:

“The mixture composition used shall be IL-19.0.”

Revise Article 355.05(a) of the Standard Specifications to read:

“(a) The top lift thickness shall be 2 1/4 in. (60 mm) for mixture composition IL-19.0.”

Revise the Leveling Binder table and second paragraph of Article 406.05(c) of the Standard Specifications to read:

“Leveling Binder	
Nominal, Compacted, Leveling Binder Thickness, in. (mm)	Mixture Composition
≤ 1 1/4 (32)	IL-4.75, IL-9.5, or IL-9.5L
> 1 1/4 to 2 (32 to 50)	IL-9.5 or IL-9.5L

The density requirements of Article 406.07(c) shall apply for leveling binder, machine method, when the nominal compacted thickness is: 3/4 in. (19 mm) or greater for IL-4.75 mixtures; and 1 1/4 in. (32 mm) or greater for IL-9.5 and IL-9.5L mixtures.”

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

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

Revise the ninth paragraph of Article 406.14 of the Standard Specifications to read:

“Test strip mixture will be evaluated at the contract unit price according to the following.”

Revise Article 406.14(a) of the Standard Specifications to read:

“(a) If the HMA placed during the initial test strip is determined to be acceptable the mixture will be paid for at the contract unit price.”

Revise Article 406.14(b) of the Standard Specifications to read:

“(b) If the HMA placed during the initial test strip (1) is determined to be unacceptable to remain in place by the Engineer, and (2) was not produced within 2.0 to 6.0 percent air voids or within the individual control limits of the JMF according to the Department’s test results, the mixture will not be paid for and shall be removed at the Contractor’s expense. An additional test strip shall be constructed and the mixture will be paid for in full, if produced within 2.0 to 6.0 percent air voids and within the individual control limits of the JMF.”

Revise Article 406.14(c) of the Standard Specifications to read:

“(c) If the HMA placed during the initial test strip (1) is determined to be unacceptable to remain in place by the Engineer, and (2) was produced within 2.0 to 6.0 percent air voids and within the individual control limits of the JMF according to the Department’s test results, the mixture shall be removed. Removal will be paid according to Article 109.04. This initial mixture will be paid for at the contract unit price. An additional test strip shall be constructed and the mixture will be paid for in full, if produced within 2.0 to 6.0 percent air voids and within the individual control limits of the JMF.”

Delete Article 406.14(d) of the Standard Specifications.

Delete Article 406.14(e) of the Standard Specifications.

Delete the last sentence of Article 407.06(c) of the Standard Specifications.

Revise Note 2. of Article 442.02 of the Standard Specifications to read:

“Note 2. The mixture composition of the HMA used shall be IL-19.0 binder, designed with the same Ndesign as that specified for the mainline pavement.”

Delete the second paragraph of Article 482.02 of the Standard Specifications.

Revise the first sentence of the sixth paragraph of Article 482.05 of the Standard Specifications to read:

“When the mainline HMA binder and surface course mixture option is used on resurfacing projects, shoulder resurfacing widths of 6 ft (1.8 m) or less may be placed simultaneously with the adjacent traffic lane for both the binder and surface courses.”

Revise the second sentence of the fourth paragraph of Article 601.04 of the Standard Specifications to read:

“The top 5 in. (125 mm) of the trench shall be backfilled with an IL-19.0L Low ESAL mixture meeting the requirements of Section 1030 and compacted to a density of not less than 90 percent of the theoretical density.”

Revise the second sentence of the fifth paragraph of Article 601.04 of the Standard Specifications to read:

“The top 8 in. (200 mm) of the trench shall be backfilled with an IL-19.0L Low ESAL mixture meeting the requirements of Section 1030 and compacted to a density of not less than 90 percent of the theoretical density.”

Revise Article 1003.03(c) of the Standard Specifications to read:

“(c) Gradation. The fine aggregate gradation for all HMA shall be FA 1, FA 2, FA 20, FA 21, or FA 22. The fine aggregate gradation for SMA shall be FAFM 20.

For mixture IL-4.75 and surface mixtures with an Ndesign = 90, at least 50 percent of the required fine aggregate fraction shall consist of either stone sand, slag sand, or steel slag meeting the FA 20 gradation.

For mixture IL-19.0, Ndesign = 90 the fine aggregate fraction shall consist of at least 67 percent manufactured sand meeting FA 20 or FA 22 gradation. For mixture IL-19.0, Ndesign = 50 or 70 the fine aggregate fraction shall consist of at least 50 percent manufactured sand meeting FA 20 or FA 22 gradation. The manufactured sand shall be stone sand, slag sand, steel slag sand, or combinations thereof.

Gradation FA 1, FA 2, or FA 3 shall be used when required for prime coat aggregate application for HMA.”

Delete the last sentence of the first paragraph of Article 1004.03(b) of the Standard Specifications.

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

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

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

2/ The coarse aggregates used shall be capable of being combined with stone sand, slag sand, or steel slag sand meeting the FAFM 20 gradation and mineral filler to meet

the approved mix design and the mix requirements noted herein.  
 3/ CA 13 shall be 100 percent passing the 1/2 in. (12.5mm) sieve.

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

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

Revise the nomenclature table in Article 1030.01 of the Standard Specifications to read:

“High ESAL	IL-19.0 binder; IL-9.5 surface; IL-4.75; SMA-12.5, SMA-9.5
Low ESAL	IL-19.0L binder; IL-9.5L surface; Stabilized Subbase (HMA) <sup>1/</sup> ; HMA Shoulders <sup>2/</sup>

1/ Uses 19.0L binder mix.

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

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

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

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

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

Note 2. The asphalt binder shall be an SBS PG 76-28 when the SMA is used on a full-depth asphalt pavement and SBS PG 76-22 when used as an overlay, except where modified herein. The asphalt binder shall be an Elvaloy or SBS PG 76-22 for IL-4.75, except where modified herein. The elastic recovery shall be a minimum of 80.

Note 3. A stabilizing additive such as cellulose or mineral fiber shall be added to the SMA mixture according to Illinois Modified AASHTO M 325. The stabilizing additive shall meet the Fiber Quality Requirements listed in Illinois Modified AASHTO M 325. Prior to approval and use of fibers, the Contractor shall submit a notarized certification by the producer of these materials stating they meet these requirements. Reclaimed Asphalt Shingles (RAS) may be used in Stone Matrix Asphalt (SMA) mixtures designed

with an SBA polymer modifier as a fiber additive if the mix design with RAS included meets AASHTO T305 requirements. The RAS shall be from a certified source that produces either Type I or Type 2. Material shall meet requirements noted herein and the actual dosage rate will be determined by the Engineer.

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

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

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

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

- 1/ Based on percent of total aggregate weight.
- 2/ The mixture composition shall not exceed 44 percent passing the #8 (2.36 mm) sieve for surface courses with Ndesign = 90.
- 3/ Additional minus No. 200 (0.075 mm) material required by the mix design shall be mineral filler, unless otherwise approved by the Engineer.
- 4/ The maximum percent passing the #635 (20 μm) sieve shall be ≤ 3 percent.

- 5/ When establishing the Adjusted Job Mix Formula (AJMF) the percent passing the #8 (2.36 mm) sieve shall not be adjusted above the percentage stated on the table.
- 6/ When establishing the Adjusted Job Mix Formula (AJMF) the percent passing the #8 (2.36 mm) sieve shall not be adjusted below 34 percent.

Delete Article 1030.04(a)(3) of the Standard Specifications.

Delete Article 1030.04(a)(4) of the Standard Specifications.

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

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

VOLUMETRIC REQUIREMENTS High ESAL				
N <sub>design</sub>	Voids in the Mineral Aggregate (VMA), % minimum			Voids Filled with Asphalt Binder (VFA), %
	IL-19.0	IL-9.5	IL-4.75 <sup>1/</sup>	
50	13.5	15.0	18.5	65 – 78 <sup>2/</sup>
70				65 - 75
90				

1/ Maximum Draindown for IL-4.75 shall be 0.3 percent

2/ VFA for IL-4.75 shall be 72-85 percent”

Revise the table in Article 1030.04(b)(2) of the Standard Specifications to read:

“VOLUMETRIC REQUIREMENTS Low ESAL				
Mixture Composition	Design Compactive Effort	Design Air Voids Target %	VMA (Voids in the Mineral Aggregate), % min.	VFA (Voids Filled with Asphalt Binder), %
IL-9.5L	N <sub>DES</sub> =30	4.0	15.0	65-78
IL-19.0L	N <sub>DES</sub> =30	4.0	13.5	N/A”

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



“(3) SMA Mixtures.

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

- 1/ Maximum draindown shall be 0.3 percent. The draindown shall be determined at the JMF asphalt binder content at the mixing temperature plus 30 °F.
- 2/ Applies when specific gravity of coarse aggregate is  $\geq 2.760$ .
- 3/ Applies when specific gravity of coarse aggregate is  $< 2.760$ .
- 4/ Blending of different types of aggregate will not be permitted. For surface course, the coarse aggregate can be crushed steel slag, crystalline crushed stone or crushed sandstone. For binder course, coarse aggregate shall be crushed stone (dolomite), crushed gravel, crystalline crushed stone, or crushed sandstone.

Delete Article 1030.04(b)(4) of the Standard Specifications.

Delete Article 1030.04(b)(5) from the Supplemental Specifications.

Delete last sentence of the second paragraph of Article 1102.01(a) (13) a.

Add to second paragraph in Article 1102.01 (a) (13) a.:

“As an option, collected bag-house dust may be used in lieu of manufactured mineral filler, provided; 1) there is enough available for the production of the SMA mix for the entire project and 2) a mix design was prepared with collected bag-house dust.”

Revise the table in Article 1030.05(d)(2)a. of the Standard Specifications to read:

Parameter	Frequency of Tests		Test Method See Manual of Test Procedures for Materials
	High ESAL Mixture	Low ESAL Mixture	
Aggregate Gradation  % passing sieves: 1/2 in. (12.5 mm), No. 4 (4.75 mm), No. 8 (2.36 mm), No. 30 (600 μm) No. 200 (75 μm)	1 washed ignition oven test on the mix per half day of production  Note 3.		Illinois Procedure
Asphalt Binder Content by Ignition Oven  Note 1.	1 per half day of production		Illinois-Modified AASHTO T 308
VMA  Note 2.	Day's production ≥ 1200 tons:  1 per half day of production	Day's production < 1200 tons:  1 per half day of production for first 2 days and 1 per day thereafter (first sample of the day)	Illinois-Modified AASHTO R 35
Air Voids  Bulk Specific Gravity of Gyratory Sample  Note 4.	Day's production ≥ 1200 tons:  1 per half day of production	Day's production < 1200 tons:  1 per half day of production for first 2 days and 1 per day thereafter (first sample of the day)	Illinois-Modified AASHTO T 312
Maximum Specific Gravity of Mixture	Day's production ≥ 1200 tons:  1 per half day of production	Day's production < 1200 tons:  1 per half day of production for first 2 days and 1 per day thereafter (first sample of the day)	Illinois-Modified AASHTO T 209

- Note 1. The Engineer may waive the ignition oven requirement for asphalt binder content if the aggregates to be used are known to have ignition asphalt binder content calibration factors which exceed 1.5 percent. If the ignition oven requirement is waived, other Department approved methods shall be used to determine the asphalt binder content.
- Note 2. The  $G_{sb}$  used in the voids in the mineral aggregate (VMA) calculation shall be the same average  $G_{sb}$  value listed in the mix design.
- Note 3. The Engineer reserves the right to require additional hot bin gradations for batch plants if control problems are evident.
- Note 4. The WMA compaction temperature for mixture volumetric testing shall be  $270 \pm 5$  °F ( $132 \pm 3$  °C) for quality control testing. The WMA compaction temperature for quality assurance testing will be  $270 \pm 5$  °F ( $132 \pm 3$  °C) if the mixture is not allowed to cool to room temperature. If the mixture is allowed to cool to room temperature, it shall be reheated to standard HMA compaction temperatures.”

Revise the table in Article 1030.05(d)(2)b. of the Standard Specifications to read:

Parameter	High ESAL Mixture Low ESAL Mixture
Ratio Dust/Asphalt Binder	0.6 to 1.2
Moisture	0.3 %”

Revise the Article 1030.05(d)(4) of the Supplemental Specifications to read:

- “(4) Control Limits. Target values shall be determined by applying adjustment factors to the AJMF where applicable. The target values shall be plotted on the control charts within the following control limits.

"CONTROL LIMITS						
Parameter	High ESAL		SMA		IL-4.75	
	Individual Test	Moving Avg. of 4	Test	Moving Avg. of 4	Individual Test	Moving Avg. of 4
% Passing: <sup>1/</sup>						
1/2 in. (12.5 mm)	± 6 %	± 4 %	± 6 %	± 4 %		
3/8 in. (9.5mm)			± 4 %	± 3 %		
No. 4 (4.75 mm)	± 5 %	± 4 %	± 5 %	± 4 %		
No. 8 (2.36 mm)	± 5 %	± 3 %	± 4 %	± 2 %		
No. 16 (1.18 mm)			± 4 %	± 2 %	± 4 %	± 3 %
No. 30 (600 µm)	± 4 %	± 2.5 %	± 4 %	± 2.5 %		
Total Dust Content No. 200 (75 µm)	± 1.5 %	± 1.0 %			± 1.5 %	± 1.0 %
Asphalt Binder Content	± 0.3 %	± 0.2 %	± 0.2 %	± 0.1 %	± 0.3 %	± 0.2 %
Voids	± 1.2 %	± 1.0 %	± 1.2 %	± 1.0 %	± 1.2 %	± 1.0 %
VMA	-0.7 % <sup>2/</sup>	-0.5 % <sup>2/</sup>	-0.7 % <sup>2/</sup>	-0.5 % <sup>2/</sup>	-0.7 % <sup>2/</sup>	-0.5 % <sup>2/</sup>

1/ Based on washed ignition oven

2/ Allowable limit below minimum design VMA requirement

DENSITY CONTROL LIMITS		
Mixture Composition	Parameter	Individual Test
IL-4.75	N <sub>design</sub> = 50	93.0 - 97.4 % <sup>1/</sup>
IL-9.5	N <sub>design</sub> = 90	92.0 - 96.0 %
IL-9.5, IL-9.5L	N <sub>design</sub> < 90	92.5 - 97.4 %
IL-19.0	N <sub>design</sub> = 90	93.0 - 96.0 %
IL-19.0, IL-19.0L	N <sub>design</sub> < 90	93.0 <sup>2/</sup> - 97.4 %
SMA	N <sub>design</sub> = 80	93.5 - 97.4 %

1/ Density shall be determined by cores or by correlated, approved thin lift nuclear gauge.

2/ 92.0 % when placed as first lift on an unimproved subgrade."

Revise the table in Article 1030.05(d)(5) of the Supplemental Specifications to read:

"CONTROL CHART REQUIREMENTS	High ESAL, Low ESAL, SMA & IL-4.75
Gradation <sup>1/ 3/</sup>	% Passing Sieves: 1/2 in. (12.5 mm) <sup>2/</sup> No. 4 (4.75 mm) No. 8 (2.36 mm) No. 30 (600 µm)
Total Dust Content <sup>1/</sup>	No. 200 (75 µm)
	Asphalt Binder Content
	Bulk Specific Gravity
	Maximum Specific Gravity of Mixture
	Voids
	Density
	VMA

1/ Based on washed ignition oven.

2/ Does not apply to IL-4.75.

3/ SMA also requires the 3/8 in. (9.5 mm) sieve."

Delete Article 1030.05(d)(6)a.1.(b.) of the Standard Specifications.

Delete Article 1030.06(b) of the Standard Specifications.

Delete Article 1102.01(e) of the Standard Specifications.

## 2) Design Verification and Production

Description. The following states the requirements for Hamburg Wheel and Tensile Strength testing for High ESAL, IL-4.75, and Stone Matrix Asphalt (SMA) hot-mix asphalt (HMA) mixes during mix design verification and production.

Mix Design Testing. Add the following below the referenced AASHTO standards in Article 1030.04 of the Standard Specifications:

AASHTO T 324 Hamburg Wheel Test

AASHTO T 283 Tensile Strength Test

Add the following to Article 1030.04 of the Standard Specifications:

"(d) Verification Testing. High ESAL, IL-4.75, and SMA mix designs submitted for verification will be tested to ensure that the resulting mix designs will pass the required criteria for the Hamburg Wheel Test (IL mod AASHTO T-324) and the Tensile Strength Test (IL mod AASHTO T-283). The Department will perform a

verification test on gyratory specimens compacted by the Contractor. If the mix fails the Department's verification test, the Contractor shall make the necessary changes to the mix and resubmit compacted specimens to the Department for verification. If the mix fails again, the mix design will be rejected.

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

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

Illinois Modified AASHTO T 324 Requirements <sup>1/</sup>

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

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

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

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

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

"(a) High ESAL, IL-4.75, WMA, and SMA Mixtures. For each contract, a 300 ton (275 metric tons) test strip, except for SMA mixtures it will be 400 ton (363 metric ton), will be required at the beginning of HMA production for each mixture with a quantity of 3000 tons (2750 metric tons) or more according to the Manual of Test Procedures for Materials "Hot Mix Asphalt Test Strip Procedures".

Before start-up, target values shall be determined by applying gradation correction factors to the JMF when applicable. These correction factors shall be determined from previous experience. The target values, when approved by the Engineer, shall be used to control HMA production. Plant settings and control charts shall be set according to target values.

Before constructing the test strip, target values shall be determined by applying gradation correction factors to the JMF when applicable. After any JMF adjustment, the

JMF shall become the Adjusted Job Mix Formula (AJMF). Upon completion of the first acceptable test strip, the JMF shall become the AJMF regardless of whether or not the JMF has been adjusted. If an adjustment/plant change is made, the Engineer may require a new test strip to be constructed. If the HMA placed during the initial test strip is determined to be unacceptable to remain in place by the Engineer, it shall be removed and replaced.

The limitations between the JMF and AJMF are as follows.

Parameter	Adjustment
1/2 in. (12.5 mm)	± 5.0 %
No. 4 (4.75 mm)	± 4.0 %
No. 8 (2.36 mm)	± 3.0 %
No. 30 (600 µm)	*
No. 200 (75 µm)	*
Asphalt Binder Content	± 0.3 %

\* In no case shall the target for the amount passing be greater than the JMF.

Any adjustments outside the above limitations will require a new mix design.

Mixture sampled to represent the test strip shall include additional material sufficient for the Department to conduct Hamburg Wheel testing according to Illinois Modified AASHTO T324 (approximately 60 lb (27 kg) total).

The Contractor shall immediately cease production upon notification by the Engineer of failing Hamburg Wheel test. All prior produced material may be paved out provided all other mixture criteria is being met. No additional mixture shall be produced until the Engineer receives passing Hamburg Wheel tests.

The Department may conduct additional Hamburg Wheel tests on production material as determined by the Engineer."

Revise the title of Article 1030.06(b) of the Standard Specifications to read:

"(b) Low ESAL Mixtures."

Add the following to Article 1030.06 of the Standard Specifications:

"(c) Hamburg Wheel Test. All HMA mixtures shall be sampled within the first 500 tons (450 metric tons) on the first day of production or during start up with a split reserved for the Department. The mix sample shall be tested according to the Illinois Modified AASHTO T 324 and shall meet the requirements specified herein. Mix production shall not exceed 1500 tons (1350 metric tons) or one day's production, whichever comes first, until the testing is completed and the mixture is found to be in conformance. The requirement to cease mix production may be waived if the plant produced mixture demonstrates conformance prior to start of mix production for a contract. The Department may conduct additional Hamburg Wheel Tests on production material as determined by the Engineer. If the mixture fails to meet the Hamburg Wheel criteria,

no further mixture will be accepted until the Contractor takes such action as is necessary to furnish a mixture meeting the criteria”

The Contractor shall immediately cease production upon notification by the Engineer of failing Hamburg Wheel test. All prior produced material may be paved out provided all other mixture criteria are being met. No additional mixture shall be produced until the Engineer receives passing Hamburg Wheel tests.

Method of Measurement:

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

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

Basis of Payment.

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

“For all mixes designed and verified under the Hamburg Wheel criteria, the cost of furnishing and introducing anti-stripping additives in the HMA will not be paid for separately, but shall be considered as included in the contract unit price of the HMA item involved.

No additional compensation will be awarded to the Contractor because of reduced production rates associated with the addition of the anti-stripping additive.”



**HOT MIX ASPHALT - QUANTITY CORRECTION (BMPR)**

Effective: October 1, 2014  
Revised: October 2, 2014

Revise the fifth paragraph of Article 406.13(b) of the Standard Specifications to read as follows:

“HMA and Stone Matrix Asphalt (SMA) mixture in excess of 103 percent of the quantity shown on the plans or the plan quantity as specified by the Engineer will not be measured for payment. The “adjusted quantity to be placed” and the “adjusted pay quantity” for HMA and SMA mixtures will be calculated as follows.

Adjusted Quantity To Be Placed = C x quantity shown on the plans or the plan quantity as specified by the Engineer

where: C = English:  $C = \frac{G_{mb} \times 46.8}{U}$       Metric:  $C = \frac{G_{mb} \times 24.99}{U}$

and where:  $G_{mb}$  = average bulk specific gravity from approved mix design  
U = unit weight of HMA shown on the plans in lb/sq yd/in.  
(kg/sq m/25 mm), used to estimate plan quantity  
46.8 = English constant  
24.99 = metric constant

Adjusted Pay Quantity (not to exceed 103 percent of the quantity shown on the plans or the plan quantity as specified by the Engineer) = B x HMA tons actually placed

where:  $B = \frac{1}{C}$

If project circumstances warrant a new mix design, the above equations shall be used to calculate the adjusted plan quantity and adjusted pay quantity for each mix design using its respective average bulk specific gravity.”

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

Effective: November 1, 2012

Revise: August 15, 2014

Revise Section 1031 of the Standard Specifications to read:

**“SECTION 1031. RECLAIMED ASPHALT PAVEMENT AND RECLAIMED ASPHALT SHINGLES**

**1031.01 Description.** Reclaimed asphalt pavement and reclaimed asphalt shingles shall be according to the following.

- (a) Reclaimed Asphalt Pavement (RAP). RAP is the material resulting from cold milling or crushing an existing hot-mix asphalt (HMA) pavement. RAP will be considered processed FRAP after completion of both crushing and screening to size. The Contractor shall supply written documentation that the RAP originated from routes or airfields under federal, state, or local agency jurisdiction.
- (b) Reclaimed Asphalt Shingles (RAS). Reclaimed asphalt shingles (RAS). RAS is from the processing and grinding of preconsumer or post-consumer shingles. RAS shall be a clean and uniform material with a maximum of 0.5 percent unacceptable material, as defined in Bureau of Materials and Physical Research Policy Memorandum “Reclaimed Asphalt Shingle (RAS) Sources”, by weight of RAS. All RAS used shall come from a Bureau of Materials and Physical Research approved processing facility where it shall be ground and processed to 100 percent passing the 3/8 in. (9.5 mm) sieve and 90 percent passing the #4 (4.75 mm) sieve. RAS shall meet the testing requirements specified herein. In addition, RAS shall meet the following Type 1 or Type 2 requirements.
  - (1) Type 1. Type 1 RAS shall be processed, preconsumer asphalt shingles salvaged from the manufacture of residential asphalt roofing shingles.
  - (2) Type 2. Type 2 RAS shall be processed post-consumer shingles only, salvaged from residential, or four unit or less dwellings not subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP).

**1031.02 Stockpiles.** RAP and RAS stockpiles shall be according to the following.

- (a) RAP Stockpiles. The Contractor shall construct individual, sealed RAP stockpiles meeting one of the following definitions. Additional processed RAP (FRAP) shall be stockpiled in a separate working pile, as designated in the QC Plan, and only added to the sealed stockpile when test results for the working pile are complete and are found to meet tolerances specified herein for the original sealed FRAP stockpile. Stockpiles shall be sufficiently separated to prevent intermingling at the base. All stockpiles (including unprocessed RAP and FRAP) shall be identified by signs indicating the type as listed below (i.e. “Non- Quality, FRAP -#4 or Type 2 RAS”, etc...).
- (1) Fractionated RAP (FRAP). FRAP shall consist of RAP from Class I, Superpave HMA (High and Low ESAL) or equivalent mixtures. The coarse aggregate in FRAP shall be crushed aggregate and may represent more than one aggregate type and/or

quality but shall be at least C quality. All FRAP shall be processed prior to testing and sized into fractions with the separation occurring on or between the #4 (4.75 mm) and 1/2 in. (12.5 mm) sieves. Agglomerations shall be minimized such that 100 percent of the RAP in the coarse fraction shall pass the maximum sieve size specified for the mix the FRAP will be used in.

- (2) Restricted FRAP (B quality) stockpiles shall consist of RAP from Class I, Superpave (High ESAL), or HMA (High ESAL). If approved by the Engineer, the aggregate from a maximum 3.0 inch single combined pass of surface/binder milling will be classified as B quality. All millings from this application will be processed into FRAP as described previously.
- (3) Conglomerate. Conglomerate RAP stockpiles shall consist of RAP from Class I, Superpave HMA (High and Low ESAL) or equivalent mixtures. The coarse aggregate in this RAP shall be crushed aggregate and may represent more than one aggregate type and/or quality but shall be at least C quality. This RAP may have an inconsistent gradation and/or asphalt binder content prior to processing. All conglomerate RAP shall be processed (FRAP) prior to testing. Conglomerate RAP stockpiles shall not contain steel slag or other expansive material as determined by the Department.
- (4) Conglomerate "D" Quality (DQ). Conglomerate DQ RAP stockpiles shall consist of RAP from HMA shoulders, bituminous stabilized subbases or Superpave (Low ESAL)/HMA (Low ESAL) IL-19.0L binder mixture. The coarse aggregate in this RAP may be crushed or round but shall be at least D quality. This RAP may have an inconsistent gradation and/or asphalt binder content. Conglomerate DQ RAP stockpiles shall not contain steel slag or other expansive material as determined by the Department.
- (5) Non-Quality. RAP stockpiles that do not meet the requirements of the stockpile categories listed above shall be classified as "Non-Quality".

RAP or FRAP containing contaminants, such as earth, brick, sand, concrete, sheet asphalt, bituminous surface treatment (i.e. chip seal), pavement fabric, joint sealants, plant cleanout etc., will be unacceptable unless the contaminants are removed to the satisfaction of the Engineer. Sheet asphalt shall be stockpiled separately.

- (b) RAS Stockpiles. Type 1 and Type 2 RAS shall be stockpiled separately and shall be sufficiently separated to prevent intermingling at the base. Each stockpile shall be signed indicating what type of RAS is present. However, a RAS source may submit a written request to the Department for approval to blend mechanically a specified ratio of type 1 RAS with type 2 RAS. The source will not be permitted to change the ratio of the blend without the Department prior written approval. The Engineer's written approval will be required, to mechanically blend RAS with any fine aggregate produced under the AGCS, up to an equal weight of RAS, to improve workability. The fine aggregate shall be "B Quality" or better from an approved Aggregate Gradation Control System source. The fine aggregate shall be one that is approved for use in the HMA mixture and accounted for in the mix design and during HMA production.

Records identifying the shingle processing facility supplying the RAS, RAS type and lot number shall be maintained by project contract number and kept for a minimum of three years.

**1031.03 Testing.** FRAP and RAS testing shall be according to the following.

- (a) FRAP Testing. When used in HMA, the FRAP shall be sampled and tested either during processing or after stockpiling. It shall also be sampled during HMA production.
  - (1) During Stockpiling. For testing during stockpiling, washed extraction samples shall be run at the minimum frequency of one sample per 500 tons (450 metric tons) for the first 2000 tons (1800 metric tons) and one sample per 2000 tons (1800 metric tons) thereafter. A minimum of five tests shall be required for stockpiles less than 4000 tons (3600 metric tons).
  - (2) Incoming Material. For testing as incoming material, washed extraction samples shall be run at a minimum frequency of one sample per 2000 tons (1800 metric tons) or once per week, whichever comes first.
  - (3) After Stockpiling. For testing after stockpiling, the Contractor shall submit a plan for approval to the District proposing a satisfactory method of sampling and testing the RAP/FRAP pile either in-situ or by restockpiling. The sampling plan shall meet the minimum frequency required above and detail the procedure used to obtain representative samples throughout the pile for testing.

Before extraction, each field sample of FRAP, shall be split to obtain two samples of test sample size. One of the two test samples from the final split shall be labeled and stored for Department use. The Contractor shall extract the other test sample according to Department procedure. The Engineer reserves the right to test any sample (split or Department-taken) to verify Contractor test results.

- (b) RAS Testing. RAS shall be sampled and tested during stockpiling according to Bureau of Materials and Physical Research Policy Memorandum, "Reclaimed Asphalt Shingle (RAS) Sources". The Contractor shall also sample as incoming material at the HMA plant.
  - (1) During Stockpiling. Washed extraction and testing for unacceptable materials shall be run at the minimum frequency of one sample per 200 tons (180 metric tons) for the first 1000 tons (900 metric tons) and one sample per 1000 tons (900 metric tons) thereafter. A minimum of five samples are required for stockpiles less than 1000 tons (900 metric tons). Once a  $\leq 1000$  ton (900 metric ton), five-sample/test stockpile has been established it shall be sealed. Additional incoming RAS shall be in a separate working pile as designated in the Quality Control plan and only added to the sealed stockpile when the test results of the working pile are complete and are found to meet the tolerances specified herein for the original sealed RAS stockpile.
  - (2) Incoming Material. For testing as incoming material at the HMA plant, washed extraction shall be run at the minimum frequency of one sample per 250 tons (227 metric tons). A minimum of five samples are required for stockpiles less

than 1000 tons (900 metric tons). The incoming material test results shall meet the tolerances specified herein.

The Contractor shall obtain and make available all test results from start of the initial stockpile sampled and tested at the shingle processing facility in accordance with the facility's QC Plan.

Before extraction, each field sample shall be split to obtain two samples of test sample size. One of the two test samples from the final split shall be labeled and stored for Department use. The Contractor shall extract the other test sample according to Department procedures. The Engineer reserves the right to test any sample (split or Department-taken) to verify Contractor test results.

**1031.04 Evaluation of Tests.** Evaluation of tests results shall be according to the following.

- (a) Evaluation of FRAP Test Results. All test results shall be compiled to include asphalt binder content, gradation and, when applicable (for slag),  $G_{mm}$ . A five test average of results from the original pile will be used in the mix designs. Individual extraction test results run thereafter, shall be compared to the average used for the mix design, and will be accepted if within the tolerances listed below.

Parameter	FRAP
No. 4 (4.75 mm)	± 6 %
No. 8 (2.36 mm)	± 5 %
No. 30 (600 μm)	± 5 %
No. 200 (75 μm)	± 2.0 %
Asphalt Binder	± 0.3 %
$G_{mm}$	± 0.03 <sup>1/</sup>

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

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

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

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

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

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

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

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

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

The Engineer will notify the Contractor of observed deficiencies.

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

Test Parameter	Acceptable Limits of Precision	
	FRAP	RAS
% Passing: <sup>1/</sup>		
1 / 2 in.	5.0%	
No. 4	5.0%	
No. 8	3.0%	4.0%
No. 30	2.0%	3.0%
No. 200	2.2%	2.5%
Asphalt Binder Content	0.3%	1.0%
G <sub>mm</sub>	0.030	

1/ Based on washed extraction.

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

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

**1031.05 Quality Designation of Aggregate in RAP and FRAP.**

- (a) RAP. The aggregate quality of the RAP for homogenous, conglomerate, and conglomerate "D" quality stockpiles shall be set by the lowest quality of coarse aggregate in the RAP stockpile and are designated as follows.
- (1) RAP from Class I, Superpave/HMA (High ESAL), or (Low ESAL) IL-9.5L surface mixtures are designated as containing Class B quality coarse aggregate.
  - (2) RAP from Superpave/HMA (Low ESAL) IL-19.0L binder mixture is designated as Class D quality coarse aggregate.
  - (3) RAP from Class I, Superpave/HMA (High ESAL) binder mixtures, bituminous base course mixtures, and bituminous base course widening mixtures are designated as containing Class C quality coarse aggregate.
  - (4) RAP from bituminous stabilized subbase and BAM shoulders are designated as containing Class D quality coarse aggregate.
- (b) FRAP. If the Engineer has documentation of the quality of the FRAP aggregate, the Contractor shall use the assigned quality provided by the Engineer.

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

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

- (a) FRAP. The use of FRAP in HMA shall be as follows.
- (1) Coarse Aggregate Size (after extraction). The coarse aggregate in all FRAP shall be equal to or less than the nominal maximum size requirement for the HMA mixture to be produced.
  - (2) Steel Slag Stockpiles. FRAP stockpiles containing steel slag or other expansive material, as determined by the Department, shall be homogeneous and will be

approved for use in HMA (High ESAL and Low ESAL) mixtures regardless of lift or mix type.

- (3) Use in HMA Surface Mixtures (High and Low ESAL). FRAP stockpiles for use in HMA surface mixtures (High and Low ESAL) shall have coarse aggregate that is Class B quality or better. FRAP shall be considered equivalent to limestone for frictional considerations unless produced/screened to minus 3/8 inch.
  - (4) Use in HMA Binder Mixtures (High and Low ESAL), HMA Base Course, and HMA Base Course Widening. FRAP stockpiles for use in HMA binder mixtures (High and Low ESAL), HMA base course, and HMA base course widening shall be FRAP in which the coarse aggregate is Class C quality or better.
  - (5) Use in Shoulders and Subbase. FRAP stockpiles for use in HMA shoulders and stabilized subbase (HMA) shall be FRAP, Restricted FRAP, conglomerate, or conglomerate DQ.
- (b) RAS. RAS meeting Type 1 or Type 2 requirements will be permitted in all HMA applications as specified herein.
- (c) FRAP and/or RAS Usage Limits. Type 1 or Type 2 RAS may be used alone or in conjunction with FRAP in HMA mixtures up to a maximum of 5.0% by weight of the total mix.

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

Max Asphalt Binder Replacement for FRAP with RAS Combination

HMA Mixtures <sup>1/ 2/</sup>	Maximum % ABR		
	Binder/Leveling Binder	Surface	Polymer Modified <sup>3/</sup>
30L	50	40	10
50	40	35	10
70	40	30	10
90	40	30	10 <sup>4/</sup>
4.75 mm N-50			30
SMA N-80			20

- 1/ For HMA "All Other" (shoulder and stabilized subbase) N-30, the percent asphalt binder replacement shall not exceed 50% of the total asphalt binder in the mixture.
- 2/ When the binder replacement exceeds 15 percent for all mixes, except for SMA and IL-4.75, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent binder replacement using a virgin asphalt binder grade of PG64-22 will be reduced to a PG58-28). When constructing full depth HMA and the



ABR is less than 15 percent, the required virgin asphalt binder grade shall be PG64-28.

- 3/ When the ABR for SMA or IL-4.75 is 15 percent or less, the required virgin asphalt binder shall be SBS PG76-22 and the elastic recovery shall be a minimum of 80. When the ABR for SMA or IL-4.75 exceeds 15%, the virgin asphalt binder grade shall be SBS PG70-28 and the elastic recovery shall be a minimum of 80.
- 4/ For polymerized surface mix used for overlays, with up to 10 percent ABR, a SBS PG70-22 will be required. However, if used in full depth HMA, a SBS PG70-28 will be required.

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

- (a) FRAP and/or RAS. FRAP and /or RAS mix designs shall be submitted for verification. If additional FRAP or RAS stockpiles are tested and found to be within tolerance, as defined under "Evaluation of Tests" herein, and meet all requirements herein, the additional FRAP or RAS stockpiles may be used in the original design at the percent previously verified.
- (b) RAS. Type 1 and Type 2 RAS are not interchangeable in a mix design. A RAS stone bulk specific gravity ( $G_{sb}$ ) of 2.500 shall be used for mix design purposes.

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

To remove or reduce agglomerated material, a scalping screen, gator, crushing unit, or comparable sizing device approved by the Engineer shall be used in the RAS and FRAP feed system to remove or reduce oversized material. If 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 during mix production, corrective actions fail to maintain FRAP, RAS or QC/QA test results within control tolerances or the requirements listed herein the Contractor shall cease production of the mixture containing FRAP or RAS and conduct an investigation that may require a new mix design.

- (a) RAS. RAS shall be incorporated into the HMA mixture either by a separate weight depletion system or by using the RAP weigh belt. Either feed system shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes. The portion of RAS shall be controlled accurately to within  $\pm 0.5$  percent of the amount of RAS utilized. When using the weight depletion system, flow indicators or sensing devices shall be provided and interlocked with the plant controls such that the mixture production is halted when RAS flow is interrupted.
- (b) HMA Plant Requirements. HMA plants utilizing FRAP and/or RAS shall be capable of automatically recording and printing the following information.

(1) Dryer Drum Plants.

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

(2) Batch Plants.

- a. Date, month, year, and time to the nearest minute for each print.
- b. HMA mix number assigned by the Department.
- c. Individual virgin aggregate hot bin batch weights to the nearest pound (kilogram).
- d. Mineral filler weight to the nearest pound (kilogram).
- f. RAS and FRAP weight to the nearest pound (kilogram).
- g. Virgin asphalt binder weight to the nearest pound (kilogram).
- h. Residual asphalt binder in the RAS and FRAP material as a percent of the total mix to the nearest 0.1 percent.

The printouts shall be maintained in a file at the plant for a minimum of one year or as directed by the Engineer and shall be made available upon request. The printing system

will be inspected by the Engineer prior to production and verified at the beginning of each construction season thereafter.

**1031.09 RAP in Aggregate Surface Course and Aggregate Shoulders.** The use of RAP or FRAP in aggregate surface course and aggregate shoulders shall be as follows.

- (a) Stockpiles and Testing. RAP stockpiles may be any of those listed in Article 1031.02, except "Non-Quality" and "FRAP". The testing requirements of Article 1031.03 shall not apply. RAP used to construct aggregate surface course and aggregate shoulders shall be according to the current Bureau of Materials and Physical Research's Policy Memorandum, "Reclaimed Asphalt Pavement (RAP) for Aggregate Applications"
- (b) Gradation. One hundred percent of the RAP material shall pass the 1 1/2 in. (37.5mm) sieve. The RAP material shall be reasonably well graded from coarse to fine. RAP material that is gap-graded, FRAP, or single sized will not be accepted for use as Aggregate Surface Course and Aggregate Shoulders."

**TEMPORARY PAVEMENT**

Effective: March 1, 2003

Revised: April 10, 2008

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

The contractor shall use either Portland cement concrete according to Sections 353 and 354 of the Standard Specifications or HMA according to Sections 355, 356, 406 of the Standard Specifications, and other applicable HMA special provisions as contained herein. The HMA mixtures to be used shall be specified in the plans. The thickness of the Temporary Pavement shall be as described in the plans. The contractor shall have the option of constructing either material type if both Portland cement concrete and HMA are shown in the plans.

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

The removal of the Temporary Pavement, if required, shall conform to Section 440 of the Standard Specification.

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

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

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

**STATUS OF UTILITIES TO BE ADJUSTED**

Effective: January 30, 1987

Revised: January 24, 2013

Utilities companies involved in this project have provided the following estimated durations:

Name of Utility	Type	Location	Estimated Duration of Time for the Completion of Relocation or Adjustments
AT&T	Telephone	Underground: Sta. 104+75 to Sta. 128+66, LT. Overhead: Sta. 104+75 to Sta. 117+00, RT Overhead Crossings: Sta. 109+00, 115+00, 118+00	35 weeks
North Shore Gas	Gas	Sta. 104+75 to Sta. 120+50, RT. Crossing Sta. 120+50 Sta. 120+50 to 124+50, LT.	4 weeks
ComEd	Electric	Overhead: Sta. 104+75 to Sta. 124+00, RT. Overhead Crossings: Sta. 109+00, 115+00, 118+00	6 weeks
Comcast	Cable	Overhead: Sta. 104+75 to Sta. 124+00, RT. Overhead Crossings: Sta. 109+00, 115+00, 118+00	3 weeks
Village of Grayslake	Sewer and Water Main	Water Main: 12" Sta. 109+80 to Sta. 123+50, RT. 12" Crossing Sta. 117+00, LT. Sanitary Sewer: 8" Sta. 120+25 to Sta. 121+50 RT.	Relocation Work Included in the Contract
Central Lake County JAWA	Water Main	Sta. 109+50 to Sta. 123+90, RT	Relocation Work Included in the Contract
Lake County Public Works	Sewer and Water Main	Sta. 110+08 to Sta. 124+50, LT	Relocation Work Included in the Contract

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.

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

- 1) Proposed right of way is clear for contract award.

- 2) Final plans have been sent to and received by the utility company.
- 3) Utility permit is received by the Department and the Department is ready to issue said permit.
- 4) If a permit has not been submitted, a 15 day letter is sent to the utility company notifying them they have 15 days to provide their permit application. After allowing 15 days for submission of the permit the 90 day notice is sent to the utility company.
- 5) Any time within the 90 day relocation period the utility company may request a waiver for additional time to complete their relocation. The Department has 10 days to review and respond to a waiver request.

**SLIPFORM PAVING (D-1)**

Effective: November 1, 2014

Revise Article 1020.04 Table 1, Note (5) of Standard Specifications to read:

“The slump range for slipform construction shall be 1/2 to 1 1/2 in.”

Revise Article 1020.04 Table 1 (metric), Note (5) of Standard Specifications to read:

“The slump range for slipform construction shall be 13 to 40 mm.”

**LCDOT SPECIAL PROVISIONS**

**DIVISION 200 PHOSPHORUS FERTILIZER NUTRIENT BAN (LCDOT)**

Effective: January 1, 2009

Revised: May 19, 2014

Phosphorus Fertilizer Nutrient shall not be used on Lake County Highways.



**20100XXX TREE REMOVAL (XX) (LCDOT)**

Effective: January 1, 2007

Revised: May 19, 2014

**Description:** This work shall consist of cutting, grubbing, removing and disposing of trees and stumps.

**General:** The work shall be performed according to Article 201.04 of the "Standard Specifications" and the following:

*Cut trees and limbs shall be disposed of within five working days. The cut trees and limbs shall be disposed of according to Article 202.03 of the "Standard Specifications".*

**Method of Measurement:** Tree Removal will be measured for payment according to Article 201.10(b) of the "Standard Specifications".

**Basis of Payment:** This work will be paid for at the contract unit price per unit diameter for TREE REMOVAL of the size range specified. *The unit price shall include all equipment, materials and labor required to remove and dispose of designated trees and stumps.*

**20200100 EARTH EXCAVATION (LCDOT)**

Effective: January 1, 2007  
Revised: May 21, 2014

**Description:** This work shall consist of the excavation and transportation of suitable excavated material to embankment locations throughout the limits of the project. This work shall also consist of the excavation, transportation and disposal of excess and unsuitable materials.

**General:** This work shall conform to the requirements of Section 202 of the "Standard Specifications" and the following:

**For this Project the Earth Excavation shall consist of:**

1.  *Excavation to the subgrade elevation.*
2.  *Excavation for topsoil placement.*
3.  *The removal of bituminous material not included in any other pay item.*
4.  *Undercutting, as determined by the Engineer to include:*
  - a.  *Removal of existing topsoil under proposed embankment.*
  - b.  *Removal of unsuitable material in wet areas.*
5.  *Undercutting, based on the recommendations of the soil survey and report.*
  - a. *An estimated quantity of excavation for undercutting has been included in the quantity of Earth Excavation and is shown on the plans.*
  - b. *Undercutting may be employed only at the discretion of the Engineer after it has been determined that the provisions of Section 301 of the "Standard Specifications" will not yield sufficient results to allow the timely progress of the project.*

All excess material shall be disposed of outside the right-of-way according to Article 202.03 of the "Standard Specifications".

Earth moved more than once due to construction staging and/or procedures selected by the Contractor, will not be paid for separately, but shall be considered included in the unit cost of Earth Excavation.

**A Soil Survey and Report:**

- Was performed – A copy is available online with the project plans and contract specifications and it is available for inspection and review at LCDOT.  
 Was not performed.

Washington Street (FAU 187)  
Section 11-00121-11-BR  
Lake County  
Contract No. 61A63

**Method of Measurement:** Earth Excavation will be measured in its original position and the volume in cubic yards computed by the method of average end areas.

**Basis of Payment:** This work will be paid for at the contract unit price per cubic yard for EARTH EXCAVATION. *The unit price shall include all equipment and labor required to excavate, transport and distribute earth.*

**ARTICLE 202.03 REMOVAL AND DISPOSAL OF SURPLUS, UNSTABLE, AND UNSUITABLE MATERIALS AND ORGANIC WASTE (LCDOT)**

Effective: February 18, 2013

Revised: May 19, 2014

**Description:** This work shall consist of the off-site disposal at pre-approved Clean Construction or Demolition Debris (CCDD) facilities of excess uncontaminated soil generated by Lake County Division of Transportation (LCDOT) contract construction projects.

**Definitions:**

**Clean construction or demolition debris (CCDD):** CCDD is uncontaminated broken concrete without protruding metal bars, bricks, rock, stone, or reclaimed asphalt pavement generated from construction or demolition activities. CCDD material may include small incidental quantities of soil that are comingled as part of the removal process. When uncontaminated soil is mixed with any of these materials, the uncontaminated soil is also considered CCDD. Uncontaminated soil that is not mixed with other CCDD materials is not CCDD.

**Uncontaminated Soil:** What constitutes "uncontaminated soil" for purposes of CCDD and uncontaminated soil fill operations is defined in 35 Ill. Adm. Code 1100. Uncontaminated soil means soil that does not contain contaminants in concentrations that pose a threat to human health and safety and the environment.

**General:** CCDD that does not contain any uncontaminated soil may be disposed of at CCDD facilities without additional paperwork. CCDD containing uncontaminated soil from LCDOT construction sites may be disposed of at the facilities listed below.

**LCDOT's Responsibility:** LCDOT will collect and analyze soil samples for pH from the areas with no Potential Impacted Properties (PIPs), and complete the associated IEPA 662 form. The Contractor is relieved of the requirement to have the pH testing performed according to Article 202.03 as revised by the BDE special provision Removal and Disposal of Surplus Materials, included herein. For areas with PIPs, LCDOT will perform the applicable soil testing based on LCDOT's due diligence procedures, and complete the associated IEPA 663 forms. Signed IEPA forms 662 and/or 663 are included in the bid package.

**Contractor's Responsibility:**

The Contractor is expected to use one or more of the County's pre-approved uncontaminated soil disposal facilities listed below. Should a Contractor elect to use an alternate facility for uncontaminated soil disposal, the Contractor shall be responsible for all costs associated with testing, trucking, and tipping fees for proper disposal of all accepted loads, and all costs associated with proper disposal of all rejected loads.

The Contractor shall stage and transport material to the pre-approved receiving facility and shall be responsible for coordination with such facilities on operating hours.

The Contractor shall submit a Material Disposal Plan a minimum of 14 days prior to beginning earthwork activities. The Material Disposal Plan shall detail the methods of removal and disposal of all un-contaminated soil and CCDD leaving the site, for review and approval by the Engineer.

In the event that a pre-approved disposal facility rejects the material, the Contractor shall return the material to the project site for stockpile at a location and manner designated by the Engineer according to the special provision for LOAD CHARGE.

**No soil testing shall be conducted by the Contractor with the exception of onsite photo ionization detectors (PID) screening (at the Contractor's option).**

**Method of Measurement:** This work will not be measured for payment.

**Basis for Payment:** The off-site disposal of uncontaminated soil and/or CCDD, including transportation, facility disposal fees and all other work necessary, will not be paid for but shall be included in the contract unit price per cubic yard of REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL. Rejected Loads will be paid for according to the special provision for LOAD CHARGE.

**Pre-Approved Facilities for Receiving Uncontaminated Soil  
 and/or CCDD from LCDOT Projects**

<p>Midwest Aggregates          28435 W. Route 173          Antioch, IL 60002          (847) 395-2595          Mr. Jim Mertes</p>	<p>Reliable Sand and          Gravel Co., Inc.          2121 S River Road          McHenry, IL 60051          (815) 385-5020          Mr. Don Roberts</p>	<p>47 Acres/Southwind          Business Park          2250 Southwind Boulevard          Bartlett, IL 60103          (630) 497-8700          Mr. William Haworth</p>
<p>Lake in the Hills CCDD          Pingree Rd/Virginia Rd          Lake in the Hills, IL 60156          (630) 497-8700          Mr. Michael Vondra</p>	<p>Reliable Lyons CCDD          4226 S Lawndale Avenue          Lyons, IL 60534          (630) 497-8700          Mr. William Haworth</p>	<p>Blue Heron Business Park –          Bartlett          23108 W Bartlett Road          Bartlett, IL 60103           Mr. William Haworth</p>
<p>Petersen Sand &amp; Gravel          CCDD          914 W Route 120          Lakemoor, IL 60050          (847) 395-3313          Mr. Steve Thelen</p>	<p>Raymond Street – CCDD          1400 Route 25          South Elgin, IL 60177          (630) 497-8700          Mr. William Haworth</p>	<p>Gifford East – CCDD          1395 Gifford Road          Elgin, IL 60120           Mr. William Haworth</p>
<p>Thelen Sand &amp; Gravel          28955 E IL Route 173          Antioch, IL 60002          (847) 395-3313          Mr. Steve Thelen</p>	<p>Middle St – CCDD          1155 W Middle St          South Elgin, IL 60177          (630) 497-8700          Mr. William Haworth</p>	

**20400800 FURNISHED EXCAVATION (LCDOT)**

Effective: January 1, 2008

Revised: May 20, 2014

**Description:** This work shall consist of excavating suitable fill materials from off-site locations approved by the Engineer. The work shall also include transporting the materials to various locations throughout the project limits.

**General:** The work shall be performed according to Section 204 of the "Standard Specifications" except as follows:

This work shall also comply with the "Illinois State Agency Historic Resources Preservation Act" (Public Act 86-707, effective January 1, 1990). Under this Act:

1. *The Contractor shall complete an Environmental Survey Request Form for Borrow/Waste/Use Areas (BDE form 2289 4/15/10 included herein), along with all required attachments, and submit them to the Engineer at the earliest possible date.*
2. *The Engineer shall submit the Environmental Survey Request to IDOT for review and approval. Any and all costs incurred, associated with said review and approval will be borne by the Contractor.*
3. *The Contractor shall not begin work on any Borrow/Use areas until the Environmental Survey Request has been approved.*

*This pay item has been included:*

*as a contingency quantity to establish a unit price.*

*based on the requirement for fill as shown in the quantity schedule on the plans.*

**Method of Measurement:** Furnished Excavation will be measured for payment in cubic yards according to Article 204.07 of the "Standard Specifications".

**Basis of Payment:** This work will be paid for at the contract unit price per cubic yard for FURNISHED EXCAVATION. *The unit price shall include all equipment, materials and labor required to excavate, transport and distribute the furnished material.*

**21101615 TOPSOIL FURNISH AND PLACE, 4" (LCDOT)**

Effective: January 1, 2007

Revised: May 19, 2014

**Description:** This work shall consist of furnishing, excavating, transporting and placing topsoil.

**Materials:** Topsoil (furnished from outside the right-of-way) shall meet the requirements of Article 1081.05(a) of the "Standard Specifications".

**General:** The work shall be performed according to Section 211 of the "Standard Specifications" and the following:

The work shall also comply with the "Illinois State Agency Historic Resources Preservation Act" (Public Act 86-707, effective January 1, 1990). Under this Act

1. *The Contractor shall complete an Environmental Survey Request Form for Borrow/Waste/Use Areas (BDE form 2289 4/15/10 included herein), along with all required attachments, and submit them to the Engineer at the earliest possible date.*
2. *The Engineer shall submit the Environmental Survey Request to the Illinois Department of Transportation for review and approval. Any costs incurred associated with said review and approval will be borne by the Contractor.*
3. *The Contractor shall not begin work on any Borrow/Use areas until the Environmental Survey Request has been approved.*

The Contractor shall collect one representative soil sample from the proposed growing surface which shall be analyzed by an agricultural laboratory approved by the Engineer. The Contractor shall submit the proposed laboratory name and address to the Engineer at the pre-construction conference. The soils analysis shall include (but is not limited to) the recommended application rates of nitrogen and potassium fertilizer nutrients.

Plan quantities reflect a 4" thick topsoil placement in all disturbed areas.

**Method of Measurement:** Topsoil Furnish and Place will be measured for payment in square yards according to Article 211.07 of the "Standard Specifications".

**Basis of Payment:** This work will be paid for at the contract unit price per square yard for TOPSOIL FURNISH AND PLACE, 4". *The cost of the soil analysis will not be paid for separately, but will be included in the cost of TOPSOIL FURNISH AND PLACE, 4". The unit price shall include all equipment, materials and labor required to furnish and place the topsoil. No additional compensation will be allowed for topsoil furnished from locations outside the ROW.*



**28000305 TEMPORARY DITCH CHECKS (LCDOT)**

Effective: April 22, 2010

Revised: May 19, 2014

**Description:** This work shall consist of furnishing, constructing, maintaining, and removing temporary ditch checks.

**General:** The work shall be performed according to Section 280 of the "Standard Specifications", LCDOT Standard Drawing LC2050 and the following:

*The temporary ditch check shall be triangular shaped, urethane foam covered with a geotextile fabric. The temporary ditch check shall be installed on a geotextile fabric apron. The temporary ditch check shall have a triangle base 16" – 20" wide and a minimum triangle height of 8" – 10". The temporary ditch checks shall be installed at the locations specified on the Erosion Control Plan, and/or as directed by the Engineer. The temporary ditch check installation shall be according to the detail shown on the plans and the manufacturer's recommendations.*

*The geotextile fabric shall conform to Article 1080.05 of the "Standard Specifications", for Geotechnical Fabric for French Drains.*

*The temporary ditch checks shall remain in place until just before placing the final landscaping in the ditch area. The Contractor shall not remove the temporary ditch checks if it is raining and/or rain is in the immediate forecast.*

*The ditch checks shall become the property of the Contractor upon their removal.*

**Method of Measurement:** *Temporary Ditch Checks will be measured in place and the length calculated in feet for each ditch check section actually installed.*

**Basis of Payment:** This work will be paid for at the contract unit price per foot for TEMPORARY DITCH CHECKS. *The unit price shall include all work and materials necessary to properly install the temporary ditch checks, maintain the temporary ditch checks throughout the project, and to remove and dispose of the used materials at the completion of the project.*

**28000400 PERIMETER EROSION BARRIER (LCDOT)**

Effective: January 1, 2007  
 Revised: June 6, 2014

**Description:** This work shall consist of constructing, maintaining, removing and disposing of perimeter erosion barrier as part of the project's temporary erosion control system.

**General:** The work shall be performed according to Section 280 of the "Standard Specifications" and the following:

The perimeter erosion barrier shall be limited to temporary silt filter fence meeting the requirements of AASHTO Standard M 288-00. This specification is applicable to the use of a geotextile as a vertical, permeable interceptor designed to remove suspended soil from overland water flow. The function of a temporary silt fence is to filter and allow settlement of soil particles from sediment-laden water. The purpose is to prevent the eroded soil from being transported off the construction site by water runoff.

All removed materials shall be disposed of outside the right-of-way according to Article 202.03 of the "Standard Specifications".

**Materials:**

Geotextile Requirements: The geotextile used for the temporary silt fence shall be classified as supported (with a wire or polymeric mesh backing) or unsupported (no backing). The temporary silt fence geotextile shall meet the requirements of Table 6 included below. All numeric values except Apparent Opening Size (AOS) represent Minimum Average Roll Values (MARV as defined in ASTM D4439). The values for AOS are the Maximum Average Roll Values.

Table 6 – Temporary Silt Fence Requirements

Requirements	Test Methods	Wire Backed Supported Silt Fence <sup>a</sup>	Unsupported Silt Fence	
			Geotextile Elongation $\geq 50\%$ <sup>b</sup>	Geotextile Elongation $< 50\%$ <sup>b</sup>
Maximum Post Spacing		4 feet	4 feet	6 feet
Grab Strength	ASTM D 4632			
Machine direction		90 lbs	124 lbs	124 lbs
X-Machine direction		90 lbs	100 lbs	100lbs
Permittivity <sup>c</sup>	ASTM D 4491	0.05 sec <sup>-1</sup>	0.05 sec <sup>-1</sup>	0.05 sec <sup>-1</sup>
Apparent Opening Size	ASTM D 4751	0.024in maximum average roll value		
Ultraviolet stability (retained strength)	ASTM D 4355	70% after 500 hours of exposure		

Notes:

- a) Silt fence support shall consist of 14-gauge steel wire with a mesh backing of 6" x 6" or prefabricated polymeric mesh of equivalent strength.
- b) As measured according to ASTM D 4632.
- c) These default filtration property values are based on empirical evidence with a variety of sediments. For environmentally sensitive areas, a review of previous experience and/or site or regionally specific geotextile tests should be performed by the agency to confirm suitability of these requirements.

Support Posts: The support posts may be composed of wood, steel or a synthetic material. The posts shall be a minimum length of 3 feet plus the buried depth. They shall have sufficient strength to resist damage during installation and to support the applied loads due to material build up behind the silt fence.

- 1) Hardwood posts shall be a minimum of 1.2" x 1.2"
- 2) No. 2 southern pine posts shall be a minimum of 2.6" x 2.6"
- 3) Steel posts may be U, T, L, or C shape, weighing 1.3 lbs per foot

Fence Support: The wire or polymer support fence shall be at least 30" high and strong enough to support the applied loads. Polymer support fences shall meet the same ultraviolet degradation requirements as the geotextile material (see table 6).

The wire support fence shall:

- Be a minimum of 14-gauge.
- Have a minimum of six horizontal wires.
- The maximum vertical wire spacing shall be 6".

**Construction:**

The silt fence shall be installed with a minimum height above ground of 30". The geotextile at the bottom of the fence shall be buried, in a "J" configuration to a minimum depth of 6", in a trench so that no flow can pass under the silt fence. The trench shall be backfilled and the soil compacted over the geotextile.

The geotextile shall be spliced together with a sewn seam or two sections of fence may be overlapped instead. The sewn seam shall be positioned only at a support post.

The Contractor must demonstrate to the satisfaction of the Engineer that the geotextile can withstand the anticipated sediment loading.

The posts shall be placed at the spacing shown on the project plans. The posts shall be driven or placed a minimum of 20" into the ground. The depth shall be increased to 24" if the fence is placed on a slope of 3:1 or greater. If the 20" depth is impossible to obtain, the posts shall be adequately secured to prevent overturning of the fence due to sediment loading.

The support fence shall be securely fastened to the upslope side of the fence post. The support fence shall extend from the ground surface to the top of the geotextile.

When un-supported fence is used, the geotextile shall be securely fastened to the fence posts.

Field monitoring shall be performed to verify that the placement of an armor system does not damage the geotextile.

Silt fences should be continuous and transverse to the flow. The silt fence should follow the contours of the site as closely as possible. The fence shall also be placed such that runoff cannot flow around the end(s) of the fence.

The silt fence should be located so that the drainage area is limited to an area equivalent to 1000 square feet for each 10 feet of fence length. Caution should be used where the site slope is greater than 1:1, and/or water flow rates exceed 0.1 cubic feet per second for each 10 feet of fence length.

**Maintenance:**

The Contractor shall inspect all temporary silt fences immediately after each rainfall and at least daily during prolonged rainfall. The Contractor shall immediately correct any deficiencies.

The Contractor shall also make a daily review of the location of silt fences in areas where construction activities have altered the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist as determined by the Engineer, additional silt fence shall be installed as directed by the Engineer.

Damaged or otherwise ineffective silt fences shall be repaired or replaced promptly.

Sediment deposits shall either be removed when the deposit reaches half the height of the fence or a second silt fence shall be installed as directed by the Engineer.

The silt fence shall remain in place until the Engineer directs it to be removed. After the fence removal, the Contractor shall remove and dispose of any excess sediment accumulations, dress the area to give it a pleasing appearance, and cover with vegetation all bare areas according to the contract requirements.

The removed silt fence may be used at other locations provided the geotextile and other material requirements continue to be met to the satisfaction of the Engineer.

**Method of Measurement:** This work will be measured for payment in place in feet.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for PERIMETER EROSION BARRIER. *The unit price shall include all work and materials necessary to properly install the perimeter erosion barrier, maintain the perimeter erosion barrier throughout the project, and to remove and dispose of the used materials at the completion of the project.*

**3510XXXX AGGREGATE BASE COURSE, TYPE B X" (LCDOT)**

Effective: December 14, 2012

Revised: May 19, 2014

**Description:** This work shall consist of furnishing and placing aggregate base course material on a prepared subgrade or subbase.

**Materials:** The aggregate shall meet the requirements of Article 1004.04 of the "Standard Specifications" except that

*The aggregate material shall be limited to crushed gravel, crushed stone or crushed concrete.*

*The plasticity index requirements will be waived.*

**General:** The work shall be performed according to Section 351 of the "Standard Specifications".

**Method of Measurement:** Aggregate Base Course, Type B will be measured for payment in square yards of the thickness specified according to Article 311.08(b) of the "Standard Specifications".

**Basis of Payment:** This work will be paid for at the contract unit price per square yard for AGGREGATE BASE COURSE, TYPE B of the depth specified. *The unit price shall include all equipment, materials and labor required to furnish and place the base course.*

**42001300 PROTECTIVE COAT (LCDOT)**

Effective: January 1, 2007

Revised: May 19, 2014

**Description:** This work shall consist of applying a protective coat to exposed concrete surfaces.

**Materials:** The protective coat shall meet the requirements of Article 1023.01 of the "Standard Specifications".

**General:** The work shall be performed according to Article 420.18 of the "Standard Specifications" except that

*The protective coat shall be applied to the exposed surfaces of all concrete pavements and appurtenances regardless of the calendar date limitations contained in the first paragraph of Article 420.18 of the "Standard Specifications".*

**Method of Measurement:** The exposed surfaces of all concrete pavements and appurtenances 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 PROTECTIVE COAT. *The unit price shall include all materials, equipment and labor required for two applications of protective coat to exposed surfaces of concrete pavements and appurtenances. The unit price shall include both applications with no additional compensation for the second coat.*

**42400800 DETECTABLE WARNINGS (LCDOT)**

Effective: February 13, 2007

Revised: May 19, 2014

**Description:** This work shall consist of furnishing and installing detectable warnings in accessibility ramps.

**Materials:** The detectable warnings shall be cast iron panels of the sizes shown on the plans and shall meet the following material specification:

The detectable warning plate shall be constructed of gray iron meeting the requirements of Article 1006.14 of the "Standard Specifications" and ASTM A48, CLASS 35B; or cast ductile iron meeting the requirements of Article 1006.15 of the "Standard Specifications".

The coating system shall consist of a rust inhibiting epoxy primer and a finish coat.

The epoxy primer shall have the following properties:

Property	Test Method	Performance
Humidity	ASTM D1735	1000 Hours Minimum
Water Immersion	ASTM D870	250 Hours Minimum
Corrosion Resistance (Salt Spray)	ASTM B117	1000 Hours Minimum

Cold Rolled Steel Lab Panels

The finish coat shall be a powder coat and shall have the following properties:

Property	Test Method	Performance
Color	---	Federal Yellow
Corrosion Resistance (Salt Spray)	ASTM B117	1000 Hours Minimum

Cold Rolled Steel Lab Panels

**General:** The installation of detectable warnings shall meet the requirements of Article 424.09 of the "Standard Specifications". Grey iron plates shall be installed in concrete accessibility ramps only. Ductile iron plates may be installed in either concrete or hot-mix asphalt (HMA) accessibility ramps.

**Method of Measurement:** This work will be measured for payment in place installed, in square feet. *The concrete area under the detectable warnings will be measured for payment as PORTLAND CEMENT CONCRETE SIDEWALK of the thickness specified, with no deductions made for the detectable warnings panels located within the ramp.*

**Basis of Payment:** This work will be paid for at the contract unit price per square foot of DETECTABLE WARNINGS. *The unit price shall include all equipment, materials and labor required to install the panels.*

**440001XX HOT-MIX ASPHALT SURFACE REMOVAL (LCDOT)**

Effective: January 1, 2007

Revised: May 19, 2014

**Description:** This work shall consist of removing the existing hot-mix asphalt (HMA) surface to a depth specified on the plans with a self propelled milling machine.

**General:** The work shall be performed according to Section 440 of the "Standard Specifications" and the following:

*If the milling machine cuts too deep or tears out areas of the existing pavement which were not designated for removal, the holes shall be filled with leveling binder at the Contractor's expense.*

*Temporary ramps at butt joints shall be provided according to Article 406.08 of the "Standard Specifications". Temporary ramps will not be paid for separately but shall be included in the contract unit bid price for the hot-mix asphalt surface removal, of the depth specified.*

*Penalty – Failure by the Contractor to provide the temporary bituminous ramp shall be grounds for assessment of a penalty of **\$100.00** per lane, per day, per ramp location, for each calendar day thereafter that such facility remains incomplete, after written notification from the Engineer. Such penalty shall be deducted from monies due or to become due to the Contractor under the Contract.*

**Method of Measurement:** Hot-Mix Asphalt Surface Removal will be measured for payment in place and the area computed in square yards for each specified increment thickness of material removed.

**Basis of Payment:** This work will be paid for at the contract unit price per square yard for HOT-MIX ASPHALT SURFACE REMOVAL of the depth specified. *The unit price shall include all equipment, materials, and labor required to remove the HMA surface.*



**6020XXXX CATCH BASINS, TYPE A (LCDOT)**

Effective: January 1, 2007

Revised: May 19, 2014

**Description:** This work shall consist of constructing type A catch basins with frames and grates and/or frames and lids.

**Materials:** The materials shall meet the requirements of Article 602.02 of the "Standard Specifications".

**General:** The work shall be performed according to Section 602 of the "Standard Specifications", IDOT Standard Drawing 602001 and the following:

*The half trap option shown on Standard 602001 shall not be required.*

*A 24" sump shall be provided.*

**Basis of Payment:** This work will be paid for at the contract unit price per each for CATCH BASINS, TYPE A of the diameter specified, and with the frame and grate and/or frame and lid specified. *The unit price shall include all equipment, materials and labor required to construct the catch basin.*

**SECTION 604 FRAMES, GRATES, AND MEDIAN INLETS (LCDOT)**

Effective: January 1, 2007  
Revised: May 19, 2014

**Description:** This work shall be according to Section 604 of the "Standard Specifications" and the following:

*This work shall consist of providing an environmental notice prominently cast into the above grade portion of the frame or grate/lid for all new or proposed drainage structures.*

**General:** *The environmental notice shall be "DUMP NO WASTE, DRAINS TO WATERWAYS" or similar wording. The frames, lids and grates shall be according to Section 604 of the "Standard Specifications". The notice shall be cast into the Type 1 lids (open only), Type 8 grates, Type 11 grates, and Type 24 grates.*

**Basis of Payment:** This work will not be paid for separately, but shall be included in the unit cost of the drainage structure with frame and grate/lid specified.

**6060XXXX COMBINATION CONCRETE CURB AND GUTTER (LCDOT)**

Effective: January 1, 2007  
Revised: May 19, 2014

**Description:** This work shall consist of constructing type B concrete curb and gutter.

**Materials:** The materials shall meet the requirements of Article 606.02 of the "Standard Specifications".

**General:** The work shall be performed according to Section 606 of the "Standard Specifications", IDOT Standard Drawing 606001 and the following:

*One inch expansion joints shall be constructed at maximum intervals of 150 feet.*

*The end treatments as shown on the plans shall conform to the applicable special details. Where no end treatment is specified, curb and gutter endings shall be transitioned to a flat section over the final six feet.*

**Method of Measurement:** Combination Concrete Curb and Gutter will be measured for payment in feet. The measurement will be made along the face of curb according to Article 606.14 of the "Standard Specifications". Transitions from one type of curb and gutter to another will be included in the measured quantities for the type having the largest cross sectional area of concrete. *The transition length will be 10 feet unless otherwise shown on the plans.*

**Basis of Payment:** This work will be paid for at the contract unit price per foot for COMBINATION CONCRETE CURB AND GUTTER of the type specified in the plans. *The unit price shall include all equipment, materials and labor required to construct the curb and gutter.*

**611XXXXX STORM SEWERS (SPECIAL) (LCDOT)**

Effective: January 1, 2007

Revised: May 19, 2014

**Description:** This work shall consist of constructing storm sewers which cross over or under water main or water service lines perpendicularly.

**Materials:** *The storm sewer materials shall be limited to reinforced concrete pipe with rubber gasket joints.*

*Reinforced concrete pipe shall be according to Article 1042.06 of the "Standard Specifications".*

*Rubber gaskets shall be according to Article 1056.01 of the "Standard Specifications".*

**General:** The work shall be performed according to Section 550 of the "Standard Specifications" and 35 Illinois Administrative Code 653.119.

**Method of Measurement:** Storm Sewer (Special) will be measured for payment in place in feet. The measurement will be made according to Article 550.09 of the "Standard Specifications".

**Basis of Payment:** This work will be paid for at the contract unit price per foot for STORM SEWERS (SPECIAL) of the diameter specified. The unit price shall include all labor, materials, and equipment necessary to complete the work as specified herein.

**TRAFFIC CONTROL PLAN (LCDOT)**

Effective 06/01/2012

Traffic Control shall be performed according to the applicable sections of the "Standard Specifications", the "Supplemental Specifications", the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways", the "Quality Standard for Work Zone Traffic Control Devices", any special details and Highway Standards as shown on the plans and the special provisions contained herein.

Special attention is called to Articles 105.03(b), 105.05, and 107.09, and to Sections 701, 704, and 782 of the "Standard Specifications", and to the following Highway Standards, Details, Recurring Special Provisions and Special Provisions contained herein, relating to traffic control.

The Contractor shall contact the Engineer at least 72 hours in advance of beginning work.

**STANDARDS**

701001-02	701006-05	701101-04	701106-02
701201-04	701301-04	701306-03	701311-03
701331-04	701427-02	701502-06	701602-07
701801-05	701901-03	704001-07	

**DETAILS**

Suggested Stages of Construction & Traffic Control Plan Sheets

LC7000	LC7003	LC7004	LC7005
LC7200	LC7201	LC7203	LC7800
LC7802	LC7803	TC-11	TC-14
			TC-21

**RECURRING SPECIAL PROVISIONS**

LRS3 Special Provision for Work Zone Traffic Control Surveillance

**DETOURS**

Detours and road closures on county maintained roads within Lake County, Illinois shall be according to the applicable Articles and Sections of the "Standard Specifications", the "Supplemental Specifications", the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways", the Lake County Division of Transportation's Detour Procedures and Guidelines, any special details and Highway Standards as shown on the Detour Plan and the Special Provisions contained herein. The LCDOT Detour Procedures and Guidelines are available from the LCDOT, Traffic Engineering Section upon request.

**TRAFFIC CONTROL AND PROTECTION (SPECIAL) (LCDOT)**  
Effective 06/01/2012

The Traffic Control and Protection (Special) shall meet the requirements of Division 700. Work Zone Traffic Control and Protection, Signing, and Pavement Marking of the "Standard Specifications" except as follows:

**Article 701.01 Description** shall be replaced with the following:

**701.01 Description.** This item of work shall consist of furnishing, installing, maintaining, replacing, relocating and removing all traffic control devices used for the purpose of regulating, warning or directing traffic during the construction or maintenance of this improvement.

**Article 701.02 Materials** shall be modified by adding the following paragraph:

Traffic control devices include signs and their supports, signals, pavement markings, barricades and their approved weights, channeling devices, warning lights, arrow boards, flaggers, or any other device used for the purpose of regulating, detouring, warning or guiding traffic through or around the construction zone.

**Article 701.04 General** shall be modified by adding the following as the first paragraph:

Traffic Control and Protection (Special) shall be provided as shown on the plans and applicable Highway Standards; as required in these special provisions and the applicable sections of the "Standard Specifications"; and/or as directed by the Engineer.

**Article 701.04 General** shall be modified by adding the following to the fourth paragraph:

The Contractor shall dispatch men, materials, and equipment to correct any such deficiencies. The Contractor shall respond to any call from LCDOT concerning any request for improving or correcting traffic control devices and begin making the requested repairs within two hours from the time of notification.

**Article 701.10 Surveillance** shall be replaced with the following:

The Contractor is required to conduct routine inspections of the work site at a frequency that will allow for the timely replacement of any traffic control device that has become displaced, worn or damaged to the extent that it no longer conforms to the shape, dimensions, color and operational requirements of the MUTCD, the Traffic Control Standards, the IDOT Quality Standard For Work Zone Traffic Control Devices, or will no longer present a neat appearance to motorists. A sufficient quantity of replacement devices, based on vulnerability to damage, shall be readily available to meet this requirement.

The Contractor shall ensure that all the traffic control devices he/she installs are operational, functional and effective 24 hours a day, seven days a week, including holidays.

**Article 701.13 Flaggers (a)** shall be modified by revising the second paragraph of subparagraph (a) by adding the following:

The Engineer will determine when a side road or entrance shall be closed to traffic. The flagger shall be positioned as shown on the plans or as directed by the Engineer.

**Article 701.14 Signs (a)** Road Construction Ahead Signs shall be modified by changing the following in the paragraph:

“ROAD WORK AHEAD” signs shall be required in lieu of “ROAD CONSTRUCTION AHEAD” SIGNS

**Article 701.14 Signs (b)** Work Zone Speed Limit Signs shall be revised to read:

- (b) Work Zone Speed Limit Signs. The Lake County Division of Transportation will specify whether a project meets the criteria for a Work Zone Speed Limit. When specified, the work zone speed limit signs shall be installed as shown on the LCDOT Work Zone Speed Limit Signing Diagram, LC 7203, at a maximum of 20 feet lateral distance of the locations shown on the plans. Failure to install and maintain the required amount of signs at the proper sign spacing shall result in an immediate traffic control deficiency.



All permanent "SPEED LIMIT" signs located within the work zone shall be removed or covered. If the speed limit sign is to be covered, it shall be done in a manner that no part of the legend shall be visible in any lighting condition. This work shall be completed by the Contractor after the method of covering the speed limit signs has been approved by the Engineer.

The work zone speed limit signs and the end work zone speed limit signs in advance of and at the end of the lane closure(s) shall be used for the duration of the closure(s).

The work zone speed limit signs will be removed when roadway conditions return to normal or when the construction project is suspended for more than 30 days.

**Article 701.14 Signs** shall be modified by adding the following section (c),

- (c) Temporary Construction Information Signs. When indicated in the traffic control plan or as directed by the Engineer the Contractor shall furnish, install, maintain, relocate, and remove for various stages of construction Temporary Construction Information Signs.

Temporary Construction Information Signs may include:

Driveway	White Legend on Green Background
Caution – New Lanes Open	Black Legend on Orange Background

The signs, as shown on Lake County Detail LC7201, shall be installed according to the traffic control plan and/or as directed by the Engineer.

**Article 701.15 Traffic Control Devices** (b) Type I, II and III Barricades shall be deleted and replaced with the following:

Type II barricades shall be used at all locations that call for Type I, or Type II barricades.

Type II barricades are used to channelize traffic; to delineate unattended obstacles, patches, excavations, drop-offs, and other hazards; and as check barricades

Any drop off greater than three inches, but less than six inches, located within eight feet of the pavement edge shall be protected by Type II barricades equipped with mono-directional steady burn lights. The barricades shall be placed at a spacing of 100 feet center to center. For any drop off within eight feet of the pavement edge that exceeds six inches, the Type II barricades equipped

with mono-directional steady burn lights shall be placed at a spacing of 50 feet center to center. Barricades that must be placed in excavated areas shall have leg extensions installed so that the top of the barricade is in compliance with the height requirements of IDOT Standard 701901.

Check barricades shall be placed in work areas perpendicular to traffic every 1,000 feet, at one per lane and one per shoulder, to prevent motorists from using work areas as a traveled way. Two additional check barricades shall be placed in advance of each patch excavation or any other hazard in the work area. The first will be placed at the edge of the open traffic lane and the second centered on the closed lane. Check barricades shall be Type II and equipped with flashing amber light.

Type III barricades are used to close traffic lanes and to close roads.

**Article 701.15 Traffic Control Devices** (e) Direction Indicator Barricades shall be modified by adding the following paragraph.

The direction indicator barricades shall meet the requirements for Type II barricades as stated in this special provision. The top panel, which faces traffic, shall be as shown in IDOT Highway Standard 701901. The top panel, facing away from traffic shall have a 12 inch x 24 inch orange and white diagonal panel. The bottom panels shall be eight inches x 24 inches with orange and white diagonal sheeting, as shown in LCDOT's Special Detail LC7200.

**Article 701.15 Traffic Control Devices** (j) Portable Changeable Message Signs shall be modified by adding the following paragraphs:

The PCMS shall be compatible and fully functional with the LCDOT's Transportation Management Center PASSAGE PCMS Control Software. A list of approved PCMS's manufacturers and traffic control vendors is available upon request from the LCDOT. The PCMS shall be tested and approved by the LCDOT and can be sufficiently controlled by the LCDOT NTC IP compliant software. If the PCMS has not been tested or approved by either the Illinois State Toll Highway Authority or the LCDOT then the PCMS will need to be tested and certified by the Delcan Corporation at the Contractor's expense.

Lake County Division of Transportation (PASSAGE)  
Software Developer:  
Delcan  
650 East Algonquin Road, Suite 101  
Schaumburg, IL 60173

In case of a Traffic Incident Management (TIM) event or other County/State declared Emergency Management event, the use of the PCMS may be preempted from the Contractor's use by the Lake County Transportation Management Center for the duration of the incident. If the PCMS must be moved from the limits of the work site to an offsite location to better facilitate the use of the PCMS during the incident, the Contractor will be compensated for the labor and equipment to move the PCMS to the designated location and back, according to Article 109.04 (b) of the "Standard Specifications". In order to facilitate the movement of the PCMS in a timely manner, the LCDOT may use County Forces to move the PCMS to the designated location and/or back, at no additional cost to the Contractor.

When the sign(s) are displaying messages, they shall be considered a traffic control device. At all other times when no message is displayed, they shall be considered equipment.

**Basis of Payment.** Changeable message signs will be paid for at the contract unit price per calendar month for each sign as CHANGEABLE MESSAGE SIGN, as stated in Article 701.20 of this special provision.

**Article 701.17 Specific Construction Operations (c) Surface Courses and Pavement**

(1) Prime Coat shall be replaced by the following:

- (1) Prime Coat. "FRESH OIL" signs (W21-2) shall be used when the prime coat is applied to pavement that is open to traffic. The signs shall remain in place until tracking of the prime ceases. These signs shall be erected a minimum of 500 feet preceding the start of the prime and on all side roads within the posted area. The signs on the side roads shall be posted a minimum of 200 feet from the mainline pavement. These signs are excluded from the time requirements of Article 701.04 of the "Standard Specifications" as modified by this special provision (above). Non-compliance with the provisions of this section, by the Contractor, shall result in an immediate traffic control deficiency deduction. All signs shall have an amber flashing light attached.

**Article 701.17 Specific Procedures (c) Surface Courses and Pavement (2) Cold Milling** shall be replaced by the following:

- (2) Cold Milling. "ROUGH GROOVED SURFACE" signs (W8-1107) shall be used when the road has been cold milled and is open to traffic. The signs shall remain in place until the milled surface condition no longer exists. These signs shall be erected a minimum of 500 feet preceding the start of the milled pavement and on all side roads within the posted area. The signs on the side roads shall be posted a minimum of 200 feet from the mainline pavement. Non-compliance with the provisions of this section, by the Contractor, shall result in an immediate traffic control deficiency deduction. All signs shall have an amber flashing light attached.

**Article 701.17 Specific Procedures** (c) Surface Course and Pavement shall be modified by adding the following paragraph:

- (6) Area Reflective Crack Control Treatment Fabric. "SLIPPERY WHEN WET" signs (W8-5) shall be used when crack control fabric is applied to pavement that is open to traffic. These signs shall remain in place until the binder course is laid. The signs shall be erected a minimum of 500 feet preceding the start of the crack control treatment and on all side roads within the posted area. The signs on the side roads shall be posted a minimum of 200 feet from the mainline pavement. These signs are excluded from the time requirements of Article 701.04 of the "Standard Specifications" as modified by this special provision (above). Non-compliance with the provisions of this section, by the Contractor, shall result in an immediate traffic control deficiency deduction. All signs shall have an amber flashing light attached.

**Article 701.18 Highway Standards Application** (b) Standard 701316 and 701321 (2) g. Detector Loops, shall be replaced with the following:

- g. Detection. Microwave Vehicle Sensors shall be installed as directed by the Engineer. The LCDOT shall approve the proposed microwave vehicle sensor before the Contractor may furnish or install it. The Contractor shall install, wire and adjust the alignment of the sensor according to the manufacturer's recommendations and requirements. The Engineer shall approve the installation. An alternate method of detection may be used if it has been demonstrated and approved by the Department.

The microwave vehicle sensor shall meet the following requirements:

- Detection Range: Adjustable to 60 feet
- Detection Angle: Adjustable, horizontal and vertical
- Detection Pattern: 16 degree beam width minimum [at 50 feet the pattern shall be approximately 15.5 feet wide]
- Mounting: Heavy-duty bracket, predrilled and slotted for pole mounting
- LED Indicator Light: For detection verification

**Article 701.18 Highway Standards Application** (j) Urban Traffic Control, Standards 701501, 701502, 701601, 701602, 701606, 701701, and 701801 (1) General, shall be modified by adding the following paragraphs:

Whenever a lane is closed to traffic using IDOT standard 701601, 701606, or 701701, the pavement width transition sign (W4-2R or W4-2L) shall be used in lieu of the "WORKERS" sign (W21-1 or W21-1a)

Whenever any vehicle, equipment, workers or their activities infringe on the shoulder or within 15 feet of the traveled way, and the traveled way remains unobstructed, then the applicable Traffic Control Standard shall be 701006, 701011, 701101, or 701701. The "SHOULDER WORK AHEAD" sign (W21-5(0)-48) shall be used in lieu of the "WORKERS" sign (W21-1 or W-21-1a).

**Article 701.18 Highway Standards Application** shall be modified by adding the following section (l):

(l) IDOT standard 701331. When IDOT standard 701331 is specified on two-lane, two-way roadways, a "LANE SHIFT AHEAD" sign shall be added 500 feet in advance of W1-3 or W1-4 sign. The Road Work sign (W20-1) shall be extended to a total of 1500' from the start of the lane shift.

**Article 701.19 Method of Measurement** shall be replaced completely with the following:

**701.19 Method of Measurement.**

These items of work will be measured on a lump sum basis for furnishing installing, maintaining, replacing, relocating and removing the traffic control devices required in the plans and these special provisions.

**Article 701.20 Basis of Payment** shall be replaced completely with the following:

**701.20 Basis of Payment**

This work will be paid for at the contract unit price per lump sum for TRAFFIC CONTROL AND PROTECTION (SPECIAL). The payment will be in full for all labor, materials, transportation, and incidentals necessary to furnish, install, maintain, replace, relocate and remove all traffic control devices indicated in the plans and specifications, except for the following items, which will be paid for separately.

- 1) Temporary Bridge Traffic Signals
- 2) Temporary Rumble Strips [where each is defined as 25 feet]
- 3) Temporary Raised Pavement Markers
- 4) Sand module impact attenuators
- 5) Portable Changeable Message Signs
- 6) Temporary Concrete Barrier
- 7) Temporary Pavement Marking-Letters and Symbols
- 8) Temporary Pavement Marking-Line at width specified

The salvage value of the materials removed shall be reflected in the bid price for this item.

Any delays or inconveniences incurred by the Contractor while complying with these requirements shall be considered as part of TRAFFIC CONTROL AND PROTECTION (SPECIAL) and no additional compensation will be allowed.

Any traffic control devices required by the Engineer to implement the Traffic Control Plan as shown in the plans and specifications of the contract shall be considered included in the pay item TRAFFIC CONTROL AND PROTECTION (SPECIAL).

If the Engineer requires additional work involving a substantial change of location and/or work which differs in design and/or work requiring a change in the type of construction, as stated in Article 104.02(d) of the "Standard Specifications", the standards and/or the designs, other than those required in the plans, 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 for the reasons listed above 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 according to standards and/or designs other than those included in the plans. The Contractor shall submit revisions or modifications to the traffic control plan shown in the contract to the Engineer for approval. No additional payment will be made for a Contractor requested modification.

In the event the sum total of all work items for which traffic control and protection is required is increased or decreased by more than ten percent, the contract bid price for TRAFFIC CONTROL AND PROTECTION (SPECIAL) will be adjusted as follows:

$$\text{Adjusted Contract Price} = 0.25P + 0.75P [1 \pm (X - 0.1)]$$

P = the contract price for TRAFFIC CONTROL AND PROTECTION (SPECIAL)

$$X = \frac{\text{Difference between original and final value of work for which traffic control and protection is required.}}{\text{Original value of work for which traffic control and protection is required.}}$$

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 that require the use of TRAFFIC CONTROL AND PROTECTION (SPECIAL).

In the event LCDOT cancels or alters any portion of the contract that result in the elimination or incompleteness of any portion of the work, payment for partially completed work will be made according to Article 104.02 of the "Standard Specifications".

**SECTION 780 PAVEMENT STRIPING (LCDOT)**

Effective: July 1, 2007  
Revised: May 19, 2014

**Description:** This work shall consist of furnishing and applying thermoplastic pavement markings.

**Materials:** The materials shall be according to Article 780.02 of the "Standard Specifications" and the following:

*Article 1095.01 for Thermoplastic Pavement Markings, paragraph (a) Ingredient Materials, subparagraph (4) Glass Beads, shall be modified by adding the following sentence:*

*The percentage of Glass Beads, Type A, shall be raised to 45% by decreasing the percentage of filler material specified in subparagraph (3) by 15% .*

**General:** This work shall be performed according to Section 780 of the "Standard Specifications" and the following:

*The equipment used to apply thermoplastic pavement markings, under this contract, shall be limited to hand-operated equipment only. Truck-mounted equipment shall not be used.*

**Method of Measurement:**

Lines will be measured for payment in place in feet. Double yellow lines will be measured as two separate lines.

Words and symbols shall conform to the sizes and dimensions specified in the Illinois Manual on Uniform Traffic Control Devices and IDOT standard 780001. They will be measured based on the total areas indicated in Table 1 of Section 780 of the "Standard Specifications", or as indicated on the plans.

**Basis of Payment:** This work will be paid for at the contract price per foot of applied THERMOPLASTIC PAVEMENT MARKING – LINE of the width specified; and/or per square foot for THERMOPLASTIC PAVEMENT MARKING – LETTERS AND SYMBOLS.



**X2800500 INLET PROTECTION, SPECIAL (LCDOT)**

Effective: January 1, 2007

Revised: June 6, 2014

**Description:** This work shall consist of furnishing, constructing, maintaining, removing, and disposing of inlet protection as part of the project's temporary erosion control system.

**General:** The work shall be performed according to Section 280 of the "Standard Specifications", and the following:

*The inlet protection shall consist of silt filter fence placed around the perimeter of the inlet. The silt filter fence shall be supported by 1" x 2" wooden stakes with a minimum length of three feet. The stakes shall be spaced no more than three feet apart, and shall be driven into the ground a minimum of 8".*

*The filter fabric shall be installed in a backfilled trench 6" deep and securely attached to the posts by a method approved by the Engineer. The rim elevation of the casting shall be temporarily set a minimum of 6" above the adjacent grade. This elevation may vary to avoid flooding conditions as determined by the Engineer.*

**Method of Measurement:** This work will be measured for payment as individual items and the unit of measurement will be each regardless of the size or type of inlet being protected.

**Basis of Payment:** This work will be paid for at the contract unit price per each for INLET PROTECTION, SPECIAL. *The unit price shall include all work and materials necessary to properly install the inlet protection, maintain the inlet protection throughout the project, and to remove and dispose of the used materials at the completion of the project.*

**X6013600 PIPE UNDERDRAINS 4" (MODIFIED) (LCDOT)**

Effective: January 1, 2007

Revised: May 21, 2014

**Description:** This work shall consist of constructing pipe underdrains.

**Materials:** The pipe underdrain materials shall meet the requirements of Article 601.02 of the "Standard Specifications" except that:

*The pipe shall be limited to:*

- (m) *Perforated Polyvinyl Chloride (PVC) Pipe [1040.03(b)]*
- (n) *Perforated Corrugated Polyvinyl Chloride (PVC) Pipe with a Smooth Interior [1040.03(c)]*
- (r) *Perforated Corrugated Polyethylene (PE) Pipe with a Smooth Interior [1040.04(a)]*

**General:** The work shall be performed according to Section 601 of the "Standard Specifications" and the following:

*Rodent shields and square concrete collars (where required) as shown on LCDOT standard drawing LC6020, shall be included in PIPE UNDERDRAINS 4" (MODIFIED).*

**Method of Measurement:** Pipe underdrains shall be measured in place, in feet, of actual pipe installed.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for PIPE UNDERDRAINS 4" (MODIFIED). *The unit price shall include furnishing and placing all pipe, fittings, connecting pipes, rodent shields, bedding and concrete collars. The unit price shall also include all equipment, materials and labor required to furnish and construct the pipe underdrains.*

**X6030205 FRAMES AND GRATES TO BE ADJUSTED (SPECIAL) (LCDOT)**

Effective: January 1, 2007  
Revised: May 20, 2014

**Description:** This work shall consist of adjusting the frame, with grates or lids, of existing drainage and/or utility structures.

**General:** The work shall be performed according to Section 603 of the "Standard Specifications", except that:

*The frame shall not protrude more than 1½" above the pavement surface at any time during the milling/resurfacing process. This will require more than one adjustment in areas where the milling exceeds 1½".*

*As an option, the Contractor may remove the frame and grate/lid and place a plate over the structure until the binder course is placed. The plate shall then be removed and the frame and grate/lid installed at the final grade prior to the placement of the surface course.*

*As an alternative to the temporary hot-mix asphalt ramp placement required by Article 603.07 of the "Standard Specifications", the Contractor may use a manhole safety ramp. The ramp shall be a compression-molded composite of 100% recycled rubber. The ramp shall have a minimum height of 2".*

Characteristics	Specification	Standard
Density	0.6 oz/cu in	ASTM C 642
Durometer Hardness	65A	ASTM D 2240
Tension Strength	300 PSI	ASTM D 412
Elongation	90%	ASTM D 412
Brittleness	-40° F	ASTM D 746
Coefficient of Thermal Expansion	$8 \times 10^{-5}$	ASTM C 531

*The manhole safety ramp shall fit securely around the structure frame, and shall remain properly installed during use.*

**Method of Measurement:** This work will be measured per each structure with a frame and grate/lid to be adjusted regardless of how many times the frame and grate/lid needs to be adjusted during the project.

**Basis of Payment:** This work will be paid for at the contract unit price per each for FRAMES AND GRATES TO BE ADJUSTED (SPECIAL). *The unit price shall include all equipment, labor and materials required to adjust the designated frame and grate/lid. No additional compensation will be allowed for multiple adjustments to the same structure.*

**X6700405 ENGINEER'S FIELD OFFICE, TYPE A (MODIFIED) (LCDOT)**

Effective: January 1, 2007

Revised: May 19, 2014

**Description:** This work shall consist of furnishing and maintaining in good condition, for the exclusive use of the Engineer, a weatherproof building at a location approved by the Engineer.

**General:** The field office shall meet the requirements of Article 670.02 of the "Standard Specifications", and the following:

- *The field office and the required equipment, supplies and services shall meet the approval of the Engineer.*
- *An electric pencil sharpener shall be included in the field office equipment.*
- *A hand sanitizer shall be included in the restroom facilities.*

**Penalty:** Failure by the Contractor to meet the specified occupancy date for any field office shall be grounds for assessment of a penalty of **\$100** per day for each calendar day thereafter that such facility remains incomplete in any respect. Failure by the Contractor to equip, heat, cool, power, supply or clean the field office shall be grounds for assessment of a penalty of **\$100** per day for each calendar day that the field office remains incomplete after receipt of written notification from the Engineer. Such penalty shall be deducted from monies due or to become due the Contractor under the Contract.

**Basis of Payment:** This item will be paid for at the contract unit price per calendar month for ENGINEER'S FIELD OFFICE, TYPE A (MODIFIED). *The unit price shall include all supplies, equipment, materials and labor required to furnish and maintain the field office.*

**X7810300 RECESSED REFLECTIVE PAVEMENT MARKER (LCDOT)**

Effective: December 2, 2013

Revised: May 20, 2014

**Description:** This work shall consist of furnishing and setting reflective pavement markers in a recessed groove in the pavement. The recessed pavement markers shall be used to supplement other pavement markings, similar to the use of Raised Reflective Pavement Markers.

**Materials:** The reflective pavement marker lens shall be a 3M 190 series pavement marker. The reflector holder shall be a MarkerOne Series R100 reflector holder. The epoxy used shall be as recommended by the pavement marker manufacturer.

**Installation:** The spacing and orientation of the pavement markers shall be as shown on the plans and/or as directed by the Engineer.

A recessed groove shall be cut in the pavement 5.25" wide and 1.0" deep on a 15.5" diameter. A 3.5' long groove shall taper from 0" (normal pavement) to 0.35" depth (full-recessed) before and after the groove. For additional detail see the LCDOT standard LC7805.

The recessed area shall be cleaned free of all loose material, and be dry before the placement of the pavement marker. All excess material resulting from the construction of the recessed area shall be completely removed from the surface of the roadway by means of a vacuum sweeper truck. The pavement marker shall be cemented with epoxy in the center of the 1.0" deep recessed groove.

**Inspection:** A straight edge shall be placed across the recess to check that the top of the marker is below the pavement. The inspection and acceptance shall be according to Article 781.04 of the "Standard Specifications".

**Basis of Payment:** This work will be paid for at the contract unit price each for RECESSED REFLECTIVE PAVEMENT MARKER. *The unit price shall include all costs for cutting the grooves into the pavement. The unit price shall also include all equipment, materials and labor required to install the recessed reflective pavement markers.*

**XX001249 ORNAMENTAL FENCE (LCDOT)**

Effective: January 1, 2007

Revised: May 21, 2014

**Description:** This work shall consist of furnishing and installing a steel fence, gates and accessories as shown on the plans.

**Materials:**

- A. The steel material for the fence framework (i.e., tubular pickets, rails and posts) shall meet the following:
- a. Galvanized after forming:
    - i. Conform to the requirements of ASTM A1011/1011M
    - ii. Minimum yield strength of 50,000 psi.
    - iii. The exterior shall be hot-dip galvanized with a 0.45 oz/ft<sup>2</sup> minimum zinc weight.
    - iv. The interior surface shall be coated with a minimum 81% normal zinc pigmented coating, 0.3 mils minimum thickness.
  - b. Galvanized prior forming
    - i. Conform to the requirements of ASTM A924/A924M
    - ii. Minimum yield strength of 50,000 psi.
    - iii. The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90 oz/ft<sup>2</sup>, Coating Designation G-90.
- B. The manufactured galvanized framework shall be subjected to a thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish. The base coat shall be a zinc-rich thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils. The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils. The color shall be as specified on the standard drawing included in the plans. The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in the following table.

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117 & D1654	Corrosion Resistance over 3,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

**Table 1 – Coating Performance Requirements**

- C. The material for the fence pickets shall be 1" square x 16 gauge tubing. The cross-sectional shape of the rails shall conform to the manufacturer's design with outside cross section dimensions of 1.75" square and a minimum thickness of 14 gauge. Picket holes in the horizontal rail shall be spaced 4.98" on center. The picket retaining rods shall be made of 0.125" diameter galvanized steel. The minimum post size shall be 2½" square x 12 gauge. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections.

The manufacturer's literature (or shop drawings and specifications) shall be submitted to the Engineer prior to ordering the fence. The ornamental fence, as shown on LCDOT standards LC6600, LC6601 and LC6602, and as specified herein, is an industrial quality ornamental steel fence system. The drawings and dimensions were furnished by one manufacturer. An equivalent fence system may be proposed for substitution. The Engineer is the sole judge of what is an equivalent substitution.

**General:** Installation of the fence shall be according to the applicable portions of Section 664 [Chain Link Fence] of the "Standard Specifications", except as follows:

1. Dimensions and design details are as shown on the plans.
2. At some locations, the fencing shall be attached to concrete retaining walls. The attachment methods shall conform to the requirements of the "AASHTO LRFD (Load and Resistance Factor Design) Bridge Design Specifications" (AASHTO 2007) Section 13, "Railings". The allowable attachment methods include coring the concrete to 9" depth and grouting the fence posts in the holes or using mounting brackets and anchors.
3. Fence post installation in soil shall be done using concrete footings as shown on the plans.

**Fence Fabrication:**

- A. The pickets, rails and posts shall be pre-cut to specified lengths. The horizontal rails shall be pre-punched to accept the pickets.
- B. The grommets shall be inserted into the pre-punched holes in the rails and the pickets shall be inserted through the grommets so that the pre-drilled picket holes align with the internal upper raceway of the horizontal rails. (Note: This can best be accomplished by using an alignment template.) Retaining rods shall be inserted into each horizontal rail so that they pass through the predrilled holes in each picket completing the panel assembly.
- C. The completed panels shall be capable of supporting a 600lb load (applied at midspan) without any permanent deformation. Panels with rings shall be biasable to a 12.5% change in grade. Panels without rings shall be biasable to a 25% change in grade.
- D. Gates shall be fabricated using the same components as the fence system. The panel material and gate ends will have the same outside cross section dimensions as the horizontal rail. All rail and upright intersections shall be joined by welding. Picket and rail intersections shall be joined by welding or the same retaining rod used for the panel assembly.

**Installation:**

The fence posts shall be set according to the spacing shown in Table 2,  $\pm 1/2"$ , depending on the nominal span specified.

Span	6' Nominal (67 $\frac{3}{4}$ " Rail)				8' Nominal (92 $\frac{5}{8}$ " Rail)			
	Post Size		Bracket Type		Post Size		Bracket Type	
	2 $\frac{1}{2}$ "	3"	Standard (BB301)	Angle (BB304)	2 $\frac{1}{2}$ "	3"	2 $\frac{1}{2}$ "	3"
Post Settings $\pm 1/2"$ o.c.	71 $\frac{1}{2}$ "	72"	73"	73 $\frac{1}{2}$ "	96"	96 $\frac{1}{2}$ "	97 $\frac{1}{2}$ "	98"

**Table 2 – Post Spacing Requirements**

For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to posts with brackets supplied by the manufacturer. For fencing installed in soil, posts shall be set in concrete footings having a minimum depth of 36" as shown on LCDOT standards LC6000, LC6601 or LC6602 included in the plans.

For fence installed on top of a concrete retaining wall, posts shall be set by methods such as plated posts or grouted core-drilled footings. The anchor method shall conform to the requirements of the "AASHTO LRFD (Load and Resistance Factor Design) Bridge Design Specifications" (AASHTO 2007), Section 13, "Railings". The Contractor shall provide shop drawings of the anchor method to the Engineer for review and approval.



### **FENCE INSTALLATION MAINTENANCE**

When cutting/drilling rails or posts adhere to the following steps to seal the exposed surfaces:

- 1) Remove all metal shavings from cut area.
- 2) Apply custom finish paint matching fence color.

### **GATE INSTALLATION**

Gate posts shall be spaced according to the manufacturers' gate drawings, dependent on standard out to out gate leaf dimensions and gate hardware selected. Type and quantity of gate hinges shall be based on the application; weight, height, and number of gate cycles. The manufacturers' gate drawings shall identify the necessary gate hardware required for the application. Gate hardware shall be provided by the manufacture of the gate and shall be installed per manufacturer's recommendations

Gate posts shall be spaced according to the gate openings specified in the construction plans. The fence panels shall be attached to the posts using mechanically fastened panel brackets supplied by the manufacturer.

**Method of Measurement:** Ornamental Fence will be measured for payment in feet along the top of the fence from center to center of the end posts.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for ORNAMENTAL FENCE. *The unit price shall include furnishing and installing the fence, including all fence connections, connection to a retaining wall (where required), concrete foundations, fence openings and gates (where indicated) and electric grounding. The unit price shall also include all equipment, materials and labor required to install the fence.*

**XX006658 FLOCCULATION LOGS (LCDOT)**  
**XX006659 FLOCCULATION POWDER (LCDOT)**

Effective: January 1, 2007

Revised: August 1, 2011

**Description:** This work shall consist of furnishing and applying Flocculation Logs and/or Flocculation Powder on the project site to minimize soil erosion, bind soil particles, remove suspended particles, and act as a construction aide.

**Materials:** The polymer shall be a water soluble anionic polyacrylamide (PAM). PAMs are manufactured in various forms to be used on specific soil types. Using the wrong PAM may result in performance failures. All site specific soils shall be tested by a Certified Professional in Erosion and Sediment Control (CPESC) each time a PAM is used. The following measures shall be adhered to:

- a) Toxicity: All vendors and suppliers of PAM, PAM mix, or PAM blends, shall supply a written toxicity report, which verifies that the PAM, PAM mix or PAM blends, exhibits acceptable toxicity parameters which meet or exceed the requirements for the State and Federal Water Quality Standards. **Cationic formulations of PAM, PAM blends, polymers or Chitosan are not allowed.**
- b) Performance: All vendors and suppliers of PAM, PAM mix or PAM blends shall supply written "site specific" testing results, demonstrating that a performance of 95% or greater of nephelometric turbidity units (NTU) or total suspended solids (TSS) is achieved from samples taken. In addition to soil testing, a CPESC shall design the installation plan for the polymers based on mix time and point of entry.
- c) Safety: PAM shall be mixed and/or applied in according to all Occupational Safety and Health Administration (OSHA) material safety data sheet (MSDS) requirements and the manufacturer's recommendations for the specified use.

**Construction Requirements:**

**Flocculation Powder Dry Form Application:** Dry form powder may be applied by hand spreader or mechanical spreader. Pre-mixing of dry form PAM into fertilizer, seed or other soil amendments is allowed when approved by the CPESC. The application method shall insure uniform coverage of the target area. Application rates typically range from 10 – 18 pounds per acre.

**Flocculation Powder Hydraulically Applied Application:** PAM is typically used as part of hydraulically applied slurry containing at least mulch and seed to quickly establish vegetation (temporary or permanent). When used without seed, PAM provides temporary erosion protection for cut & fill surfaces. Application rates typically range from 10 - 18 pounds per acre.

Flocculation Powder Installation constraints: Flocculation Powder shall be applied to non-frozen soil surfaces, only. An unfrozen soil surface is defined as any exposed soil surface free of snow, standing water, ice crystals, etc., which is comprised of discrete soil particles unbound to one another by surface or interstacy ice. The temperature shall be at least 40° F, when hydraulically applying the Flocculation Powder

Flocculation Log Installation: A Flocculation Log is a semi-hydrated polyacrylamide block that is placed within storm water and/or construction site drainage to remove fine particles and reduce NTU values. Placement of Flocculation Logs should be as close to the source of particle suspension as possible. Ideal performance of the Flocculation Logs occurs when the product is used in conjunction with other best management practices (BMPs). Each Flocculation Log is specifically formulated for the soil and water chemistry at the site. Soil and water samples will determine which formula Flocculation Log is needed. The samples will also aid in determining proper placement.

Flocculation Products Maintenance plan: As with any other BMP, this system will need to have a maintenance plan in place. The Contractor shall perform the following items as directed by the Engineer:

1. Reapplication of Flocculation Powder to disturbed areas
2. Reapplication of Flocculation Powder to temporary areas
3. Replacement of Flocculation Logs
4. Adjustments to the Storm Water Pollution Prevention Plan

**Method of Measurement:** An estimated quantity of Flocculation Logs is included in the summary of quantities to establish a unit price only. A typical dry log weighs about 10 pounds and is approximately 5" x 4" x 12". Payment will be made based on the actual number of logs used. An estimated quantity of Flocculation Powder is included in the summary of quantities to establish a unit price only. Payment will be made based on the actual quantity (weight) of powder applied.

**Basis of Payment:** FLOCCULATION LOGS will be paid for at the contract unit price per each. FLOCCULATION POWDER will be paid for at the contract unit price per pound. *Payment will be based on the actual number of logs and/or the actual weight of the powder used without a change in unit price because of adjustment in plan quantities, and no extra compensation will be allowed for any delays, inconveniences or damage sustained by the Contractor in performing the work. The unit price shall include all equipment, materials and labor required to furnish and apply flocculation logs and/or flocculation powder.*

**Z0013798 CONSTRUCTION LAYOUT (LCDOT)**

Effective: January 1, 2007

Revised: May 19, 2014

**Description:** This work shall consist of furnishing and placing construction layout stakes for the project.

- **General:** The Lake County Division of Transportation (LCDOT) or Consultant on their behalf (LCDOT) will provide adequate reference points to the centerline of survey and bench marks as shown on the plans and listed herein. Any additional points set by LCDOT will be identified in the field to the Contractor and all field notes will be kept in the office of the Engineer.

The Contractor shall provide the necessary field forces, equipment, and material required to set all the additional stakes for this project. The additional stakes shall include stakes needed to establish offset stakes, reference points, and any other horizontal or vertical controls. The additional stakes will also include any supplementary bench marks necessary to secure a correct layout of the work. Stakes for line and grade of pavement and/or curb and gutter shall be set at sufficient station intervals (not to exceed 50 feet) to assure substantial conformance to plan lines and grades. The Contractor shall not be required to set additional stakes to locate a utility line which is not included as a pay item in the contract or to determine property lines between private properties.

The Contractor shall be responsible for having the finished work conform to the lines, grades, elevations, and dimensions as shown on the plans. Any inspection or checking of the Contractor's layout by the Engineer and the acceptance of all or any part of it shall not relieve the Contractor of his/her responsibility to secure the proper dimensions, grades, and elevations of the several parts of the work. The Contractor shall exercise care in the preservation of stakes and bench marks and shall have them reset at his/her expense when any are damaged, lost, displaced, removed or otherwise obliterated.

**Responsibilities of LCDOT:**

- a) LCDOT will provide adequate reference points to the centerline of all roads and streets except interchange ramps. The centerline of private entrances and short street intersection returns may not be located or referenced.

Locating and referencing the centerline of the survey will consist of establishing and providing coordinates for the alignment points of the centerline(s) e.g. PC's, PT's, and POT's necessary to provide line of sight; and/or traverse points as are necessary to establish said centerlines and provide line of sight.

- b) Bench marks will be established along the project outside of construction lines not exceeding intervals of 1000 feet horizontally and 20 feet vertically.
- c) Stakes set for a) and b) above will be identified in the field to the Contractor.

- d) LCDOT will make random checks of the Contractor's staking to determine if the work is in conformance with the plans. Where the Contractor's work will tie into work that is being or will be done by others, checks will be made to determine if the work is in conformance with the proposed overall grade and horizontal alignment.
- e) LCDOT will set stakes to assist with utility adjustments and/or for building fences along the right of way line by parties other than the Contractor.
- f) LCDOT will make all measurements and take all cross sections from which the various pay items will be measured.
- g) Where the Contractor, in setting construction stakes, discovers discrepancies, LCDOT will check to determine their nature and make whatever revisions are necessary on the plans, including the re-cross sectioning of the area involved. Any additional re-staking required by the Engineer will be the responsibility of the Contractor. Additional re-staking done by the Contractor will be paid for according to Article 109.04 of the "Standard Specifications".
- h) LCDOT will accept responsibility for the accuracy of the initial control points as provided herein.
- i) It is not the responsibility of LCDOT, except as provided herein, to check the correctness of the Contractor's stakes; any apparent errors will be called to the Contractor's attention as soon as discovered and he/she shall be required to make the necessary correction before the stakes are used for construction purposes.
- j) Where the plan quantities for excavation are to be used as the final pay quantities, LCDOT will make sufficient checks to determine if the work has been completed in conformance with the plan cross sections.

**Responsibilities of the Contractor:**

- a) The Contractor shall establish from the given survey points and bench marks all the control points necessary to construct the individual project elements. The Contractor shall provide the Engineer adequate control in close proximity to each individual element to allow adequate checking of construction operations. This includes, but is not limited to: line and grade stakes, line and grade nails in form work, and/or filed or etched marks in substantially completed construction work.

Prior to staking, the Contractor shall run a check of all the benchmarks and control points provided, to determine if any adjustments are necessary due to frost or isolated damage. The Contractor shall provide any adjustment information to the Engineer.

It is the Contractor's responsibility to tie in centerline control points in order to preserve them during construction operations.

**It is the contractor's responsibility to set right-of-way and easement stakes (including changes in right-of-way width and beginning/ending easement stations) prior to the Installation of Perimeter Erosion Barrier or the disturbance of any soil.**

**These stakes shall be set at 100 foot station intervals and maintained throughout the project.**

- b) At the completion of the grading operations, the Contractor shall set stakes at 100 foot station intervals along each profile grade line. These stakes will be used for final cross sectioning by the LCDOT.
- c) The Contractor shall locate the right-of-way points for the installation of right-of-way markers. The Contractor shall set all line stakes for the construction of fences by the Contractor.
- d) All work shall be according to normally accepted self-checking surveying practices. Field notes shall be kept in standard survey field notebooks and electronic staking reports. Copies of the books and electronic reports shall be given to LCDOT at the completion of the project. All notes shall be neat, orderly, and in accepted form.
- e) For highway structure staking, the Contractor shall use diligent care and appropriate accuracy. Points shall be positioned to allow reuse throughout the construction process. Prior to the beginning of construction activities, all structure centerlines and pier lines are to be established by the Contractor and checked by the Engineer. The Contractor shall provide a detailed structure layout drawing showing span dimensions, staking lines, and offset distances.

**Basis of Payment:** This work will be paid for at the contract lump sum price for CONSTRUCTION LAYOUT. *The unit price shall include all equipment, materials and labor required to furnish and place the construction layout stakes.*

**Z0019600 DUST CONTROL WATERING (LCDOT)**

Effective: August 1, 2011

**Description:** This work shall consist of furnishing and applying water to control dust and air-borne dirt generated by construction activities.

**General:** This work shall be performed according to Article 107.36 of the "Standard Specifications" and the following:

Revise Article 107.36 of the "Standard Specifications" as follows:

*Replace sub-paragraph (d) of under the third paragraph with the following:*

*(d) Dust shall be controlled by the uniform application of sprinkled water and shall be applied only when directed and in a manner approved by the Engineer. All equipment used for this work shall meet with the Engineer's approval and shall be equipped with adequate measuring devices for determining the exact amount of water discharged. All water used shall be properly documented by ticket or other approved means.*

*The Contractor is reminded of the provisions of Article 107.18 of the "Special Provisions" regarding the procurement of water from fire hydrants.*

**Method of Measurement:** This work will be measured in units of gallons of water applied. One unit is equivalent to 1,000 gallons of water applied.

**Basis of Payment:** This work will be paid for at the contract unit price per unit for DUST CONTROL WATERING. *The unit price shall include all equipment, materials and labor required to control dust.*

**Z0022800 FENCE REMOVAL (LCDOT)**

Effective: March 21, 2008

Revised: May 19, 2014

**Description:** This work shall consist of the removal and disposal of an existing fence from the project site.

**General:** *The Contractor shall remove all components of the existing fence including any concrete used to anchor fence posts, bracing, guy wires, posts, and/or gates. All removed materials shall be disposed of outside the limits of the right-of-way according to Article 202.03 of the "Standard Specifications" and/or as directed by the Engineer.*

**Method of Measurement:** This work will be measured for payment in feet, along the top of the existing fence, from center to center of end posts, excluding the length occupied by gates.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for FENCE REMOVAL. *The unit price shall include all equipment, materials and labor required to remove and dispose of the fence.*



## **PROJECT SPECIAL PROVISIONS**

### **21301052 EXPLORATION TRENCH 52" DEPTH**

**Description:** This work shall consist of constructing a trench for the purpose of locating existing tile lines, farm underdrains, or other underground appurtenances within the construction limits of the proposed improvement.

**General:** The work shall be performed according to Section 213 of the "Standard Specifications". The exploration trench(s) shall be constructed at a location(s) as directed by the Engineer.

The trench shall be deep enough to expose the underground line, and the width of the trench shall be sufficient to allow proper investigation to determine if the tile line needs to be replaced.

**Method of Measurement:** *The exploration trench will be measured for payment in feet of trench constructed.*

**Basis of Payment:** This work will be paid for at the contract unit price per foot for EXPLORATION TRENCH 52" DEPTH. *Payment will be based on the actual length of trench explored without a change in unit price because of adjustment in plan quantities, and no extra compensation will be allowed for any delays, inconveniences or damage sustained by the Contractor in performing the work. The unit price shall include all equipment, materials and labor required to construct the trench.*

**40200XXX AGGREGATE SURFACE COURSE, TYPE A XX**

**Description:** This work shall consist of furnishing and placing one or more courses of aggregate on a prepared subgrade.

**Materials:** The aggregate shall meet the requirements of Article 1004.04 of the "Standard Specifications" except that

*The aggregate material shall be limited to crushed gravel, crushed stone or crushed concrete. The plasticity index requirements and the requirement to add water at the central mixing plant will be waived.*

**General:** The work shall be performed according to Section 402 of the "Standard Specifications".

**Method of Measurement:** Aggregate Surface Course, Type A will be measured for payment in square yards according to Article 311.08(b) of the "Standard Specifications".

**Basis of Payment:** This work will be paid for at the contract unit price per square yard for AGGREGATE SURFACE COURSE, TYPE A of the depth specified. *The unit price shall include all equipment, materials and labor required to furnish and place the surface course.*

**50300285 FORM LINER TEXTURED SURFACE**

**Description:** This work will consist of providing a textured finish on exposed cast-in-place or precast concrete surfaces. Available and custom formliners apply to this section for the following items as shown in the Contract Documents:

1. Retaining Wall Stone Pattern Formliner – available formliner
2. Retaining Wall Panel Insert Formliner – custom formliner for five (5) unique panels

**Materials:** The materials shall meet the requirements of Article 503.02 of the “Standard Specifications” and the following:

The patterning of the form liner shall appear natural and non-repeating. Seam lines or match lines caused from two or more molds coming together will not be apparent when viewing the final wall.

The molds shall not compress more than ¼ inch when concrete is poured at a rate of ten vertical feet per hour. The molds shall be removable without causing any deterioration of the surface or the underlying concrete.

The forms shall be constructed so that the completed concrete structures conform to the shape, lines and dimensions of the components of the approved pattern as indicated on the Contract Documents. The approved pattern shown on the Contract Documents follows a consistent 30'-0" wide wall spacing module. The forms shall be properly braced or tied together to maintain position and shape. The forms shall be made sufficiently tight to prevent leakage of the mortar. The formwork shall have the strength and stability to ensure the finished concrete dimensions are within the tolerances specified herein.

The Lake County Division of Transportation has pre-approved the following form liner suppliers and patterns for the textured surface:

Manufacturer	Stone Pattern Formliner Types	
	Pattern Number	Pattern Name
<b>Custom Rock International</b> 1156 Homer Street St. Paul, Minnesota 55116 (800) 637-2447 <a href="http://www.custom-rock.com">www.custom-rock.com</a>	Pattern Number 12005	Bearpath Coursed Stone
	Pattern Number 12010	Minnehaha Blend
<b>Fitzgerald Formliners</b> 1341 East Pomona Street Santa Ana, California 92705 (714) 547-6710 <a href="http://www.formliners.com">www.formliners.com</a>	Pattern Number 16997	Long Island Ashlar
	Pattern Number 17911	San Diego Drystack
<b>Greenstreak</b> 3400 Tree Court Industrial Boulevard St. Louis, Missouri 63122 (800) 325-9504 <a href="http://www.greenstreak.com">www.greenstreak.com</a>	Pattern Number 328	Dry Stack Random Stone

The form ties shall be made of either metal or fiberglass. Metal ties, which result in a portion of the tie permanently embedded in the concrete, shall be designed to separate at least one inch back from the finished surface, leaving only a neat hole that can be plugged with patching material. The Contractor shall submit the type of form ties to the Engineer, for approval prior to use in this work,

The joints shall be colored to simulate real mortar.

Class SI concrete used for cast-in-place structures shall contain a high range water-reducing admixture meeting the requirements of Article 1021.03(c) of the "Standard Specifications" to obtain a 5" – 7" slump.

**Qualifications of Contractor:** The concrete formliner contractor shall have a minimum of five (5) years demonstrated experience in fabricating and installing formliners. The contractor shall submit evidence of appropriate experience, job listings and project photographs from previous work.

**Product Data:** Submit manufacturer's data sheets on each product to be used, including printed product data and installation guidelines for formliner system; manufacturer's installation instructions, showing required preparation and installation procedures; storage and handling requirements and recommendations; installation methods; and cleaning and maintenance instructions.

**Shop Drawings.** Prior to fabrication, the Contractor shall submit shop drawings. Shop drawings shall be prepared based on Engineer's digital files provided to the Contractor in AutoCAD or Microstation format. Contractor shall submit shop drawings to the Engineer in the form of plans, elevations and details for the following items:

1. Retaining Wall Stone Pattern Formliner
2. Retaining Wall Panel Insert Formliner

Shop drawings of the concrete facing patterns shall be submitted for each area of textured concrete. Shop drawing submittals shall include:

1. Individual form liner pattern descriptions, dimensions, and sequencing of form liner sections. Include details showing typical cross sections, joints, corners, step footings, stone relief, stone size, pitch/working line, mortar joint and bed depths, joint locations, edge treatments, and any other special conditions.
2. Elevation views of the form liner panel layouts for the texture showing the full length and height of the structures including the footings with each form liner panel outlined. The arrangement of the form liner panels shall provide a continuous pattern of desired textures and colors with no interruption of the pattern made at the panel joints.
3. Shop drawings shall be provided for each of the five (5) unique panel insert formliners.

To minimize the possibility of preparing an unsatisfactory Cast Concrete Mockup as described herein, the Contractor may elect to provide shop drawings for the Mockups.

**Sample Panels:** The Contractor shall select a form liner pattern from above, propose an equivalent form liner and create custom form liners as indicated on the Contract Documents. The form liner shall meet the requirements of Article 503.06(a) and the following:

For a proposed equivalent the Contractor shall submit to the Engineer one specification and catalog cut sheet for the style(s) of architectural form liner proposed for use on the project. Note that the same style of form liner shall be used on all surfaces within the project limits unless otherwise indicated on the Contract Documents. The submittal shall be made no later than 14 calendar days from the date of notification to proceed with the contract. Upon receipt of the information, the Engineer, in consultation with Lake County Division of Transportation (LCDOT) and other local government agencies will have 30 calendar days to approve and notify the Contractor of which style of form liner is to be used on the project.

Upon receipt of notification of the style of form liner to be used and/ or if the Contractor is proposing a form liner from the pre-approved list, he/she shall submit a proposed procedure for obtaining the simulated finish. The procedure shall include plans and details for the form liner pattern and dimensions, and be submitted for the Engineer's approval no later than 30 calendar days from the date of notification of approval of the style type. If such plans and details are not satisfactory to the Engineer and LCDOT, the Contractor shall make any changes as may be required by the Engineer or LCDOT at no additional cost to the Department.

Upon approval of the form liner plans and details, the Contractor shall submit a 3' by 3' (minimum) sample concrete panel of each of the following in quantities indicated below:

1. Retaining Wall Stone Pattern Formliner - 1 sample
2. Retaining Wall Panel Insert Formliner - 1 sample of each of five (5) unique panel inserts

The sample panels shall be delivered and positioned on the job site at a location to be determined by the Engineer. The sample shall also include the concrete stain if it is included in the contract.

**Mockup:** The contractor shall build a mockup on site 30 days prior to commencing work, using the same materials, methods and work force that will be used for the project. Engineer will determine specific requirements and location, and whether mockup shall be incorporated as part of the final project. The size of the mockup shall be 16 square feet or larger if needed to adequately illustrate the pattern and texture selected. The contractor shall include an area to demonstrate the formliner butt joint, and if appropriate, continuation of pattern through construction joint. Mockups shall be created for each of the following in quantities indicated below:

1. Retaining Wall Stone Pattern Formliner – 1 mockup
2. Retaining Wall Panel Insert Formliner - 1 mockup

**General:** The work shall be performed according to Article 503.06 of the "Standard Specifications" and the following:

**Delivery:** The form liner materials shall be delivered to the location in unopened factory containers. Upon arrival, materials shall be inspected for damage and manufacturer informed of any discrepancies. Deficient materials shall not be used. Materials shall be stored in a protected location and safeguarded from damage. Store formliners covered and elevated off the exposed ground. Protect liquid materials from freezing temperatures and temperatures in excess of 90 degrees F (32 degrees C). Store covered, out of direct sunlight.

The form liners shall be installed according to the manufacturers' recommendations to achieve the highest quality concrete appearance possible. The form liners shall withstand the concrete placement pressures without leakage, physical or visual defects.

The Contractor shall clean the form liners, removing any buildup prior to each use. The Contractor shall inspect each form for blemishes or tears and make repairs as needed following manufacturer's recommendations.

The Contractor shall install the form liners with less than ¼ inch separation between them. The molds shall be attached securely to the forms following manufacturer's recommendations. The panels shall be attached to each other with flush seams and seams filled as necessary to eliminate visible evidence of seams in the cast concrete.

The liner butt joints shall be blended into the pattern so as to eliminate visible vertical or horizontal seams and conspicuous form butt joint marks. The liner joints shall fall within pattern joints or reveals. The finished textures shall be continuous without visual disruption and properly aligned over adjacent and multiple liner panels. Continuous or single liner panels shall be used where liner joints may interrupt the intended pattern. Panel remnants shall not be pieced together.

The Contractor shall notify the Engineer at least 48 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.

The Contractor shall apply the form release agent to all surfaces of the form liner which will come in contact with concrete, according to the manufacturers' recommendations.

The Contractor shall employ proper consolidation methods to ensure the highest quality finish. Internal vibration shall be achieved with a vibrator of appropriate size, the highest frequency, and low - moderate amplitude. Concrete placement shall be in lifts not to exceed 1.5 feet. Internal vibrator operation shall be at appropriate intervals and depths and withdrawn slowly enough to assure a minimal amount of surface air voids and the best possible finish without causing segregation. An external form vibrator may be required to assure the proper results. The use of an external form vibrator must be approved by the form liner manufacturer and the Department.

The Contractor shall coordinate concrete pours to prevent visible differences between individual pours or batches. Concrete pours shall be continuous between construction or expansion joints. Cold joints shall not occur within continuous form liner pattern fields.

The form liners shall be stripped between 12 and 24 hours as recommended by the manufacturer. When stripping the forms the Contractor shall avoid creating defects in finished surface.

Wall ties shall be coordinated with the liner and form to achieve the least visible result. Place form ties at thinnest points of molds (high points of finished wall). Neatly patch the remaining hole after disengaging the protruding portion of the tie so that it will not be visible after coloring the concrete surface.

Where an expansion joint must occur at a point other than at mortar or rustication joints, such as at the face of concrete texture, which is to have the appearance of stone, consult manufacturer for proper treatment of expansion material.

Curing methods shall meet the requirements of Article 1020.13 of the "Standard Specifications" and be compatible with the desired aesthetic result. The use of curing compounds will not be allowed. No rubbing of flat areas or other repairs should be required after the form removal. The finished exposed formed concrete surfaces shall be free of visible vertical seams, horizontal seams, and butt joint marks. Grinding and chipping of finished formed surfaces shall be avoided.

**Surface finishes:** Concrete shall be finished as specified on the Contract Documents. Contractor shall provide approved aggregates meeting the grading requirements shown on the Contract Documents.

Provide concrete stain in accordance with section X5030290, "Staining Concrete Structures".

Provide clear permanent anti-graffiti coating in accordance with section X0321865, "Anti-Graffiti Protection System".

**Matte Finish.** Provide matte finish as indicated on the Contract Documents. Matte finish shall have a finished texture similar to a stucco surface. Provide a depth of finish between 1/8 in. and 1/16 in. unless directed otherwise.

**Smooth Finish.** Provide smooth finish as indicated on the Contract Documents. Smooth finish shall have a flat, even finish.

Apply a concrete surface retarder that penetrates approximately ¼ in. into the forms or concrete surface to help achieve the desired finish. Apply 2 or 3 coats to wood forms to account for absorption if necessary. Tape or caulk form joints to prevent escape of the retarder during the placing operations. Protect the form surfaces from sun and rain while exposed to the atmosphere. Re-treat form surfaces with retarder if disturbed. Protect adjacent areas of concrete not requiring exposed aggregate finish from the retarder.

Remove forms 12 to 15 hrs. after concrete placement but not before concrete has gained sufficient strength to support the self-weight of the member unless directed otherwise. Expose the aggregate for the finish immediately after form removal. Remove the grout paste covering the aggregate to be exposed by an approved method. Do not loosen the aggregate by the grout removal operation. Maintain required curing on all surfaces except for the time while the aggregate is being exposed. Cure using wet mats or membrane after the aggregate is exposed.

Repair defective areas as determined by the Engineer.

Formliner surfaces shall be cleaned and protected as recommended by the manufacturer. Do not begin cleaning until mortar joints are properly cured. Allow a minimum of 24 to 72 hours. Soak mortar joints before applying cleaner. Thoroughly flush wall and area after cleaning. Clean adjacent materials and surfaces of all foreign materials resulting from the work of this Section.

Contractor shall protect installed materials from water impinging on the visible surface, chinking, sealants joints, and from behind. Contractor shall protect installed materials from dust, dirt,

precipitation, freezing, damaged, spilled materials, and continuous high humidity until they are fully dry.

Apply clear permanent anti-graffiti coating as indicated in Section X0321865 Anti-Graffiti Protection System.

**Method of Measurement:** Form Liner Textured Surfaces will be measured for payment in place and the area computed in square feet.

**Basis of Payment:** This work will be paid for at the contract unit price per square feet for FORM LINER TEXTURED SURFACE. *The unit price shall include all equipment, materials and labor required to complete the textured surface on the exposed concrete surface.*



**50700305 HARDWARE**

Description. This work shall consist of furnishing the hardware required for Metra Forces to complete the installation of the temporary platforms. The hardware items provided by the contractor will include, but may not be limited to, the following items:

18" STEEL DRIVE DOWELS, ESTIMATED TOTAL NEEDED 210 EACH  
3/4"x7'-0" TIE RODS, ESTIMATED TOTAL NEEDED 12 EACH  
3/4"x10'-6" TIE RODS, ESTIMATED TOTAL NEEDED 105 EACH  
1/2"x6"x6" GALV. WASHER & NUT (SET), ESTIMATED TOTAL NEEDED 10 SETS  
1/2"x6"x12" GALV. WASHER & NUT (SET), ESTIMATED TOTAL NEEDED 200 SETS  
3/4"x48" CONC FORM STAKE, ESTIMATED TOTAL NEEDED 210 EACH

The contractor shall submit material specifications to owner's engineer for Metra approval prior to ordering of material. All material provided shall conform to the Metra approved list of materials, to be furnished for construction.

Basis of Payment. This work will be paid for at the contract unit price per POUND for HARDWARE, regardless of size and material.

**SECTION 550 STORM SEWER, CLASS A**

Description. This work shall be performed according to Section 550 except that the pipe material shall be Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe meeting the requirements of Section 1042.

**67201100 SEALING ABANDONED MONITORING WELLS**

Description. This work shall consist of the sealing abandoned water monitoring wells. Well casing will also be removed below proposed grade. All work shall otherwise conform to the applicable articles of Section 672.

Basis of Payment. This work will be paid for at the contract unit price per each for SEALING ABANDONED MONITORING WELLS.

**89502210 MODIFY EXISTING CONTROLLER CABINET**

Description: This work shall consist modifying the existing controller cabinet and all work described.

Construction Requirements: All work shall be completed in accordance with Section 895 of the IDOT standard specifications for the signal at Washington Street and Lake Street. Work shall include retiming of the existing signal with the changes being made to the existing equipment at the intersection. Work shall include any other incidental items not covered under other pay items as called out in the plans. All work shall be in accordance with IDOT and Lake County Requirements.

Method of Measurement: This work will be measured for final payment, in place, after the period of establishment.

Basis of Payment: This work will be paid for at the Contract unit price per each for MODIFY EXISTING CONTROLLER CABINET as specified on the plans.

**A2008748 TREE, ULMUS X FRONTIER (FRONTIER ELM), 3" CALIPER, BALLED AND BURLAPPED, MATCHING HEADS**

Description: This work shall consist of furnishing, transporting and planting the trees and shall also include all mulching, bracing, wrapping, watering, weeding, replacement of plants when required, and all work described.

Construction Requirements: All work shall be completed in accordance with Section 253 of the IDOT standard specifications and supplemental specifications.

These trees are called out along Haryan Way and should be coordinated and agreed upon by the Grayslake Park District prior to installation. Any changes in plant type or size shall be approved by the Park District.

Method of Measurement: This work will be measured for final payment, in place, after the period of establishment. Trees will be measured as each individual plant.

Basis of Payment: This work will be paid for at the Contract unit price per each for TREE, ULMUS X FRONTIER (FRONTIER ELM), 3" CALIPER, BALLED AND BURLAPPED, MATCHING HEADS as specified on the plans.

**K0013055 PERENNIAL PLANTS, WETLAND EMERGENT**

**Description:** The work shall follow the specifications as established in these special provisions. The work shall consist of procuring, transporting, installing and maintaining all plants as specified herein. This work shall also include water, weeding and replacement of plants when required; the cost of supplemental watering shall be included in PERENNIAL PLANTS, WETLAND EMERGENT. The plants included are to follow the list within these special provisions as follows:

<b>Species</b>	<b>Plants/Acre</b>
<i>Acorus calamus</i>	300
<i>Calamagrotis canadensis</i>	400
<i>Carex atherodes</i>	300
<i>Carex comosa</i>	400
<i>Carex lacutris</i>	400
<i>Carex pellita</i>	300
<i>Carex sartwellii</i>	200
<i>Carex scoparia</i>	200
<i>Carex stricta</i>	400
<i>Carex trichocarpa</i>	200
<i>Oxypolis rigidor</i>	100
<i>Polygonum coccineum</i>	100
<i>Polygonum amphibium var stipulaceum</i>	100
<i>Pontedaria cordata</i>	400
<i>Sagittaria latifolia</i>	600
<i>Sagittaria rigida</i>	500
<i>Scirpus cyperinus</i>	200
<i>Scirpus fluviatilis</i>	250
<i>Scirpus validus creber</i>	250
<i>Scutellaria epilobifolia</i>	250
<i>Sium suave</i>	150
<i>Sparganium eurycarpum</i>	600
<i>Spartina pectinata</i>	600
<b>Total plugs per acre</b>	<b>8000</b>

**PLUG PLANTING SPECIFICATIONS**

Submittals: Prior to delivery of any materials to the site, the Contractor shall submit a written description of the plant materials provided for this portion of the work to the Engineer. This description shall include any or all of the following:

- Original source of seed or other propagation materials (i.e. cuttings)
- Plant propagation records

- Name and location of plant supplier or propagation location, if different from Bidder
- Plants shall not be delivered to project site until this submittal has been approved.

Materials:

WATER: Water shall be free from oil, acid, alkali, salts, and other harmful substances. Water may be utilized from potable or non-potable sources such as lakes and ponds. LCDOT shall not be responsible for providing water. Any available water sources located on the property shall not be utilized without permission from the Engineer.

PLANTS

- All plants shall be guaranteed to be true to species name and variety. The original source of propagules (seeds, cuttings, etc.) of plants shall be guaranteed within a 200-mile radius of Lake County, Illinois.
- Any shipments/deliveries of plants shall be packaged and delivered so as to ensure the viability of the plant material. The Engineer may consider substitutions, and reserves the right to make additions and/or deletions of quantities and species. If specified plant material is unavailable, the Engineer shall approve of substitutes. Up to five (5) alternate species may be used if all of the desired species are not available.
- Adjustments will be made at no cost to the contract.
- Approval of substitutes shall in no way waive any performance requirements of the contract.
- Alternate species must fill the same ecological niche as the species they are substituting for and must be submitted and approved by the Engineer.

Plants may be delivered in one of the two following forms:

Container/Plug:

- Container with dimensions of 2.5" x 2.5" square x 3.5" deep, consisting of 32 plants per flat. Potted plants with containers equivalent to or larger are also acceptable.
- Smaller plugs (e.g., flats of 50, 72, 96 etc.) may be considered if 2.5" pots are not available.

Bare Root:

- All species desired in bare root format shall consist of only dormant tubers, corms, rhizomes, etc. No green, actively growing vegetative material will be accepted. All bare root plants shall have at least one full growing season prior to the delivery date (2+ years old).

First-Year plants will be considered if Second-Year plants are unavailable. However, at time of installation, First-Year plants shall have the root and shoot development consistent with

Second-Year plants (i.e. they shall have root systems that have filled the container and are ready for installation).

Bare root material shall be refrigerated at all time prior to installation. All plants shall be healthy, rooted out, and ready for immediate installation upon delivery. The Contractor shall replace any plants that are deemed inconsistent with these characteristics at their expense.

The planting stock shall comply with governmental regulations prevailing at the source of supply and the job site. All planting stock shall be nursery propagated in accordance with good horticultural practice. Collected stock or nursery grown wild plants will not be permitted. All planting stock shall be healthy, free of all fungi and bacterial discoloration, and deformities.

#### Construction Requirements:

#### PLANTING SCHEDULES

Supply and installation of all plant materials for this project is to occur between June 1 and July 15.

#### TRANSPORTATION AND STORAGE

Plants shall be handled, transported and stored at all times in accordance with the best horticultural practices. Plants handled otherwise will be subject to rejection by the Engineer. All plant material, except container grown, shall be dormant upon delivery to the site, unless otherwise approved by the Engineer.

Plants shall be shipped with legible labels stating correct name and size of plant, securely attached to individual plants or to bundles of like variety and size. Containers of plants shall be individually labeled as specified.

The Contractor shall maintain responsibility for caring for the plants.

Predator protection is not required. However, proposed predator protection plans may be submitted for review to the Engineer prior to installation if the Contractor deems it beneficial.

#### PLANT INSTALLATION DEPTHS

- All aquatic species shall be installed in water 1-3' deep, or as deep as feasible. All aquatic species (Lilies) shall be secured to the soil with nails or landscape staples of 8" length or greater.
- All emergent aquatic species shall be installed in water 6-18" deep depending on species. Pontedaria shall be secured to the soil with nails or landscape staples of 6" length or greater.
- All sedge meadow species shall be installed in water depths of 2-8 depending on species.
- All wet prairie species shall be installed in saturated soils at the perimeter of the wetlands or in very shallow water depending on species.



## PLANT INSTALLATION

Plants shall be installed and staked in areas to receive plugs to limit the opportunity for weedy and invasive species to establish. Plugs shall be installed through slits cut into the blanket where necessary.

**SITE CONDITIONS**-The Contractor shall examine and verify the acceptability of the job site. The Contractor shall correct any unacceptable conditions if conditions detrimental to plant growth are encountered such as rubble fill, adverse drainage conditions, or obstructions.

**WATERING**-Plugs shall be watered immediately upon installation. Supplemental watering of planted areas shall be performed at the discretion of the Engineer and included in the cost of PERENNIAL PLANTS, WETLAND EMERGENT. Watering may be necessary in order to conform to the guarantee requirements as described in this section.

### Acceptance Criteria:

For acceptance, areas planted with plugs shall meet the following conditions at the end of each growing season, the end of the Three Year Maintenance and Monitoring Period and upon final acceptance:

At the end of each MMP year and upon final acceptance, at least 90% of the plugs will be present and thriving.

At the end of each MMP year and upon final acceptance, no more than 0.5 square meters in size shall be devoid of vegetation at any time and upon final acceptance.

At the end of each MMP year and upon final acceptance, the area shall be free of invasive on or non-native species, including but not limited to: Cattail (*Typha* spp.), Reed Canary Grass (*Phalaris arundinacea*), Purple Loosestrife (*Lythrum salicaria*), Common Reed (*Phragmites australis*), and Sandbar Willow (*Salix exigua*).

**Basis of Payment:** The work shall be measured and paid for by ACRE of PERENNIAL PLANTS, WETLAND EMERGENT for the types specified.

**K0029632 WEED CONTROL, NON-SELECTIVE AND NON-RESIDUAL**

Description: This work shall consist of the application of a non-selective and non-residual herbicide to kill all existing vegetation at designated areas along highway roadsides.

Materials: The non-selective and non-residual herbicide shall have the following formulation:

A. Active Ingredient	
*Glyphosate, N- (phosphonomethyl) glycine, in the form of its isopropylamine salt	41.00%
B. Inert Ingredients (including surfactant)	<u>59.00%</u>
	TOTAL 100.00%

\*Contains 480 grams per liter or 4 pounds per U.S. gallon of the active ingredient Glyphosate, in the form of its isopropylamine salt. Equivalent to 356 grams per liter or 3 pounds per U.S. gallon of the acid, glyphosate.

The Contractor shall submit a certificate, including the following, prior to starting work:

1. The chemical names of the compound and the percentage by volume of the ingredients which must match the above specified formulation.
2. A statement that the material is in a solution which will form a satisfactory emulsion for use when diluted with water for normal spraying conditions.
3. A statement that when mixed with water, will be completely soluble and dispersible and remain in suspension with continuous agitation.
4. A statement describing the products proposed for use when the manufacturer requires that surfactants, drift control agents, or other additives be used with the product. These tank mix additives shall be used as specified by the manufacture. Required additives will not be paid for separately.

**All material shall be brought to the spray area in the original, unopened containers supplied by the manufacturer.**

Schedule: Spraying will not be allowed when temperatures exceed 90° F or under 60° F, when wind velocities exceed fifteen (15) miles per hour, when foliage is wet or rain is eminent, when visibility is poor or during legal holiday periods.

Application Rate: The non-selective and non-residual herbicide shall be applied at the rate of one (1) gallon per acre.

One (1) gallon of the herbicide shall be diluted with a minimum of fifty-five (55) gallons of water and applied as a mixture. Water for dilution of the mixture will not be paid for separately.

Method of Measurement: Weed Control, Non-selective and Non-residual will be measured for payment in gallons of undiluted herbicide as specified. The gallons for payment will be

determined based on the gallons specified on the label attached to the original container supplied by the manufacturer.

Basis of Payment: Weed Control, Non-Selective and Non-residual will be paid for at the contract unit price per gallon for WEED CONTROL, NON-SELECTIVE AND NON-RESIDUAL. Water for dilution of the mixture and additives required for application will not be paid for as separate items, but the costs shall be considered as included in the contract unit price for Weed Control, Non-selective and Non-residual, and no additional compensation will be allowed.

**LR503200 LOAD CHARGE**

Effective: February 18, 2013

**Description:** This work shall consist of transporting loads that have been rejected by CCDD facilities back to the project site, and stockpiling the material on the project site at a location specified by the Engineer.

**General:** The work shall be performed in accordance with the applicable portions of the REMOVAL AND DISPOSAL OF SURPLUS, UNSTABLE, AND UNSUITABLE MATERIALS AND ORGANIC WASTE special provision and the following:

*This pay item is being provided to establish a unit price for transportation costs in the event that material is rejected at a CCDD facility and must be returned to the project site. Work shall include transporting the rejected material back to the project site, furnishing and installing plastic sheeting for the material to be placed on to prevent contact with the existing ground, placing the material in a pile or separated piles as directed by the Engineer, and covering the material to protect it from the weather. An excavator or loader may be required push the material into a tighter pile or spread the material on the plastic.*

*After further analysis by the Engineer of the rejected material, additional work effort will be necessary and will be paid separately according to Art. 109.04.*

**Method of Measurement:** Payment shall be made per 20 cu yd load of material that is either en route to a CCDD facility, or at a CCDD facility and must be returned to the project site.

**Basis of Payment:** LOAD CHARGE will be paid for at the contract unit price per load. A load shall consist of 20 cubic yards of rejected material. If the truck capacity is greater or less than 20 cubic yards, the load shall be adjusted proportionally. (A truck with a 12 cu yd capacity would counts as 12/20 or 0.60 loads).

Payment will be made for all trucks traveling from the CCDD site back to the project site, and for all trucks that were en route to the CCDD site and were turned back to the project site.

The unit price shall include all equipment, materials and labor required to transport and stockpile the rejected loads.

**X0321865 ANTI-GRAFFITI PROTECTION SYSTEM**

**Description:** This work shall consist of furnishing, and applying an anti-graffiti coating on all exposed faces of concrete structures. Anti-graffiti coating shall be applied to the following exposed concrete surfaces:

1. Retaining Wall Stone Pattern Formliner
2. Retaining Wall Panel Insert Formliner

**Materials:** Anti-graffiti protection materials may be obtained from the following suppliers:

Rainguard International 1079 Culpepper Drive Conyers, GA 30094 Phone # 1-866-989-5159 <a href="http://www.rainguard.com/">http://www.rainguard.com/</a>	Surtec, Inc. 1880 N MacArthur Drive Tracy, CA 95376 Phone #1-209-820-3700 <a href="http://www.surtecsystem.com/">http://www.surtecsystem.com/</a>	United Coatings 1465 Pipefitter Street Charleston, SC 29405 Phone #1-855-817-3082 <a href="http://www.quest-cp.com/trusted-brands/unitedcoatings">http://www.quest-cp.com/trusted-brands/unitedcoatings</a>
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**General:** The anti-graffiti protection system shall consist of a permanent, color stable, UV, stain, chemical and abrasion resistant coating. The coating shall be applied according to the Manufacturer's specifications:

**PART 1 GENERAL**

**SECTION INCLUDES:** Clear anti-graffiti coating for exterior surfaces.

**SYSTEM DESCRIPTION:**

- A. To provide a tough and durable Anti-Graffiti Coating finish. A cross-linking co-polymer material coating that dries clear, non-yellowing with low-luster sheen.
- B. All products VOC – Used materials must contain no more than 95 grams per liter VOC.

**SUBMITTALS:**

- A. Product Data: Manufacturer's current technical data sheets for materials, and schedule indicating:
  1. Recommended waterproof coating serving as base layer of system
  2. Number of coats required for subsequent coating types
- B. Manufacturer's field reports: Indicate installation procedures, coverage, quantities, progress, unacceptable conditions and methods of resolution.

- C. Maintenance Data: Provide Manufacturer's recommended maintenance procedures, including instructions for graffiti removal, recommended procedures for re-application of intermediate coatings and periodic maintenance of coating.

**QUALITY ASSURANCE:**

- A. Test Section(s): Before full-scale application, the product shall be applied to a test section.
1. Review Manufacturer's product data sheets to determine suitability of each product for each surface.
  2. Apply products using Manufacturer-approved application methods, determining actual requirements for surface preparation, coverage rate, number of coats, and application procedures.
  3. After 48 hours, review effectiveness of protection, compatibility with substrates, and ability to achieve desired results.
  4. Obtain the approval of the Engineer of workmanship, color, and texture before proceeding with work.
  5. Test Section(s): Inconspicuous sections of actual construction.
    - a. Location and number: As selected by Engineer
    - b. Size: Approximately two square feet
    - c. Repair unacceptable work to the satisfaction of the Engineer
- B. Pre-Installation Meetings:
1. Before Application: The Contractor and the Manufacturer's representative shall inspect surfaces to be treated, noting in writing to the Engineer deficiencies or flaws in the substrate construction which would affect the performance or appearance of the coating.
  2. Beginning of Application: The Manufacturer's representative shall assure utilization of proper equipment, verify material quantities, and supervise material application techniques.
- C. The Contractor shall comply with recommendations and instructions set forth by Manufacturer as part of Manufacturer's service in addition to complying with the terms of the warranty.
- D. Installer Qualifications: Minimum 5 years of experience regularly engaged and specializing in the application of specialty surface treatments to exterior wall substrates.
- E. Do not proceed with material application until all deficiencies noted in pre-application inspection report have been corrected.
- F. Notify the Manufacturer at least 72 hours before starting application.

**DELIVERY, STORAGE, AND HANDLING:**

- A. Deliver materials in original sealed containers clearly marked with Manufacturer's name, type of material, and batch number.

- B. Inspect the materials upon delivery to assure that specified products have been received.
- C. Store materials where temperatures are not less than 45 degree F.
- D. Use all means necessary to protect material before, during, and after installation, and to protect work of other trades.

**ENVIRONMENTAL REQUIREMENTS:**

All materials shall comply with current Federal and State environmental requirements. Used materials must contain no more than 95 grams per liter VOC.

**WARRANTY:**

- A. Manufacturer shall provide a written warranty for 5 years to include material only, when, said materials are applied in accordance with manufacturer's guidelines. Please refer to manufacturer for warranty policy.
- B. Before final application for payment will be approved, final closeout submittals must include written manufacturer's warranty.

**PART 2 PRODUCTS**

**MATERIALS:** Please refer to manufacturer's published data bulletins for applications and installation recommendations.

VandIGuard Non-sacrificial

5 Year material only warranty

**PART 3 EXECUTION**

**EXAMINATION:**

- A. Verify that surfaces to be coated are in proper condition.
  - 1. New substrates: Cured 30 days before application.
  - 2. Cured substrates: Allowed to dry three to seven days following rainfall before application.
  - 3. Substrate moisture content no higher than 15 percent as registered on an electronic moisture meter.
- B. Do not apply to surfaces below 45 degrees F or above 90 degrees F. Do not apply in the direct sun.
- C. Where freezing conditions have existed before application, allow adequate time for building to thaw.
- D. Do not begin until the test section(s) has been approved by Engineer.

**PREPARATION:**

- A. Remove dirt, dust, oil, grease, and other contaminants that would interfere with penetration or performance of products; where cleaners are required, use products recommended by Manufacturer; rinse thoroughly and allow surface to dry completely.
- B. Surfaces shall be structurally sound, dry, clean and free of dust, dirt, grime, oil, scale, rust, silicones, curing compounds, alkali, add residues, etc...
- C. Prevent overspray, wind drift and splash onto surfaces not to be treated.
- D. Protect windows and work of other trades against damage by coatings, whether to be coated or not.
- E. Protect plant life against damage from coatings.

**APPLICATION:**

- A. Apply materials according to the Manufacturer's recommendations and when substrate surface temperature is above 45 degrees F. Follow instructions in Manufacturer's current technical data sheet for general information and coverage rates.
- B. Mix materials according to the Manufacturer's instructions; do not dilute unless permitted by Manufacturer.
- C. Spray apply water repellent using high-volume, low-pressure spray equipment. Pressure not to exceed 60 psi. A Hudson or garden-type sprayer can be used for small applications.
- D. Clean all drips, runs, and overspray residue while still wet.
- E. Allow coating to dry and become clear before applying subsequent coats. Achieve a uniform pinhole free, continuous film.
- F. During process of work, remove discarded coating materials, rubbish, cans, and rags at end of each workday.

**FIELD QUALITY CONTROL:**

Request the Manufacturer's authorized field representative to verify that installed products comply with Manufacturer's requirements and with the standards established by the test section(s) approved by the Engineer.

**ADJUSTING, CLEANING AND PROTECTION:**

- A. Upon completion of work, remove protective coverings.
- B. If surfaces that should have been protected from damage by this work have been damaged; clean, repair or replace to the satisfaction of the Engineer.



- C. Repair or replace damaged treated surfaces.
- D. Protect completed work from damage during construction.

**Method of Measurement:** This work will be measured for payment in place and the area covered by the anti-graffiti protection system shall be calculated in square feet.

**Basis of Payment:** This work will be paid for at the contract unit price per square foot of ANTI-GRAFFITI PROTECTION SYSTEM. *The unit price shall include all labor, equipment and materials required to furnish and apply the anti-graffiti coating to the designated surfaces. The unit price shall also include supplying the Manufacturer's technical representative and preparing the warranty application.*

**X0322936 REMOVE EXISTING FLARED END SECTION**

Description. This work shall consist of the removal of existing flared end sections (FES) at the locations shown on the plans and as directed by the Engineer. Existing FESs shall be removed so that all FESs considered suitable by the Engineer for reuse shall be salvaged. All work shall otherwise conform to the applicable articles of Section 551.

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

**X0323002 TEMPORARY ELECTRIC SERVICE CONNECTION**

Description. This work shall consist of providing all materials for connecting to the existing electrical feed and wiring to provide the temporary light poles at the Metra platforms with power. Metra forces will do all electrical work for the connection. All work shall otherwise conform to the applicable articles of Section 803.

The following items will need to be provided by the contractor for Metra installation:  
QUAZITE HANDHOLES 13"X24" – ESTIMATED TOTAL NEEDED 3

The contractor shall submit material specifications to owner's engineer for Metra approval prior to ordering of material. All material provided shall conform to the Metra approved list of materials, to be furnished for construction.

Metra Forces will salvage all materials provided; if applicable, contractor shall neatly pile the materials for salvaging.

Basis of Payment. This work will be paid for at the contract unit price per EACH for TEMPORARY ELECTRIC SERVICE CONNECTION, regardless of size and material.

**X0323523 REMOVE TEMPORARY LIGHTING**

Description. This work shall consist of the removal of all temporary light poles and fixtures, excepting that which Metra Forces elect to salvage. All work shall otherwise conform to the applicable articles of Section 841 & 842.

Basis of Payment. This work will be paid for at the contract unit price per lump sum for REMOVE TEMPORARY LIGHTING, regardless of size and material.

**X0325346 RAILROAD TRACK**

**Description.** This work shall consist of furnishing new 136 lb. rail required for use by WCL forces for the cutovers from the existing alignment to the temporary shoofly at the beginning of the project and back to the permanent alignment near the end of the project. The rail shall be furnished in advance of any work to be completed. A total of 176 lineal feet of new 136 lb. rail is required. The 176 lineal feet of rail corresponds to 88 Track Feet.

The contractor shall submit material specifications to owner's engineer for approval prior to ordering of material. All material provided shall conform to Buy America requirements as covered by Article 106.01 of the Standard Specifications.

**Method of Measurement and Basis of Payment:** This work will be paid for at the contract unit price per TRACK FOOT for RAILROAD TRACK, regardless of size and material.

**X0325714 FLASHING BEACON, POST MOUNTED, SOLAR POWERED INSTALLATION**

Description. This work shall consist of furnishing, installing and removing the Flashing Beacon, Post Mounted, Solar Powered materials as needed for the Temporary Crossings at the WCL Main and Temporary Shoofly and the Roadway Runaround.

The contractor shall submit material specifications to owner's engineer for approval prior to ordering of material. All material provided shall conform to the ICC standard detail shown on the plans.

WCL Forces will install electrical feed and/or interconnection for the Flashing Beacon. Contractor will remove the Flashing Beacon and posts when no longer needed at the Roadway Runaround.

Basis of Payment. This work will be paid for at the contract unit price per EACH for FLASHING BEACON, POST MOUNTED, SOLAR POWERED INSTALLATION, regardless of size and material.

**X0326144 TACTILE/DETECTABLE WARNING SURFACE**

Description. This work shall consist of furnishing TACTILE/DETECTABLE WARNING SURFACE materials to Metra forces for installation on the Temporary Platform at the Metra Grayslake Station. The TACTILE/DETECTABLE WARNING SURFACE will be installed by Metra forces.

Materials. The TACTILE/DETECTABLE WARNING SURFACE shall be a flexible material with adhesive backing with stainless steel anchors and shall be the color yellow. All materials shall comply with all ADA accessibility guidelines and/or requirements.

The panels shall be the RediMat™ product as supplied from the following manufacturer:

Detectable Warning Systems, Inc.

9310 Old Kings Rd. South

Suite 1702

Jacksonville, FL 32257

866.999.7452

<http://www.detectable-warning.com/products-redimat.shtml>

The contract quantity includes a number of extra tiles in order to promptly address and maintain the platform tactile surface. If any of the tactile panels peel from the surface or become damaged such that there is a tripping hazard, the contractor shall remove the tile and notify Metra immediately to replace with a new tactile panel.

Basis of Payment. This work shall be paid for at the contract unit price per SQUARE FOOT (SQ FT) for TACTILE/DETECTABLE WARNING SURFACE, regardless of size and material.

**X0326358 STORM WATER TREATMENT SYSTEM**

Description: This work shall consist of designing, supplying and installing specifically called out model(s) of stormwater pollutant separation unit(s) for the reduction without resuspension of total suspended solids and free floating oils.

SEPERATOR UNIT

See Stormwater Treatment System Specifications.

DESIGN

- A. The supplier shall provide calculations and shop drawings signed and sealed by an Illinois Licensed Professional Engineer demonstrating that the specified models meet the performance requirements specified by the Engineer for each structure.
- B. The separator should be equipped with an internal high flow bypass that regulates the flow rate into the treatment chamber and conveys high flows directly to the outlet so the scour and/or re-suspension of material previously collected in the separator does not occur. External bypasses are not acceptable.
- C. The separator should be maintained from the surface via one access point.
- D. The stormwater pollutant separation unit(s) shall be clearly identified for ease of maintenance.
- E. The owner shall be provided with maintenance instructions.

EQUIVALENCE

- A. The specified unit(s) has been modeled to exceed the permit requirements of the local or regional stormwater authority. Simple substitution by dimensional equivalents shall not be considered equivalent as requests for substitution shall include full independent site specific modeling for review by the specifying engineer.
- B. Due to the permit requirements for stormwater remediation any substitution from the specified product may require a new submittal. Any costs incurred or time delay caused by this resubmittal shall be the responsibility of the Contractor.

Basis of Payment: All work will be paid for at the contract unit price per each for STORM WATER TREATMENT SYSTEM, regardless of size/model, which price shall be payment in full for all material, labor and any other items required to complete the work.



## **STORMWATER TREATMENT SYSTEM SPECIFICATIONS A**

### **PART 1.00 GENERAL**

#### **1.1 DESCRIPTION**

A. Work included:

The Contractor, and/or a manufacturer selected by the Contractor and approved by the Engineer, shall furnish all labor, materials, equipment and incidentals required and install all precast concrete stormwater treatment systems and appurtenances in accordance with the Drawings and these specifications. Substitutions for the specified product(s) will be considered only if the proposed alternate meets or exceeds the performance criteria as listed in section 2.2 of this specification. Any proposed substitutions must be reviewed by the engineer and submitted to the governing regulatory agency for final approval.

#### **1.2 QUALITY CONTROL INSPECTION**

- A. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection by the Engineer. Such inspection may be made at the place of manufacture, or on the work site after delivery, or at both places, and the sections shall be subject to rejection at any time if material conditions fail to meet any of the specification requirements, even though sample sections may have been accepted as satisfactory at the place of manufacture. Sections rejected after delivery to the site shall be marked for identification and shall be removed from the site at once. All sections which have been damaged beyond repair during delivery will be rejected and, if already installed, shall be repaired to the Engineer's acceptance level, if permitted, or removed and replaced, entirely at the Contractor's expense.
- B. All sections shall be inspected for general appearance, dimensions, soundness, etc. The surface shall be dense, close textured and free of blisters, cracks, roughness and exposure of reinforcement.
- C. Imperfections may be repaired, subject to the acceptance of the Engineer, after demonstration by the manufacturer that strong and permanent repairs result. Repairs shall be carefully inspected before final acceptance. Cement mortar used for repairs shall have a minimum compressive strength of 4,000 psi (28 MPa) at the end of 7 days and 5,000 psi (34 MPa) at the end of 28 days when tested in 3-inch (76 mm) diameter by 6-inch (152 mm) long cylinders stored in the standard manner. Epoxy mortar may be utilized for repairs.

### 1.3 SUBMITTALS

#### Shop Drawings

The Contractor shall be provided with dimensional drawings and, when specified, utilize these drawings as the basis for preparation of shop drawings showing details for construction, reinforcing, joints and any cast-in-place appurtenances. Shop drawings shall be annotated to indicate all materials to be used and all applicable standards for materials, required tests of materials and design assumptions for structural analysis. Shop drawings shall be prepared at a scale of not less than 3/16-inches per foot (1:75). Six (6) hard copies of said shop drawings shall be submitted to the Engineer for review and approval.

### PART 2.00 PRODUCTS

#### 2.1 MATERIALS AND DESIGN

- A. Concrete for precast stormwater treatment systems shall conform to ASTM C857 and C478 and meet the following additional requirements:
1. In all cases the wall thickness shall be no less than the minimum thickness necessary to sustain HS20-44 (MS18) loading requirements as determined by a Licensed Professional Engineer.
  2. Sections shall have tongue and groove or ship-lap joints with a butyl mastic sealant conforming to ASTM C 990.
  3. Cement shall be Type I, II, or III Portland cement conforming to ASTM C 150.
  4. All sections shall be cured by an approved method. Sections shall not be shipped until the concrete has attained a compressive strength of 4,000 psi (28 MPa) or other designate suitable handling strength.
  5. Pipe openings shall be sized to accept pipes of the specified size(s) and material(s), and shall be sealed by the Contractor with a hydraulic cement conforming to ASTM C 595M
- B. All internal components shall be PVC per ASTM D1785, and aluminum alloy 5052-H32 plate in accordance with ASTM B 209.
- C. Brick or masonry used to build the manhole frame to grade shall conform to ASTM C 32 or ASTM C 139 and shall be installed in conformance with all local requirements.
- D. Casting for manhole frames and covers shall be in accordance with ASTM A48, CL.35B and AASHTO M105. The manhole frame and cover shall be equivalent to Campbell Foundry Pattern #1009A.
- E. A bitumen sealant in conformance with ASTM C 990 shall be utilized in affixing the aluminum bays to the concrete vault.

2.2 PERFORMANCE

Each stormwater treatment system shall have treatment, sediment storage, and oil storage capacities equal to or greater than that shown in Table 2.1 as specified on the project plans. For the purpose of determining equivalency, the treatment capacity shall be defined as the flow rate at which the stormwater treatment system removes 80% of an unground silica sample having an average particle size equal to or less than 240 microns. Treatment capacity shall be additionally defined as the maximum flow rate prior to which bypass of any flow occurs.

Table 2.1

Treatment Capacity		Sediment Storage		Oil Storage	
cfs	l/s	yd <sup>3</sup>	m <sup>3</sup>	gal	Liter
0.55	15.6	0.5	0.4	75.4	285.4
1.2	34.0	0.9	0.7	137.1	518.9
2.2	62.3	1.5	1.1	214.2	810.8
3.7	104.8	2.1	1.6	308.4	1167.6
5.6	158.6	2.8	2.1	412.0	1559.5
8.1	229.4	3.7	2.8	544.2	2059.9

Each stormwater treatment system shall provide documented full-scale testing that corroborates the capacities as listed in Table 2.1 and defined above. Said documentation shall include at a minimum testing for removal capabilities and sediment wash-out characteristics at the treatment capacities listed in Table 2.1.

Each stormwater treatment system shall have the capability of bypassing high flow internally as well as controlling flow through the treatment chamber so as to avoid wash-out of previously captured pollutants under high flow conditions.

Each stormwater treatment system shall include a circular chamber with a tangential inlet to induce a swirling flow pattern within the treatment chamber. The outlet from the treatment chamber shall be located in the center of the chamber so as to maximize the particle flow path within the treatment system.

Each stormwater treatment system shall be of a hydraulic design that includes flow controls designed and certified by a professional engineer using accepted principles of fluid mechanics that raise the water surface inside the tank to a pre-determined level in order to prevent the reentrainment of trapped floating contaminants.

Each stormwater treatment system shall be designed to not allow surcharge of the upstream piping network during dry weather conditions.

Each stormwater treatment system shall be contained within one concrete manhole structure.

## MANUFACTURER

The manufacturer of said system shall have been regularly engaged in the engineering design and production of systems for the physical treatment of stormwater runoff for 15 years.

## PART 3.00 EXECUTION

### 3.1 INSTALLATION

- A. Each Stormwater Treatment System shall be constructed according to the sizes shown on the Drawings and as specified herein. Install at elevations and locations shown on the Drawings or as otherwise directed by the Engineer.
- B. Place the precast base unit on a granular subbase of minimum thickness of six inches (152 mm) after compaction or of greater thickness and compaction if specified elsewhere. The granular subbase shall be checked for level prior to setting and the precast base section of the trap shall be checked for level at all four corners after it is set. If the slope from any corner to any other corner exceeds 0.5% the base section shall be removed and the granular subbase material re-leveled.
- C. Prior to setting subsequent sections place bitumen sealant in conformance with ASTM C 990-91 along the construction joint in the section that is already in place.
- D. After setting the precast roof section of the stormwater treatment system, set precast concrete manhole riser sections, to the height required to bring the cast iron manhole covers to grade, so that the sections are vertical and in true alignment with a ¼-inch (6 mm) maximum tolerance allowed. Backfill in a careful manner, bringing the fill up in 6-inch (152 mm) lifts on all sides and compacting the granular bedding to 95% Standard Procter Density per ASTM D698. If leaks appear, clean the inside joints and caulk with lead wool to the satisfaction of the Engineer. Precast sections shall be set in a manner that will result in a watertight joint. In all instances, installation of Stormwater Treatment Systems shall conform to ASTM specification C 891 "Standard Practice for Installation of Underground Precast Utility Structures".
- E. Holes made in the concrete sections for handling or other purposes shall be plugged with a nonshrink grout or by using grout in combination with concrete plugs.
- F. Where holes must be cut in the precast sections to accommodate pipes, do all cutting before setting the sections in place to prevent any subsequent jarring which may loosen the mortar joints. The Contractor shall make all pipe connections.

## **STORMWATER TREATMENT SYSTEM SPECIFICATIONS B**

### **PART 1 - GENERAL**

#### **1.01 SCOPE**

- A. Work described in this section includes furnishing all labor, equipment, materials, tools and incidentals required for a complete and operable installation of the Hydrodynamic Vortex Separator (HVS) stormwater treatment system as shown on the drawings and specified herein.
- B. The manufacturer shall design and supply the equipment listed herein and the Contractor shall install the equipment in accordance with the manufacturer's Handling, Storage, and Installation Instructions.

#### **1.02 GENERAL REQUIREMENTS**

- A. The HVS shall use an induced vortex to separate pollutants from stormwater runoff. The system shall be self-activating with no mechanical parts or external power requirements.
- B. Upon request, independently certified performance data and references shall be made available to the Engineer of Record for use in determining that the HVS meets the design criteria and performance requirements stated herein.

#### **1.03 SUBMITTALS**

- A. Submittals shall be provided and shall include the following:
  - i. Site plan showing location and orientation of proposed pipe sizes, connections and excavation limits.
  - ii. Product installation drawings showing plan and elevation views with water elevations for the flow conditions specified herein.
  - iii. Performance data as required in Part 2.
  - iv. Inspection and maintenance procedures with accompanying maintenance video and upon request, three references for verifying successful completion of the maintenance procedures and associated costs.

#### **1.04 QUALITY ASSURANCE**

- A. The HVS shall be manufactured under the direction of an ISO 9001 Certified Company.
- B. Inspection

The HVS shall be subject to inspection by the Engineer of Record or the owner's representative at either the place of manufacture or the project site. Any and all observed defects shall be repaired to the satisfaction of the owner or owner's representative or replacement shall be made available.

C. Warranty

The manufacturer shall guarantee the HVS from defects in materials and workmanship for a period of two years following installation. If during the warranty period defects in materials or workmanship are noted, then the manufacturer shall be promptly notified. The decision to repair or replace affected units shall be made at the discretion of the manufacturer.

D. Patent Indemnity

Upon request, the manufacturer shall warrant that the HVS does not infringe upon or violate any patent, copyright, trade secret or any other proprietary right of any third party and shall indemnify the Owner against any loss, cost, expense or liability arising out of such claim whether or not such claim is successful.

E. Certificate of Compliance

Upon request, the manufacturer shall provide a "Letter of Certification" to certify that the HVS adheres to the specifications required herein and complies with the project's stormwater management permit.

**1.05 MANUFACTURER**

- A. The HVS shall be supplied by a manufacturer regularly engaged in such work who has furnished similar installations that have been in successful and continuous operation for a minimum period of five years. The manufacturer shall be a Stormwater Equipment Manufacturer Association (SWEMA) member.
- B. The HVS shall be certified by an acceptable State agency, such as a State Department of Environmental Protection (DEP) or industry verification or assessment agency (e.g.: ETV, NJCAT, NETE).

**PART 2 – STORMWATER HVS**

**2.01 General**

- A. The HVS shall use a tangential inlet pipe to establish rotational flow within a cylindrical vortex chamber or be able to treat the Water Quality Flow Rate stated herein without re-suspending and releasing captured pollutants. The HVS shall not release captured floating pollutants during surcharge conditions.
- B. The HVS shall not exceed the pressure drop (headloss) for the design flow rates specified herein as determined by ASTM C1745 / C1745M – 11.
- C. The HVS shall fit within the limits of excavation (area and depth) as shown in the project plans and will not exceed the dimensions for the design flow rates specified herein.
- D. The storage capacities for pollutants that settle (sediment) and float (oil) shall not be less than the volumes listed in Table 1. The HVS shall operate as intended and perform as specified herein as pollutants accumulate. The storage capacity for pollutants that settle

shall not reduce the volume required in the HVS for separation and for preventing re-suspension and washout, or reduce the floatables storage volume capacity.

- E. Minimum 24-inch openings shall provide access to the sediment storage volumes from the surface for inspection and maintenance. Two access openings shall be provided for systems larger than 4 feet in diameter or 4 feet square. Removal of pollutants from the HVS shall be possible without requiring confined space entry.

## **2.02 Performance**

- A. Performance of the HVS shall be based on independent full-scale laboratory and/or field testing and shall adhere to the Performance Specifications listed in Table 1. The laboratory testing used as the basis of product performance shall be undertaken in accordance with testing protocols approved or endorsed by SWEMA or acceptable State agency, such as a State Department of Environmental Protection (DEP) or recognized verification agency (e.g.: ETV, NJCAT, NETE).
- B. Performance of the HVS shall be based on treating the Water Quality Flow rate (WQF) without internally bypassing and without re-suspension and washout of captured pollutants (scour). The Maximum Treatment Flow Rate(s) (MTFR-50 and/or MTFR-100) shall be greater than or equal to the WQF. The HVS shall remove greater than or equal to 80% of TSS based on the Target Particle Size (TPS) of 50 microns and/or 100 microns at MTFR-50 and MTFR-100, respectively.
- C. The HVS shall treat all flows without internally bypassing up to the Peak Treatment Flow Rate (PTFR). Full-scale independent laboratory scour testing shall demonstrate effluent control of less than or equal to 20 mg/L for all flows up to 150% of MTFR-100 without internal or external bypass.
- D. The HVS shall be capable of capturing and retaining fine silt and sand size particles. Analysis of captured sediment from full-scale field installations shall demonstrate particle sizes predominately in the 20-micron range.
- E. The HVS shall capture and retain 100% of all floating trash and debris and remove greater than 80% of hydrocarbons up to its rated storage capacities under conditions of a catastrophic spill such as might be experienced in an automobile or truck accident spill like conditions.

Table 1.

Hydrodynamic Vortex Separator Performance Specifications								
Diameter (feet)	Max Depth <sup>1</sup> (feet)	MTFR-50 <sup>2</sup> (cfs)	MTFR-100 <sup>2</sup> (cfs)	Scour Flow Rate <sup>3</sup> (cfs)	PTFR <sup>4</sup> (cfs)	Headloss <sup>5</sup> (feet)	Oil Storage Capacity <sup>6</sup> (gal.)	Sediment Storage Capacity <sup>6</sup> (gal.)
4	4.1	1.2	1.6	2.4	3	0.68	70	141
6	5.9	3.4	4.3	6.5	8	0.95	216	424
8	7.7	6.9	8.8	13.3	15	1.1	540	939
10	9.4	12	15	23.3	25	1.2	1,050	1,757
12	11.2	19	24	38	38	1.4	1,770	2,970

Notes:

1. Depth measurement is from the outlet invert to top of the bottom slab.
2. MTFR-50 and MTFR-100 are the Maximum Treatment Flow Rates for removing target of 50 microns and 100 microns, respectively.
3. Scour Flow Rates are based on testing that demonstrates retention of captured sediment at a D50 of 100. Effluent concentrations shall not exceed 20 mg/L.
4. PTFR or Peak Treatment Flow Rate is based on the HVS maintaining positive removal efficiencies and headlosses no greater than those listed above for each model.
5. Headlosses are the difference in water elevations upstream and downstream of the HVS as determined by ASTM C1745 / C1745M – 11. The headlosses listed above for any particular model are for that HVS operating at the Peak Treatment Flow Rate.
6. Refer to 2.01 E and F.

**PART 3 – EQUIPMENT**

- A. The HVS shall be manufactured with materials typically used in stormwater drainage systems that have a minimum life expectancy of 30 years.
- (i) Materials of construction shall be cross-linked polyethylene (XLPE) and/or Type 304 stainless steel or carbon steel powder coated in accordance with ASTM 775/ ASTM A775M with a resulting thickness of 8-12 mils. All components shall be designed to withstand all normal loadings associated with fabrication, shipping, site installation, and normal operation of the equipment.
  - (ii) Precast shall be manufactured with concrete that has attained a compressive strength of 4,000 psi after 28 days. The structure shall be reinforced to withstand an HS20-44 loading. Shiplap joints shall be sealed with butyl rubber mastic sealant conforming to ASTM C990. Slab tops shall be suitably reinforced and provided with manhole openings and covers as required. The cast iron manhole frames and covers shall be sized as per the manufacturer’s drawings and shall



be in accordance with ASTM A48, CL.35B and AASHTO M105. The masonry fixing bolts shall be Type 304 stainless steel.

- (iii) All piping connections and ancillary items not listed herein shall be provided by the Contractor.

#### **PART 4 - EQUIPMENT DELIVERY**

- A. The HVS components shall be delivered within six weeks of date of approved technical submittal.
- B. The HVS components shall be preassembled and delivered to the site fully fabricated and ready for the final assembly.
- C. Off-loading, storage, and installation shall be by the Contractor.
- D. The Contractor shall inspect and provide signed acceptance of equipment prior to unloading, or notify the manufacturer of any damage to equipment to effect proper remedial action. Failure to notify the manufacturer of damage to equipment prior to unloading will void all warranties pertaining to subject equipment.

#### **PART 5 - EQUIPMENT INSTALLATION**

- A. The system shall be installed in strict accordance with the site plans, and the manufacturer's general arrangement drawings and Handling, Storage and Installation Instructions. The Contractor shall be responsible for installing the equipment and all necessary site connections.
- B. The Manufacturer shall be notified immediately of any equipment which is damaged during unloading, storage, or installation. The damaged equipment shall be repaired or replaced at the discretion of the manufacturer and entirely at the Contractor's expense.
- C. The precast concrete structure shall be set on a granular or compacted sand sub-base in accordance with local requirements for standard manhole installation. In no instances shall the compacted sub-base material have a thickness of less than 12 inches.
- D. The precast concrete structure shall be set level and plumb to within 0.5%.
- E. Non-shrink grout or hydraulic cement conforming to ASTM C 595 shall be used to provide a water tight seal in the lift holes, any drain holes and around the concrete knock-outs for the inlet and outlet pipes.
- F. The Contractor shall, at the discretion of the owner or owner's representative, test the concrete structure for water tightness before backfilling.

**X0326679 TEMPORARY STORM SEWER PLUGS, 36"**

Description. This work shall consist of the plugging of proposed storm sewer by a temporary means that can be removed without damaging the storm sewer during future contracts. All work shall be according to the requirements of Section 550 and as directed by the Engineer.

Construction Requirements. Plugging of the proposed storm sewer shall satisfy the requirements of Section 550.05 except that the use of poured-in-place (Class SI) concrete will not be permitted. Precast concrete plugs are acceptable.

A 4" X 4" timber post or similar shall be installed at the location of the plug prior to backfilling the sewer to allow for easy location of the plug during future excavation. The post shall terminate one foot below finished grade and the top two feet shall be painted green on all four sides indicating sewer.

Method of Measurement.

Plugging of proposed storm sewer at the locations shown on the plans will be measured for payment in place per each temporary pipe plug used.

Any necessary work needed to make the plug temporary and to allow it to be removed without damaging the proposed storm sewer shall be considered included in the cost for Temporary Pipe Plug and will not be measured for separate payment.

Should the contractor elect to install temporary pipe plugs to facilitate staged construction of storm sewer pipes and/or culverts, this work will not be measured for payment.

Basis of Payment. The temporary plugging of proposed storm sewer shall be paid for at the contract unit price per each for TEMPORARY STORM SEWER PLUGS of the size specified, which price shall include all materials necessary to make the plug removable without damaging the storm sewer.

**X0326899 SOLAR-POWERED FLASHING BEACON ASSEMBLY (COMPLETE)**

**Description:** This work shall consist of furnishing and installing the Rectangular Rapid Flashing Beacon (RRFB) Assembly complete with RRFB; power supply; traffic signal post; foundation; pedestrian push button; warning signs and plaques; controller and cabinet; and wireless communication equipment as shown on the plans and/or as specified by the Engineer. All equipment and hardware required to mount the RRFB and associated equipment to the assembly shall be included in the unit cost of this item.

**Materials:** All components shall be manufactured and assembled as a complete system and consist of the following:

**Rectangular Rapid Flashing Beacon:** Each RRFB assembly shall satisfy the FHWA *Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons* (IA-11), dated July 16, 2008, and all subsequent FHWA Official Interpretation Letters and the 2009 edition of the Manual of Uniform Traffic Control Devices (MUTCD), including the unit size, mounting location, flash rate, and operational parameters unless modified herein by this special provision. The RRFB assembly shall be programmable to allow the County Traffic Engineer to set the duration of the flashing beacon display based on the crossing time requirements established in the MUTCD. The Contractor shall furnish and install two direction RRFB units with far side indicator light mounted to the sign structure as indicated on the plans. The RRFB shall be rated for Class I light intensity output according to the Society of Automotive Engineers (SAE) Standard J595 with a 15 year life expectancy. The minimum size of the LED beacon shall be 7 inches x 3 inches. The RRFB shall be able to be seen at least 1,000 feet in advance of the crossing during the day. During the night time hours, the RRFB shall be equipped with an automatic dimming feature. The RRFB shall have an operating temperature meeting NEMA specifications.

**Power Supply:** The installation may be either of an external power supply or solar powered power supply.

- A. External Power Supply: If used, the external power supply shall meet the following sections of the "Standard Specifications" and the LCDOT Traffic Signal Special Provisions except as modified herein:

Section 805, Electrical Service Installation-Traffic Signals  
Section 806, Grounding  
Section 810, Underground Raceways  
Section 870, Multi-Conductor Power Cable  
Section 873, Electric Cable

- B. Solar Power Supply: If used the solar power supply shall be easy to install, fully self-contained weather, corrosion, and vandal-resistant, with a UV-resistant solar panel. The solar power supply shall be power autonomous without need of an external power supply. The batteries shall be sealed, maintenance free, and field-replaceable independently of other components. The battery pack shall have a minimum rated lifespan of three years. The power supply system shall have the capacity to operate the RRFB for 30 days at a normal use of 400 activations of 30 seconds per day without solar charging. The RRFB shall have an automatic light control to provide useful light during extreme conditions that prevent charging over an extended period of time. The manufacturer shall

provide documentation for each installation consisting of solar power calculations to verify load, duty cycle and battery capacity based on location.

The solar panel shall be installed at the highest point on the assembly structure, or as directed by the Engineer, and away from the travelled way. The solar panel shall be installed at an angle specified by the manufacturer facing the equator (due south) with a full unobstructed solar exposure for optimum performance of the system, or as recommended by the manufacturer and directed by the Engineer. If batteries are to be installed in a separate cabinet, the cabinet shall be a minimum of seven feet above the ground and located on the post as to be not over the sidewalk, bike path or trail.

**Controller:** The RRFB controller shall meet the requirements of Section 858 of the "Standard Specifications" and the LCDOT Traffic Signal Special Provisions except where modified herein:

- A. Power Options: The controller unit shall be available in both solar-powered and AC powered options.
- B. Controller to Controller Communication: At each location all installed RRFB assemblies shall communicate wirelessly using an unlicensed radio band so as to simultaneously commence operation of their alternating rapid flashing indications and cease operation simultaneously. The communication equipment shall comply with FCC requirements and the vendor representative shall field test the equipment prior to placing the units in operation to demonstrate the RRFBs ability to achieve proper operation under the requirements of FHWA Memorandum IA-11 and all subsequent interpretation letters. Up to 10 optional RF channels shall be available to allow multiple RRFB Systems to operate within close proximity of each other.
- C. Timing: The controller shall provide the full programmed timing upon all push button activations.

**Traffic Signal Post:** The traffic signal post shall meet the requirements of Section 875 of the "Standard Specifications" and the LCDOT Traffic Signal Special Provisions for traffic signal post or traffic signal post, special, as shown on the plans.

**Foundation:** The traffic signal post foundation may be either concrete or metal.

- A. Concrete Foundation: If used the concrete foundation shall meet the requirements of Section 878 of the "Standard Specifications" and the LCDOT Traffic Signal Special Provisions.
- B. Light Pole Foundation Metal: If used the metal foundation shall meet the requirements of Section 836 of the "Standard Specifications".

**Pedestrian Push Button:** The pedestrian push button shall meet the requirements of Section 888 of the "Standard Specifications" and the LCDOT Traffic Signal Special Provisions.

**Signs:** Each RRFB assembly shall include two crossing signs (W11-1, W11-2, W11-15 or S1-1) 36 inch x 36 inch dimension, two diagonal downward pointing arrow (W16-7P) plaques 24 inch x 12 inch dimension, mounted back-to-back and a R10-25 9 inch x 12 inch dimension, mounted as part of or above the pedestrian push button. The W-series sign panels shall be manufactured with fluorescent yellow green type ZZ sheeting meeting the requirements of Section 1091 of the "Standard Specifications". The R-series signs shall be manufactured with type AP sheeting meeting the requirements of Section 1091 of the "Standard Specifications" and shall be vandal resistant. All signs shall meet the latest requirements of the MUTCD. The signs shall have brackets and sign channels which are equal to and completely interchangeable with those used by the LCDOT Sign Shop. The Signfix Aluminum Channel Framing System is currently recommended, but other brands of mounting hardware are acceptable based upon the County's approval.

**Warranty:** All materials shall be warranted for three years from date of acceptance or turn on by the LCDOT Traffic Department.

**Installation:** The RRFB Assembly (Complete) shall be installed strictly according to the manufacturer's recommendations, the applicable portions of the "Standard Specifications" and the LCDOT Traffic Signal Special Provision as modified herein, as shown on the Plans, and/or as directed by the Engineer.

The final elevation and location of the beacons shall be approved by the Engineer prior to the Contractor beginning work.

**Basis of Payment:** This work will be paid at the contract unit price for each SOLAR-POWERED FLASHING BEACON ASSEMBLY (COMPLETE). The unit price shall include all labor, equipment, materials and documentation required to furnish and install the RRFB assembly complete with power supply; traffic signal post; foundation; pedestrian push button; warning signs and plaques; controller and cabinet; wireless communication equipment; and mounting hardware.

**X0327008 REMOVE AND RELOCATE SIGN (SPECIAL)**

**Description:** This work shall consist of removal and relocation of the existing Washington Street Station sign at the northeast corner of Washington Street and Lowlands Drive. The sign will first be removed and relocated to an interim location and will later be removed and relocated to its final location as specified in the plans.

**General:** The sign posts and foundations shall be removed and replaced, including adjustment to final grade. Any damage to the existing materials, including the foundation, post, and sign shall be repaired or reconstructed to the satisfaction of the engineer.

**Method of Measurement:** Removal and relocation of the sign shall be measured per each.

**Basis of Payment:** This work will be paid for at the contract unit price per each for REMOVE AND RELOCATE SIGN (SPECIAL). *The unit price shall include all excavation as required, furnishing a new foundation as necessary, repair for any damage incurred during the contractor's work, and replacement of the sign with adjustments to final location and grade to the satisfaction of the engineer.*

**X0327036 BIKE PATH REMOVAL**

**Description:** This work shall include complete removal and disposal of existing hot-mix asphalt bike paths to the limits shown on the plans or as determined by the Engineer, including the approximately 2 inches of hot-mix asphalt surface and approximately 8 inches of aggregate base course.

**Method of Measurement:** Bike path removal will be measured for payment in place and the area computed in square yards. No adjustments will be made for variations in assumed thickness.

**Basis of Payment:** This work will be paid for at the contract unit price per square yard for BIKE PATH REMOVAL.

**X0327147 REMOVE RAILROAD PLATFORM**

Description. This work shall consist of the complete demolition and removal of the temporary Grayslake Metra Station platform, including but not limited to ADA tactile surface, bituminous asphalt surface, treated timber, hardware, and earthwork needed to restore area back to original condition. The work shall be done as such to avoid impacting the daily commuter operations of the Station. Any additional materials left on site after Metra Forces have completed salvage of selected materials shall be taken off site and disposed of properly at no additional cost to the project.

Basis of Payment. This work will be paid for at the contract unit price per SQUARE FOOT (SF) for REMOVE RAILROAD PLATFORM, regardless of size and material.



### **X0327357 CONSTRUCTION VIBRATION MONITORING**

This work shall consist of furnishing, installing, maintaining and removing vibration-monitoring instrumentation, collecting vibration data, performing building condition survey and monitoring, interpreting and reporting the results and implementing response actions as required.

The purpose of the construction vibration-monitoring is to protect existing properties from excess vibration due to temporary earth retention system installation and pile driving operations during the bridge and retaining wall construction activities. The Contractor shall implement required remedial and precautionary measures based on their Vibration Monitoring Engineer's recommendations. At a minimum, the existing houses adjacent to the construction limits shall be monitored as required herein. In addition, prior to beginning any work, the Contractor and the Engineer shall observe the construction limits and determine if any additional houses shall be monitored for vibrations.

Construction vibration and monitoring shall include, but is not limited, to the following:

**Condition Monitoring.** For the purpose of monitoring adjacent building damage, a thorough visual inspection of the homes adjacent to the project shall be completed by an Illinois Licensed Structural Engineer prior to construction and upon completion. The inspection shall be documented with both notes and photographs and shall include a log of the locations, lengths and widths of cracks, binding of doors or windows, peeling of wall coverings, floor sags, tilt, lean or bow of vertical members and other indications of building settlement or movement.

**Vibration Monitoring.** For the purpose of monitoring vibrations caused by temporary earth retention system installation and proposed pile driving, peak particle velocities at the adjacent homes shall be monitored. A benchmark peak particle velocity monitoring shall be accomplished for a period of one week prior to the start of any construction activities. Then peak particle velocities shall be recorded everyday during construction when work is being performed for the bridge and retaining walls. When peak particle velocities exceed 0.2 in/sec., the Contractor shall notify the Engineer immediately and suspend all construction activities. The Contractor shall hire a company to perform all monitoring activities.

The Contractor's vibration-monitoring personnel shall include a qualified Vibration Monitoring Engineer who is a registered Professional Engineer in the State of Illinois and who has at least 4 years of experience in the installation and use of vibration-monitoring instrumentation and in interpreting vibration monitoring data. The Vibration Monitoring Engineer shall prepare the vibration monitoring plan and shall be on site to supervise the initial installation of each vibration-monitoring instrument(s) and supervise interpretations of vibration-monitoring data.

**Equipment.** The Contractor shall furnish, install, calibrate, maintain and operate instrumentation for measuring and recording vibrations. The recording instruments shall be a velocity seismograph. Additional instruments shall be provided as necessary to evaluate propagation of vibrations. At least one instrument shall be available. The instrument(s) shall be periodically checked for proper calibration and shall be maintained in firstclass working order. Instruments shall be replaced, repaired or re-calibrated when needed or when directed by the Engineer.

**Corrective Measures.** If at any time resulting movements are serious in nature or cause damage to facilities or property, the Contractor shall stop work immediately and the necessary corrective measures shall be initiated as directed by the Engineer. Damage as a result of the work activity

of the Contractor will be corrected by the Contractor as determined by the Engineer. No additional compensation will be due the Contractor for repairing these facilities. The Contractor will not be entitled to any claim of delay for stopping of working to make correct measures.

Submittals. Prior to the start of construction and prior to performing any vibration monitoring, the Contractor shall submit to the Engineer for review a written Vibration Control Plan detailing the procedures for condition monitoring and vibration monitoring. Such details shall include: The name of the Firm providing the vibration monitoring services; description of the instrumentation and equipment to be used, measurement locations and methods for mounting the vibration sensors, procedures for data collection and analysis and means and methods of providing warning when the critical PPV, as determined by the Vibration Monitoring Engineer, are reached.

The plan shall also state both a threshold PPV value, at which vibrations below the threshold do not need to be recorded and a critical PPV, at which a stop in work is necessary. The critical PPV should be determined for each building types monitored and be based on criteria from the Federal Transit Administration's Transit Noise and Vibration Impact Assessment Report and the United States Bureau of Mines (USBM) Vibration Criteria. The plan shall also indicate the plans of action to be implemented in the event any threshold or critical PPV are reached. The generalized plans of action shall be positive measures by the Contractor to control vibrations (e.g. using alternative construction methods).

Additional Submittals include:

- Weekly reports of all vibration monitoring

Method of Measurement. The work under this item as described herein will not be measured separately. It will be paid for as lump sum.

Basis of Payment. This work will be paid at the contract unit price per lump sum for CONSTRUCTION VIBRATION MONITORING which payment shall be full compensation for the work described herein and as directed by the Engineer.

**X0327700 STEEL SECURITY GATE, 12'**

Description. This work shall consist of furnishing and installing a 12-foot steel security gate for the CN Permanent Access Roadway as directed by the Engineer.

Basis of Payment. This work will be paid for at the contract unit price per EACH for STEEL SECURITY GATE, 12', regardless of size and material.

**X0327725 ADDITIONAL DEPTH OF MANHOLES**

Description. This work shall consist of payment for additional depth of manholes, catch basins, and sanitary manholes in excess of eight feet. Measurement is from the invert of the outlet pipe to the top of casting.

Basis of Payment. This work shall be paid for at the contract unit price per vertical foot for ADDITIONAL DEPTH OF MANHOLES.

**X0811100 RAILROAD CROSSING**

Description: This includes furnishing all labor, material, and equipment for the installation of temporary at-grade rail/highway crossings at the Temporary Roadway Runaround. There will be one temporary crossing on the permanent main track and one on the temporary shoofly track for the temporary roadway run-around.

The temporary railroad crossings will consist of a rubber crossing as shown on the plans. The temporary railroad crossings will include the installation of 10-foot cross ties within the limits of the crossing panels. The temporary crossings are 48-foot wide crossings.

Basis of Payment. This work will be paid for at the contract unit price per LUMP SUM for RAILROAD CROSSING, regardless of size and material.

**X0839900 SANITARY SEWER REMOVAL 6”**

Description. This work shall consist of the removal of existing sanitary sewers and sanitary force mains at the locations shown on the plans and as directed by the Engineer. Prior to removing any sewers or force mains, the Contractor is responsible for ensuring that the line is not in service and/or a shutdown has been coordinated with the owner of the sewer/force main. Additionally, the removal of sanitary sewer may not commence prior to all affected services having been connected to a new sewer and acceptance of that work by the owner of the sewer.

All work shall otherwise conform to the applicable articles of Section 551.

Method of Measurement. Sanitary sewer removal will be measured for payment according to Article 550.09. The length measured along force mains will include fittings and valves.

Basis of Payment. This work will be paid for at the contract unit price per foot for SANITARY SEWER REMOVAL, of the diameter specified, regardless of material; which price shall include fittings and valves.

**X2502014 SEEDING, CLASS 4A (MODIFIED)**

**Description:** This work shall consist of Seeding Class 4A (Modified) in areas as shown in the plans or as directed by the Engineer.

All work, materials, and equipment shall conform to Sections 250 and 1081 of the Standard Specifications except as modified herein.

The Class 4A (Modified) seed mixture shall be supplied in separate bags of the three mixture components: Permanent Grasses, Temporary Cover, and Forbs. All native species will be local genotype and verified that original seed collection source will be from a radius of not more than 150 miles from the project location. Fertilizer is not required.

Article 250.07 Seeding Mixtures – Delete sentence 4. Add the following to Table 1 – Seeding Mixtures:

**WASHINGTON STREET GRADE SEPARATION  
 SEED MIX 4A (MODIFIED)**

**Low-profile Prairie Seed Mix**

<u>Botanical Name</u>	<u>Common Name</u>	<u>PLS Ounces/Acre</u>	<u>Seeds/Oz</u>	<u>Seeds/SQ FT</u>
<b>Permanent Grasses:</b>				
<i>Bouteloua curtipendula</i>	Side Oats Grama	10.00	9375	2.15
<i>Carex</i> spp.	Prairie Carex Mix	4.00	33422	3.07
<i>Elymus canadensis</i>	Canada Wild Rye	32.00	4258	3.13
<i>Koeleria cristata</i>	June Grass	1.00	150000	3.44
<i>Panicum virgatum</i>	Switch Grass	1.00	28356	0.65
<i>Schizachyrium scoparium</i>	Little Bluestem	32.00	8800	6.46
	<b>Total</b>	<b>80.00</b>		<b>18.91</b>
<b>Temporary Cover:</b>				
<i>Avena sativa</i>	Common Oat	360.00	8125	67.15
<i>Lolium multiflorum</i>	Annual Rye	100.00	14188	32.57
	<b>Total</b>	<b>460.00</b>		<b>99.72</b>
<b>Forbs:</b>				
<i>Anemone cylindrica</i>	Thimbleweed	0.50	20938	0.24
<i>Asclepias tuberosa</i>	Butterfly Milkweed	2.00	3500	0.16
<i>Aster ericoideus</i>	Heath Aster	0.25	140000	0.80
<i>Aster laevis</i>	Smooth Blue Aster	0.75	48000	0.83
<i>Aster novae-angliae</i>	New England Aster	0.25	78000	0.44
<i>Baptisia lactea</i>	White Wild Indigo	2.00	1600	0.07
<i>Chamaecrista fasciculata</i>	Partridge Pea	14.00	3600	1.22
<i>Coreopsis lanceolata</i>	Sand Coreopsis	5.00	12500	1.43
<i>Coreopsis palmata</i>	Prairie Coreopsis	1.00	11500	0.26
<i>Dalea candida</i>	White Prairie Clover	1.50	26250	0.90
<i>Dalea purpurea</i>	Purple Prairie Clover	1.50	20000	0.69
<i>Echinacea purpurea</i>	Broad-Leaved Purple Coneflower	7.00	6500	1.06
<i>Eryngium yuccifolium</i>	Rattlesnake Master	2.50	8000	0.46
<i>Lespedeza capitata</i>	Round-Head Bush Clover	2.00	10000	0.46
<i>Liatris aspera</i>	Rough Blazing Star	0.50	13000	0.15
<i>Lupinus perennis</i>	Wild Lupine	2.00	1000	0.05
<i>Monarda fistulosa</i>	Wild Bergamot	0.75	78000	1.34
<i>Parthenium integrifolium</i>	Wild Quinine	1.00	6800	0.16
<i>Penstemon digitalis</i>	Foxglove Beard Tongue	0.50	115000	1.32
<i>Pycnanthemum virginianum</i>	Common Mountain Mint	1.00	331250	7.60
<i>Ratibida pinnata</i>	Yellow Coneflower	4.00	25250	2.32
<i>Rudbeckia hirta</i>	Black-Eyed Susan	5.00	110000	12.63
<i>Rudbeckia subtomentosa</i>	Sweet Black-Eyed Susan	1.00	46000	1.06
<i>Silphium integrifolium</i>	Rosin Weed	3.00	4000	0.28
<i>Silphium terebinthinaceum</i>	Prairie Dook	0.50	1100	0.01
<i>Solidago nemoralis</i>	Old-Field Goldenrod	0.50	240000	2.75
<i>Solidago rigida</i>	Stiff Goldenrod	1.00	48000	1.06
<i>Tradescantia ohioensis</i>	Common Spiderwort	0.75	8000	0.14
<i>Vernonia</i> spp.	Ironweed (Various Mix)	1.75	24000	0.96
<i>Veronicastrum virginianum</i>	Culvers Root	0.25	750000	4.30
	<b>Total</b>	<b>63.75</b>		<b>45.16</b>

<b>Mix Statistics</b>				
<u>Native Component</u>	<u>PLS lbs./Acre</u>	<u>PLS Seeds/Acre</u>	<u>PLS Seeds/Sq. Ft.</u>	<u>% of Native Mix</u>
Forbs	3.95	1,667,044	45.16	70.46%
Grasses	5.00	823,650	18.91	29.51%
Total Natives	8.95	2,760,694	64.07	100.00%
Cover	28.75	4,343,800	99.72	
Totals	37.73	7,134,494	163.79	



Notes:

1. The seeding time for this work shall be November 1 to May 15. Seeding done outside of this time frame will not be measured for payment.
2. Each bag shall be labeled. The label shall bear the dealer's guarantee of mixture and year grown, purity and germination, and date of test. Purity and germination tests no older than six months of the date of sowing must be submitted to verify all bulk seed required to achieve LB PLS specified.
3. No seed shall be sown until the purity testing has been completed for seeds to be used and shows the seed meets the noxious weed requirements.
4. Seed, which has become wet, moldy, or otherwise damaged, will not be acceptable. Prior to application, the Engineer must approve seed mix in the bags.

**Basis of Payment:** This work will be paid for at the contract unit price per acre (hectare) for SEEDING or INTERSEEDING of the Class specified.

Mowing will be paid for at the contract unit price per acre (hectare) for MOWING. Only the initial mowing will be paid for. Any subsequent mowing required to obtain a height of not more than 3 in. (75 mm) or to disperse mowed material will be considered as included in the cost of the initial mowing.

Selective Mowing Stakes will be paid for at the contract unit price per each for SELECTIVE MOWING STAKES.

**X2511630 EROSION CONTROL BLANKET (SPECIAL)**

**Description:** This work shall consist of furnishing, placing and removing erosion control mat in ditch bottoms along with a flocculation powder application as a temporary erosion control measure before final stabilization with erosion control blanket and seeding.

**Materials:** The erosion control mat shall be limited to jute fabric according to the following:

The erosion control mat shall be a woven fabric of a uniform open weave of single jute yarn. The jute yarn shall be of loosely twisted construction with an average twist of not less than 1½ turns per 1". The average size of the warp and weft yarns shall be approximately the same. The woven fabric shall be supplied in rolled strips with a certificate of compliance certifying that the jute fabric erosion mat conforms to the following:

- *That the erosion control mat is a minimum 48" wide with a tolerance of minus 1".*
- *That the erosion control mat has 78 warp ends, +/- 1 for each 48" of width.*
- *That the erosion control mat has 45 weft yarns, +/- 2, per linear yard of length.*
- *That the erosion control mat weighs 92 pounds per 100 square yards +/- 10 percent, measured under average atmospheric conditions.*
- *That the erosion control mat is non-toxic to vegetation.*

**General:** The work shall be performed according to Article 251.04 of the "Standard Specifications" and the manufacturer's recommendations.

**Method of Measurement:** This work will be measured for payment per square yard of material placed. *Each installation of the erosion control mat shall be measured for payment. The flocculation powder will be measured separately according to the special provision for FLOCCULATION POWDER contained herein.*

**Basis of Payment:** This work will be paid for at the contract unit price per square yard for EROSION CONTROL BLANKET (SPECIAL). *The unit price shall include all labor, equipment and materials necessary for installation, removal and disposal of the erosion control mat. The flocculation powder will be paid for separately according to the special provision for FLOCCULATION POWDER contained herein.*

**X4060995 TEMPORARY RAMP, SPECIAL**

**Description:** This work shall consist of constructing and maintaining a section of temporary pavement and subgrade during Stage 2B of the "Suggested Stages of Construction" between Stations 21+30.45 and 24+39.09 of the temporary roadway run-around in order to meet the proposed elevation of the permanent railroad track.

**General:** The material used for the temporary ramp shall match the material used for the pay item "Temporary Pavement", with a thickness of 8" as per the contract plans. In addition, a varying thickness of subgrade will be required between the existing elevation of the roadway run-around during Stage 2 and the proposed elevation during Stage 2B. All material placed under the 8" pavement thickness shall meet the requirements of Section 205 Embankment I.

The construction of the "Temporary Ramp, Special" must take place during a short-term closure of the roadway run-around at the approval of the Engineer, and must be coordinated with the Wisconsin Central Limited Railroad, Metra, and any contractors working on adjacent construction projects.

**Method of Measurement:** This work will be measured for payment in place and the area computed in square yards. The width of measurement shall be as shown on the plans or as directed by the Engineer.

**Basis of Payment:** This work will be paid for at the contract unit price per square yard for TEMPORARY RAMP, SPECIAL, which shall constitute full payment for constructing and maintaining the temporary pavement and subgrade.

Removal of TEMPORARY RAMP, SPECIAL will be paid for at the contract unit price per square yard for PAVEMENT REMOVAL.

**X5030225 CONCRETE STRUCTURES (SPECIAL)**

Description. This work shall consist of constructing cast-in-place concrete structures for the bridge abutments and wingwalls. The work shall be in accordance with Standard Specification Section 503 and American Railway Engineering and Maintenance of Way Association (AREMA) "Manual for Railway Engineering", Chapter 8, Concrete Structures except as modified herein, as shown on the drawings and as directed by the Engineer.

Materials. The materials shall be in accordance with to the following:

- (a) All concrete covered in this specification shall achieve a minimum compressive strength of 5,000 PSI at 28 days.
- (b) The Railway will not approve the use of slag, fly ash or a combination of the two in any work.
- (c) Cement.
  1. The cement used in the concrete for all grade separations shall be low alkali cement. The Contractor shall obtain and furnish to the Engineer, a statement signed by an officer or chemist of the cement manufacturer, certifying that the cement furnished does not exceed 0.6 percent alkali equivalent, as measured by the percent of sodium oxide plus 0.658 times the percent of potassium oxide.
  2. If the above cement type is proven to be unavailable, alternative cement proposed must be tested for alkali aggregate reactivity utilizing mortar bar accelerated expansion test or other acceptable tests. The concrete to be tested shall be based on the proposed design concrete mix and source of aggregates, which is project specific. The Senior Engineer must approve the acceptance of the cement.

Sampling. The Contractor shall engage and pay the costs associated with engaging an independent testing laboratory to execute the following concrete tests:

- a. A minimum of four (4) cylinders be made for each 50 cubic yards or portion thereof for each class of concrete for each day are required, two (2) for checking strength at 14 day compressive strength and two (2) for 28 day compressive strength testing.
- b. The air content of freshly mixed air-entrained concrete shall be checked at least twice for each 50 cubic yards or portion thereof for each class of concrete for each day.
- c. A minimum of two (2) determinations for slump shall be made for each 50 cubic yards or portion thereof for each class of concrete for each day.

Depositing concrete. Chutes, pipelines or baffles made of aluminum or aluminum alloy components shall not be used.

Curing. All concrete shall be cured as follows:

- (a) Concrete shall be protected from freezing, abnormally high temperatures, premature drying and moisture loss.
- (b) All concrete surfaces shall be moist cured for a minimum of seven (7) consecutive days at a minimum of 50 deg. F (10 deg. C) or for the time necessary to attain 70% of the specified 28 day compressive strength.
- (c) The use of curing compounds will not be permitted unless approved by the Senior Engineer.

Measurement of Payment. This work shall be measured in cubic yards according to the requirements specified in Section 503.21 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per cubic yard for CONCRETE STRUCTURES (SPECIAL).

**X5030290 STAINING CONCRETE STRUCTURES**

**Description:** This work shall consist of staining permanently exposed surfaces of designated concrete structures. Staining concrete structures shall be applied to the following exposed concrete surfaces:

1. Retaining Wall Stone Pattern Formliner
2. Retaining Wall Panel Insert Formliner

The stain for all formliner areas shall match the color indicated below and as applied to concrete structures as indicated in the Contract Documents:

Specified color: "Beech CH" or equal as defined by Bomanite Coloration Systems.  
[www.bomanite.com](http://www.bomanite.com)

**Materials:** The stain shall create a surface finish that is breathable (allowing water vapor transmission), and that resists deterioration from water, acid, alkali, fungi, sunlight and/or weathering. The stain shall be odor free and V.O.C. compliant. The stain shall meet the requirements for weathering resistance of 2000 hours accelerated exposure.

**Qualifications of Stain Applicator:** The concrete stain applicator shall have a minimum of five (5) years demonstrated experience in concrete stain applications. The installer shall submit evidence of appropriate experience, job listings and project photographs from previous work.

**Sample Panel:** Upon receipt of notification of the style of form liner to be used, the Contractor shall submit a proposed procedure for obtaining the simulated finish using the approved architectural form liner style and stain - see the special provision for FORM LINER TEXTURED SURFACE. The procedure shall include plans and details for the form liner pattern and dimensions, and be submitted for the Engineer's approval no later than 30 calendar days following the date of notification of approval of the form liner style type. If such plans and details are not satisfactory to the Engineer and LCDOT, the Contractor shall make any changes as may be required by the Engineer or LCDOT at no additional cost to the Department.

Upon approval of the form liner plans and details, the Contractor shall submit a 3' by 3' (minimum) sample concrete panel of the simulated finish to include staining. The sample panel shall be delivered and positioned on the job site at a location to be determined by the Engineer. The following sample panels shall be provided:

1. Retaining Wall Stone Pattern Formliner
2. Retaining Wall Panel Insert Formliner

**General:** The surfaces to be stained shall be structurally sound, clean, dry, and fully cured. The concrete shall be at least 30 days old prior to applying the stain. Curing agents shall be removed a minimum of 14 days prior to staining to allow the concrete to dry out.

Temperature and relative humidity conditions shall meet the manufacturer's application instructions. Do not apply the stain under rainy conditions or within three days after surfaces become wet from rainfall or other moisture. Do not apply when the weather is foggy or overcast.

The concrete surface shall be cleaned prior to the applying the stain materials. The methods and materials used for cleaning the substrate shall be as recommended by the manufacturer of the stain. The Contractor shall ensure that the surface is free of latency, dirt, dust, grease, efflorescence, paint, or other foreign material. The Contractor shall not use sandblasting as a cleaning method. The preferred method to remove latency is pressure washing with water, at a minimum 3000 psi (3-4 gal/min), using fan nozzle. The nozzle should be positioned perpendicular to and at a distance of 1-2 feet from the concrete surface. The cleaned surface shall be free of blemishes, discoloration, surface voids and unnatural form marks.

The stain shall be thoroughly mixed according to the manufacturer's directions using an air-driven or other explosion-proof power mixer. Mix all containers thoroughly prior to application. Do not thin the material. Materials shall be applied at the rate as recommended by the manufacturer. Absorption rates may be increased or decreased depending upon the surface texture and porosity of the substrate so as to achieve even staining.

A test area of ten square feet shall be prepared and the stain applied to the surface to verify the surface preparation, adhesion and color. Once the Engineer has approved the results from the test area the application of the stain to the rest of the exposed surfaces may be completed.

Take precautions to ensure that workers and work areas are adequately protected from fire and health hazards resulting from handling, mixing and application of materials. Furnish all the necessary equipment to complete the work. Provide drop cloths and other forms of protection necessary to protect all adjoining work and surfaces to render them completely free of overspray and splash from the concrete stain work. Any surfaces, which have been damaged or splattered, shall be cleaned, restored, or replaced to the satisfaction of the Engineer.

Avoid staining the "mortar joints" by providing suitable protection over the joints during the staining process.

Schedule the color stain application with earthwork and back-filling of any wall areas making sure that all simulated stone texture that might fall below grade is colored prior to back-filling. Delay adjacent plantings until color application is completed. Coordinate work to permit coloring applications without interference from other trades. Where exposed soil or pavement is adjacent which may spatter dirt or soil from rainfall, or where surface may be subject to overspray from other processes, provide temporary cover of completed work.

**Method of Measurement:** The exposed surfaces stained, will be measured in place and the area computed in square feet.

**Basis of Payment:** This work will be paid for at the contract unit price per square feet for STAINING CONCRETE STRUCTURES. The unit price shall include all equipment, materials and labor required to stain the exposed concrete surfaces.

**X5051900 STEEL GRATE WALKWAY**

Description. This work shall consist of furnishing and installing the Steel Grate Walkway as shown on the plans and as directed by the Engineering including, but not limited to purchase, preparation and fabrication of grating and all associated materials, shipping and handling. The following requirements are in addition to the requirements specified in Standard Specifications Section 505.

Materials. The Steel Grate Walkway shall comply with standard specifications for Metal Bar Grating published in ANSI/NAAMM A202.1 "Metal Bar Grating Manual". Welded and fabricated steel grating shall have bearing bars 1-1/2 inch x 3/16 inch, minimum spaced 1-3/16 inches on center and cross bars 1/4 x 1/4 inches, minimum, spaced 4" on center. Traffic surface for the steel bar grating shall be serrated. The fabricated steel grating shall be hot-dipped galvanized in accordance with ASTM A-123. Installation of grating shall comply with recommendations of NAAMM grating standard referenced under Part 2 that apply to grating types and bar sizes indicated, including installation clearances and standard anchoring details.

Length of panels shall not exceed 20 feet. Grating panels shall be fully banded.

Gratings shall be fabricated and installed in such a manner that the cross bars in each grating runs continuously in the same direction.

Method of Measurement. Steel Grate Walkway shall be measured for payment per square yard.

Basis of Payment. Steel Grate Walkway will be paid for at the contract unit price per square yard for STEEL GRATE WALKWAY.



**X5429311 TRAVERSABLE PIPE GRADE, SPECIAL**

Description. This work shall consist of furnishing and installing grates on precast concrete flared end sections.

General: The work shall be performed according to Article 542.07 of the "Standard Specifications" and the following:

Grates for round and elliptical pipe, precast flared end sections, pipe sizes 24" thru 54", shall meet the requirements of IDOT standard 542311, Revision 213.

Grates for pipes larger than 54" and/or other shapes shall be fabricated and installed as shown on the plans.

Basis of Payment. This work will be paid for at the contract unit price per FOOT for TRAVERSABLE PIPE GRATE, SPECIAL. The unit price shall include all equipment, materials and labor required to furnish and install the grate on the precast concrete flared end section.

**X6020090 MANHOLES, WITH RESTRICTOR PLATE**

Description. This work shall consist of constructing manholes with restrictors, together with the necessary cast iron frames and grates or lids.

Construction requirements. This work shall be completed in accordance with applicable portions of Section 602 of the Standard Specifications and the details in the plans.

Manhole structures shall be Type A per IDOT Standards 602401, 602406, 602411, or 602416, "*Manhole, Type A, for the specified diameter*" modified as depicted on the plans. The restrictor plate should have a sharp-edged opening, centered horizontally, of the diameter and at the elevation shown on the plans.

The steel restrictor plate shall be placed between pairs of 3"x3"x3/8" steel angles placed along the bottom and both vertical edges of the restrictor plate. Vertical steel angles should extend the full length from the bottom to the top of the restrictor plate. Horizontal steel angles should extend from vertical angle to vertical angle. All steel angles and the restrictor plate shall be galvanized after fabrication.

Each section of steel angle shall be fastened to the manhole wall and base using 3/8" stainless steel studs with nuts and expansion anchors. Fasteners shall be uniformly spaced along each angle with a 6" space from each end. A minimum of 3 fasteners shall be used on each horizontal angle and a minimum of 6 fasteners shall be used on each vertical angle.

Riser pipe materials shall be as specified on the plans.

Basis of Payment. This work will be paid for at the Contract unit price per each for MANHOLES, WITH RESTRICTOR PLATE, regardless of size, as specified on the plans.

**X6300215 RAIL ELEMENT PLATES**

Description: Furnishing and Installing Rail Element Plates will consist of the installation of the inside steel guard rail in the track structure over the new bridge. This includes furnishing all labor, material, and equipment for the installation of two additional rails inside the two running rails in the track structure to protect the bridge structure. The two additional rails can be new or relay 136 lb. jointed rail and spiked directly to the ties without tie plates in accordance with CN Track Standard Plan TS 1108.

Method of Measurement and Basis of Payment: Payment for RAIL ELEMENT PLATES (Inside Steel Guard Rail) shall be EACH. The Each unit of payment shall be for a total of 120 track feet (TF) and will include the inside steel guard rails on both sides.

**X6640200 TEMPORARY CHAIN LINK FENCE**

Description. This work shall consist of the furnishing and installing a 4-foot temporary chain link fence along the edge of the existing platform at the Grayslake Metra Station. This pay item also includes the removal of the temporary fence at the end of the temporary platform staging.

Basis of Payment. This work will be paid for at the contract unit price per FOOT for TEMPORARY CHAIN LINK FENCE, regardless of size and material.

**X7800455 POLYUREA PAVEMENT MARKING TYPE I RAISED MEDIAN**

**General:** Work shall consist of painting the curb and median nose solid for 10' or radius of nose, whichever is greater. Median paint shall be per Article 780.10 of the Standard Specifications and as shown on the plans or as directed by the Engineer.

**Basis of Payment:** This work will be paid for at the contract unit price per square foot for POLYUREA PAVEMENT MARKING TYPE I RAISED MEDIAN. *The unit price shall include all costs for cleaning and cleaning the application area. The unit price shall also include all equipment, materials and labor required to paint the ramped median noses.*

**X8410105 TEMPORARY LIGHTING SYSTEM**

Description. This work shall consist of furnishing all materials for the Temporary Light Units to be installed along the Temporary Platform at the Grayslake Metra Station. The contractor shall provide all materials, including but not limited to poles, fixtures, wiring, assembly and all appurtenances, needed for the installation of the light unit. The contractor shall erect all poles in preparation for Metra Forces. Metra Forces shall install and wire all lighting fixtures and units. All work shall otherwise conform to the applicable articles of Section 821 & 830.

Basis of Payment. This work will be paid for at the contract unit price per EACH for TEMPORARY LIGHTING SYSTEM, regardless of size and material.

**X8570215 FULL ACTUATED CONTROLLER IN EXISTING CABINET**

**Description:** This work shall consist of furnishing a full actuated controller in an existing Type IV cabinet and shall meet the requirements in the LCDOT Traffic Signal Special Provisions

**Materials:** The Controller shall be the latest model available that is fully compatible with software currently in use by the County.

**Basis of Payment:** This work shall be paid for at the contract unit price per each for FULL-ACTUATED CONTROLLER IN EXISTING CABINET.

**XX000366 CLAY LINER**

Description. Project stormwater storage basin shall be excavated and graded to provide facilities in conformance with the Plans and Specifications. Basins shall be over-excavated and impervious clay liner shall be installed where required by the Geotechnical Engineer to seal exposed areas of granular material. Clay liner shall have a minimum thickness of 18 inches and be covered by at least 12 inches of topsoil.

The liner shall be constructed out of clayey soil classified as CL or CH according to the Unified Classification System. Soils used to construct the liner should have at least 20% fines (fine silt and clay-sized particles). The Plasticity Index (PI) should be greater than 10 and less than 30. The soil should not contain more than 10% gravel-sized particles. The low permeability layer shall have a hydraulic conductivity of  $1 \times 10^{-6}$  cm/sec or less.

The clay liner material shall be placed in lifts no greater than 8 inches thick (loose measure) and compacted with a sheepsfoot roller. Each soil layer shall be uniformly placed. All rocks greater than 2 inches, large roots, or other objectionable items shall be removed prior to compaction. Lifts shall be compacted to at least 92% of the maximum dry density at a moisture content ranging from the optimum moisture content (OMC) to six percentage points above OMC as determined by the standard Proctor (ASTM D 698).

Basis of Payment. This work will be paid for at the contract unit price per cubic foot for CLAY LINER.



**XX006277 TEMPORARY SEDIMENT TRAP**

Description. This work shall be performed in accordance with Section 280 of the Standard Specifications except where modified by this special provision. This work shall include the construction of a temporary sediment trap conforming to the Temporary Sediment Trap detail in the plans.

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

## **XX007881 DOCUMENTATION CAMERAS**

Description. This work shall consist of furnishing, installing and maintaining a documentation camera system including two (2) all-weather wide angle cameras and appurtenances to document and record the construction of the Washington Street Grade Separation. The photos will be archived and shall be viewable and downloadable via a password protected website. This work also includes removal at the end of the construction.

The term "System" in this special provision refers to the cameras, supports, mounting poles, wiring, power supply, data storage devices, software, maintenance, permits and other components required to initially construct the System, and to keep it operational throughout the Term of Use as defined below.

Materials. All materials and equipment shall be in conformance with Standard Specifications Components of the System not covered herein shall be as approved by the Engineer.

### **CONSTRUCTION REQUIREMENTS**

General. The general features of the System shall be as follows.

- (a) Term of Use. Designed for 24 hour, 7 days a week operation in all weather conditions for the duration of the construction.
- (b) Physical Security. Components of the System within reach of passersby shall be hardened and tamperproof. The Engineer may require additional security measures at any time during the duration of the construction.
- (c) Power Source. Shall be compatible with the System, and capable of powering the System throughout the Term of Use specified above. The Contractor shall provide plans sealed by a professional electrical engineer showing the means and method of providing power for the System.
- (d) Camera. The cameras shall be capable of producing digital high-quality color images in all light and weather. Characteristics of the cameras used shall include as a minimum:
  - a. Weather resistant housing
  - b. Lockable camera casing
  - c. Thermostatically controlled heater, defroster and blower
  - d. Impact resistant viewing window
  - e. Adjustable camera mount
  - f. Window wiper
  - g. 1/2.5 CCD Imager
  - h. 6.0 Megapixel Imager
  - i. F-Stop of F/2.7 - F/3.5
  - j. Maximum resolution of 2816 x 2112 pixels
  - k. Wide angle adapter of .75x
  - l. Motorized zoom lens with wide angle adapter 4.5mm - 54mm
  - m. Zoom 12x optical, 4x digital
  - n. Auto ISO
  - o. Auto shutter

- p. Auto white balance
  - q. Auto focus
  - r. IP addressing dynamic or static
  - s. Operational temperature range -10 degrees F to 120 degrees F
  - t. image stabilizer
- (e) Data Storage. The System shall record digital photos every 15 minutes and archive the photos for remote viewing via a password-protected website throughout the duration of the construction. The digital photos shall be tagged with date and time and shall be saved in a manner which will allow easy retrieval and sequencing. The photo files on the website shall be full resolution and shall be available for download to users of the website at any time during construction. The data storage system shall record the photos at full resolution. Photos taken by each camera shall be stored separately. Photos from each camera shall be stored on two (2) sets each of DVD's or similar file storage mechanism and provided to Lake County Division of Transportation at the time of removal.
- (f) Data Backup. The System shall store the photos in a primary location continuously and backup the photos in a separate location, and by a method, approved by the Engineer
- (g) Time Lapse Video. The System shall be capable of creating a time lapse video of the complete construction, or any portion thereof, at the end of the project construction or at any time during the project construction. Provide two (2) time lapse videos at any point during the construction at the request of the Engineer, within 30 days of the request, and 1 final time lapse video within 30 days of the completion of construction. Each time lapse video submission shall include five (5) copies on DVD.
- (h) Ownership. The photos taken by the System shall be the sole property of Lake County Division of Transportation.

Installation. Installation of System shall be as approved by the Engineer. Submit plans and manufacturer documentation to the Engineer for approval within 30 days of Notice To Proceed. System shall not be ordered prior to obtaining the Engineer's approval. System shall be installed as soon as practicable after approval by the Engineer. Plans shall address all components of the System.

- (a) Camera Supports. Cameras are planned to be located on each side of the proposed Grade Separation and directed at the Washington Street bridge construction. Location and elevation shall be as specified by the Engineer. Supports shall be designed so that vibration will not affect photo quality. Supports shall be designed by a Structural Engineer licensed in the State of Illinois.
- (b) Camera Angle and Direction. Cameras shall be positioned on their supports to provide the vantage required by the Engineer
- (c) Conflicts. All components of the system shall be located so as to not interfere with construction operations. System components shall be located where they will not need to be relocated for the duration of the construction.
- (d) Data Storage. Install per approved plans.

- (e) Data Access. Password and level of security shall be as specified by the Engineer. A copy of the software and manuals used to create and edit the photos and video shall be provided to Lake County Division of Transportation.
- (f) Testing and Approval. Once installed, the entire System shall be tested for a minimum of 24 hours. Also, provide a DVD to the Engineer within the first 2 weeks of operation containing 5 days of photos from both cameras, and a time lapse video corresponding to these photos, to confirm that the system will produce acceptable results. Make modifications to the System as specified by the Engineer.

Maintenance. Maintain all equipment and provide for a seamless operation of the system. Allow no device to remain inoperable for a period longer than 48 hours.

Removal. Removal of System shall be performed after construction is complete, and at the discretion of the Engineer.

Basis of Payment. This work will be paid for at the contract unit lump sum price for DOCUMENTATION CAMERAS. Cost includes all labor, equipment and materials required to furnish, install, maintain and remove the cameras, software, supports, mounting poles, power source, storage devices, backup, cable, permits, power for all components, and all other appurtenances and permits required for the operation of the system for duration of construction.

**XX008392 OUTDOOR RATED NETWORK CABLE**

This work shall consist of furnishing and installing the Outdoor Rated Network Cable as described in the BLUETOOTH DETECTOR item.

Basis of Payment: This work shall be paid for at the contract unit price per foot for OUTDOOR RATED NETWORK CABLE which shall include all necessary hardware and accessories, necessary to install.

**XX008436 VALVE VAULTS, 5'-DIAMETER**

Description. This work consists of providing and installing valve vaults complete with frame and lid in accordance with the Valve Vault Detail in the Plans where indicated on the Plans or specified by the Engineer. This work shall otherwise conform to Section 602 of the Standard Specifications.

Basis of Payment. The work shall be paid for at the contract unit price per EACH for VALVE VAULTS, 5'-DIAMETER.

**XX008565 EVP CONFIRMATION BEACON, LED RETROFIT**

**Description:** This work shall consist of retrofitting an existing confirmation beacon with an LED light at the locations indicated on the plans.

**Basis of Payment:** This work will be paid for at the contract unit price per EACH for EVP CONFIRMATION BEACON, LED RETROFIT

**XX008811 GATE, SPECIAL**

Description. This work shall consist of furnishing, installing and removal of temporary security gates for the Temporary Gravel CN Access Roadway during construction staging. The temporary gates will be placed at the locations shown on the plans and as directed by the Engineer. The temporary gates will be removed at no extra cost to the project once the staging of traffic is complete.

Basis of Payment. This work will be paid for at the contract unit price per EACH for GATE, SPECIAL, regardless of size and material.



**XX008935 BLUETOOTH DETECTOR**

This work shall consist of furnishing and installing a complete, permanent Bluetooth Detector system, connected by Ethernet to the Layer II Switch, operating in Power over Ethernet (PoE) configuration. The Bluetooth Detector must be compatible with the Lake County PASSAGE central traffic signal management system. The Bluetooth Detector shall be BlueTOAD Roadside Bluetooth Sensor Equipment. The equipment shall be mounted at the location shown in the plans and shall be in accordance with the manufacturer's recommendations or as directed by the engineer. The minimum allowable mounting height shall be 10 feet above the finished grade.

The Bluetooth Detector shall be installed in a NEMA 4 type enclosure with weatherproof openings for installation of the Bluetooth Antenna and the Outdoor-Rated Network Cable.

The Bluetooth Detector shall collect data, store, and transmit data for the purpose of calculating travel times dynamically. The Bluetooth Detector must include algorithms to process the data and generate travel times in a consistent format and capable of integration with the existing TrafficCast system currently used by Lake County to provide travel times through the PASSAGE network.

Basis of Payment: This work shall be paid for at the contract unit price each for BLUETOOTH DETECTOR which shall include all necessary hardware, firmware, software, and accessories, necessary to achieve proper operation. The required mounting hardware, labor, and incidentals necessary to securely fasten the assembly to an existing pole shall be included in the cost of BLUETOOTH DETECTOR. The Ethernet cable required to provide PoE and data connectivity shall be paid for separately as OUTDOOR RATED NETWORK CABLE.

**Z0002400 BALLAST**

Description: Ballast shall include the ballast material required for the Raise and Surface Track for the raise of the existing CN main track. The ballast required for constructing the temporary shoofly track and the portion of the main track over the new bridge will be included in the item "Construct Track Complete".

The Ballast shall be crushed granite, per CN specifications (limestone, dolomite or slag will not be allowed), subject to approval by CN. Ballast shall conform to Section 2.10.4 of the AREMA Manual. AREMA size No. 5 shall be used.

Payment: Payment for Ballast shall be per Ton.

### **Z0013797 STABILIZED CONSTRUCTION ENTRANCE**

**Description:** This work shall consist of constructing a stabilized construction entrance, including furnishing, installing, maintaining and removing a stabilized pad of aggregate underlain with filter fabric, as shown on the plans or directed by the Engineer.

**Materials:** The materials used shall meet the requirements of the following:

*Aggregate: The aggregate shall be limited to IDOT Coarse Aggregate Gradations CA-1.*

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

**Construction Requirements:** *The aggregate shall be at least six inches thick. The aggregate shall not be placed until the entrance area has been inspected and approved by the Engineer.*

*The aggregate shall be dumped and spread into place in approximately horizontal layers. The layer(s) shall not exceed three feet in thickness. The aggregate shall be placed in such a manner as to produce a reasonably homogeneous stable fill that contains no segregated pockets of larger or smaller fragments or large unfilled space caused by bridging of larger fragments. No compaction shall be required beyond that resulting from the placing and spreading operations.*

*The construction entrance shall have a minimum width of 14 feet and a minimum length of 50 feet.*

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

*The entrance shall remain in place and be maintained until the disturbed area is stabilized. Any sediment spilled onto public right-of-way(s) shall be removed immediately. All removed materials shall be disposed of outside the limits of the right-of-way according to Article 202.03 of the "Standard Specifications" and/or as directed by the Engineer.*

**Method of Measurement:** The Stabilized Construction Entrance will be measured in place and the area computed in square yards.

**Basis of Payment:** The work will be paid for at the contract unit price per square yard for STABILIZED CONSTRUCTION ENTRANCE. *The unit price shall include all material, labor, equipment and any other items required to complete the construction entrance.*

**Z0018500 DRAINAGE STRUCTURES TO BE CLEANED**

**Description:** This work shall consist of cleaning out an existing drainage structure, and re-mortaring the pipe joints.

**General:** All debris shall be removed from the structure. If the structure has a sump, it shall be completely cleaned out. All debris and material removed from the drainage structure shall be disposed of, outside the right-of-way, according to Article 202.03 of the "Standard Specifications".

Any loose mortar shall be removed from the pipe inlet joints. New mortar shall be applied as required.

When the curb and gutter adjacent to the structure is scheduled for removal and replacement it will be possible to remove the frame and grate to gain access to the inside of the structure. In the event the curb and gutter adjacent to the structure is not scheduled for removal the structure shall be accessed by removing the grate only.

The Contractor shall identify any structures that cannot be accessed to perform the work. They may be dropped from the contract with the Engineer's concurrence.

**Method of Measurement:** Drainage Structure to be Cleaned & Grouted will be counted as one each, regardless of the structure size, type, and the number of pipes in the structure. The total will be as shown on the plans [quantity schedules] less any structures dropped from the contract with the Engineer's concurrence.

**Basis of Payment:** This work will be paid for at the contract unit price per each for DRAINAGE STRUCTURES TO BE CLEANED. *Curb and gutter, removal and replacement, is not included in this pay item. The unit price shall include all equipment, materials and labor required to clean and grout the drainage structure.*

**Z0027800 GEOTECHNICAL FABRIC**

Description. This work shall consist of furnishing the geotechnical materials required for Metra Forces to complete the installation of the temporary platforms. The geotechnical items provided by the contractor will include, but may not be limited to, the following items:

14'w GEOTECHNICAL FILTER FABRIC (115MILS) – 385 LINEAR FEET

The contractor shall submit material specifications to owner's engineer for Metra approval prior to ordering of material. All material provided shall conform to the Metra approved list of materials, to be furnished for construction.

Basis of Payment. This work will be paid for at the contract unit price per SQUARE YARD for GEOTECHNICAL FABRIC, regardless of size and material.

**Z0029602 TEMPORARY SIGNING**

**Description:** This work shall consist of the furnishing and installing temporary signage as required for the project at the project site.

**General:** *The Contractor shall furnish all components for installation of the temporary signing including any concrete used to anchor sign posts, bracing, guy wires, posts, and/or gates. The temporary signing shall be removed at the end of use and all removed materials shall be disposed of outside the limits of the right-of-way according to Article 202.03 of the "Standard Specifications" and/or as directed by the Engineer.*

*A total of Eight (8) signs will be needed as part of the temporary signing – including two (2) signs at the platform, two (2) signs at each temporary pedestrian crossing, for four (4) total, and two (2) signs for Quiet Zone Designation at the Temporary Runaround crossing.*

**Method of Measurement:** The temporary signage required will be measured as EACH.

**Basis of Payment:** This work will be paid for at the contract unit price per EACH for TEMPORARY SIGNING.

**Z0048400 RAILROAD CROSSING REMOVAL**

Description: This work includes furnishing all labor, material, and equipment for the removal of the existing and temporary railroad crossings. The removal of the existing crossing will be performed in conjunction with the removal of a section of the permanent track to accommodate the bridge construction. The removal of the temporary crossing of the temporary shoofly track will be performed in conjunction with the track removal. The final removal of the temporary crossing in the permanent track will be performed by CN force when the temporary roadway run-around is removed at the end of the project.

The Contractor shall remove and dispose of all crossing panels and associated hardware in a suitable manner off-site and in accordance with the Standard Specifications.

Payment for RAILROAD CROSSING REMOVAL shall be per Each crossing.

**Z0069700 SUB-BALLAST**

Description: Sub-ballast shall be crushed stone and shall meet the requirements as set out in the IDOT Standard Specification, Section 1004, Coarse Aggregate. The Sub-ballast shall be gradation CA 6.

The Sub-ballast shall be spread on a graded roadbed as a base in the areas shown on the plans with a minimum thickness of 12 inches placed in 6-inch lifts and be compacted to 95 percent of the maximum dry density using the Modified Proctor test.

The Sub-ballast shall be placed within 0.5" of plan elevations.

Payment: Payment for SUB-BALLAST shall be per Cubic Yard.



## **Z0070200 SURVEY MONUMENTS**

**Description:** This work shall consist of installing survey monument(s) at the location(s) shown on the plans.

**Materials:** The Lake County Division of Transportation will supply the survey monument(s). The Contractor shall supply all the materials necessary to install the monument(s).

**General:** After the final surface course has been placed the Engineer will install four survey nails for each point to be monumented. Survey nails shall be magnetized steel with zinc plating. Survey nails shall be approved by the Engineer before installation. The Contractor shall use the following procedure to install the survey monuments:

1. At each monument location, the Contractor shall install four survey nails in the surface. Each nail shall be one foot from the center and in a direct line with the opposite nail to be used for setting the new monument.
2. The Contractor shall use a hammer drill mounted with a 1¼" diameter masonry bit, to drill a hole 4½" deep, centered within the four survey nails.
3. The Contractor shall use a drilling machine mounted with a four inch diamond core bit, to cut a hole, ¾" deep, centered on the initial hole. The Contractor shall chisel out the hole to a level depth of ¾".
4. The Contractor shall fill the hole with an epoxy adhesive. The adhesive shall be a two-component epoxy adhesive. Adhesive shall meet the requirements of ASTM Specification C881, Type IV, Grade 3 for temperatures at or above 50°F or AASHTO Specification M237-90, Table 2 Type III for the two component, epoxy adhesive if the temperature is between 31°F and 50°F. Adhesive shall be approved by the Engineer before installation.
5. The Contractor shall place the new monument in the center of the hole. Set the monument so that the center of the legend top is ⅜" below the pavement surface. Aggregate can be used to adjust the monument elevation to obtain the correct depth.
6. The Contractor shall use the four survey nails and a string line or ⅛" chalk line to center the monument in the hole to the nearest 0.005 foot. This can be accomplished by drawing the string across two diagonally opposite survey nails.
7. Each monument shall be protected from traffic for a minimum of 90 minutes.

**Basis of Payment:** This work will be paid for at the contract unit price per each for SURVEY MONUMENTS. *The unit price shall include all labor, equipment and materials required to complete the monument installation.*

**Z0076000 TRACK INSTALLATION COMPLETE**

Description: This work shall consist of furnishing all labor, material, and equipment for constructing railroad track. This work includes the portions of the temporary shoofly track and the portion of the permanent CN track for which track work can be performed at a distance greater than 12.5-feet from the centerline of the Railroad's in-service track. Construction of track shall include supplying all labor, material and equipment required for the track system – including rail, cross ties, other track material, ballast and surfacing for the construction of the complete track system. This work does not include performing construction of any railroad signal systems.

Track Materials: Materials used in the construction of the track shall conform to the following specifications:

Rail: New 136 lb. RE Jointed rail with 6 hole joint bars shall be used for the temporary shoofly track and new 136 lb. CWR shall be used for the permanent CN mainline track, per CN Specifications. Full length rail shall be used except in cutting closures. No rail shorter than 33' long on curves and 19'6" on tangents shall be used. When necessary to cut rail, cut must be squarely made using approved rail saw and required bolt holes drilled for full bolting of rail joints. Field drilled holes must be peened. Torch cut rail ends or holes are not permitted in any running rails. Joints should be spaced so the joint on one rail falls at the midpoint of the opposite rail.

Ties: Cross ties shall be new 8'6" length 7" AREMA grade cross ties for track and 10' length 7" AREMA grade cross ties for all crossings. Cross ties shall conform to Chapter 30, Part 3 Section 3.1 of the AREMA manual. Ties shall be pressured treated with creosote-type preservatives to conform to Chapter 30, Part 3 Section 3.7 of the AREMA manual.

Cross ties will be uniformly spaced 19.5 inches on center.

Tie plates shall be new 7 3/4" X 14" double shoulder 8 hole punch for 6-inch base rail AREMA Plan No. 12 subject to approval by CN. Tie plates shall be placed with the shoulder squarely against the rail, no cocked tie plates will be permitted.

Joint Bars: Joint bars shall be new toeless 6-hole bars in accordance with Chapter 4, Parts 1 and 2 of the AREMA Manual. All joint bars must be fully bolted.

Compromise Joint Bars: Compromise joints must be used for connecting rails of different section. Bars must be new and shall consist of one right-hand pair and one left-hand pair, full angle type. Length, size and drilling shall be compatible with the connecting rail.

Track Spikes: Track spikes shall be new 5/8 inch square, 6 inches in length, in accordance with Chapter 5, Part 2 of the AREMA Manual.

The rail shall be spiked to the ties with 4 spikes per rail per tie (2 line spikes and 2 plate hold down spikes). The spikes will be staggered so adjacent spikes will not be near the same edge of the tie.

**Anchors:** Rail anchors shall be new one piece drive on type. Every other tie shall be box anchored except no anchors shall be applied within the limits of joint bars.

**Gauge:** The distance measured at right angles, 5/8 inch below the top of the rail, between the two inside faces of the rail. Standard gauge is 4' 8 1/2".

**Ballast:** Ballast shall be crushed granite, per CN specifications (limestone, dolomite or slag will not be allowed), subject to approval by CN. Ballast for the permanent main track and the temporary shoofly track shall conform to Section 2.10.4 of the AREMA Manual. AREMA size No. 5 shall be used.

Ballast shall be inserted under the ties in convenient lifts, but not less than two lifts. Proper cross level, line and grade as shown in approved plans will be attained in the final lift. Ballast is to be thoroughly tamped from each tie end to 15 inches inside the rail. Centers are to be filled full but not tamped. A 4-inch layer of ballast may be spread and compacted prior to placement of rail and ties if desired. Ballast or crushed stone walkway material between adjacent tracks and between track and adjacent roadways and/or platforms will be uniformly dressed to provide safe footing.

**Welded Rail:** Orgo-Thermit Field Welds or Flash Butt Welds. Welds shall be installed and tested per CN specifications. Only welders qualified by CN will be allowed to perform any of the field welding that will be required. CN-qualified welders include the following:

Bankhead Railway Services, Inc.  
1080 Donald L. Hollowell Pkwy.  
Atlanta, GA 30318  
Phone: 404-894-7924  
Fax: 404-894-7937

Orgo-Thermit, Inc.  
3500 Colonial Drive North  
Manchester, NJ 08759  
Phone: (732)657-5781, Ext. 26  
Fax: (732)657-1047

Railtech Boutet, Inc.  
25 Interstate Dr., P.O. Box 69  
Napoleon, OH 43545  
Phone: (419)592-5050  
Fax: (419)599-3630

Payment: Payment for TRACK INSTALLATION COMPLETE shall be per lineal foot of track.

**Z0076100 TRACK REMOVAL**

Description: This work shall consist of furnishing all labor, material, and equipment for complete removal of the railroad track including rail, ties, other track material and ballast. A section of the permanent main track will be removed after the shoofly track is in service to accommodate the bridge construction. The shoofly track will be removed at the end of the project after the permanent main track is placed back in service over the new bridge structure.

The Contractor shall remove and dispose of all track materials in a suitable manner off-site and in accordance with the Standard Specifications. The Contractor's bid prices for Track Removal shall reflect his receiving the salvage value of these materials.

Payment: Payment for TRACK REMOVAL shall be per Foot of track.

**Z0076300 TRACK WORK**

Description: Track Work consists of the raise and surfacing the existing track and shall include furnishing all labor and equipment to raise, tamp, surface align and dress ballast for raising the existing track to the final profile elevation. The labor to unload and distribute the ballast is included in this work. The ballast material is covered in another item.

The track shall be raised in successive lifts not to exceed four (4) inches per lift. The ballast shall be thoroughly tamped under the ends of each tie extending from 15 inches inside the rail to the end of the tie on each successive lift. The center shall be filled full with ballast but not tamped. The track shall be brought to the final line and surface on the final lift. The ballast shall be dressed to the section shown in the plans.

Payment: Payment for TRACK WORK shall be per Foot of track.

## **LAKE COUNTY PUBLIC WORKS SPECIAL PROVISIONS**

### **LAKE COUNTY PUBLIC WORKS SANITARY SEWER AND STORM WATER PUMPING STATION SPECIAL PROVISIONS**

#### **A. REFERENCE SPECIFICATIONS**

- (1) All sanitary improvements shall be constructed in accordance with the material, installation and testing requirements of the "Standard Specifications for Water and Sewer Main Construction in Illinois" current edition; except where said requirements are modified by these Special Provisions.
- (2) References to "Standard Specifications" or "IDOT" requirements or standards shall mean in conformance to the material, installation and testing requirements of the Illinois Department of Transportation's "Standard Specifications for Road and Bridge Construction," current edition including all applicable current Supplemental Specifications.
- (3) References to "LCPW" requirements, details, or standards shall mean conformance to the materials, installation and testing requirements of the Standards for Water and Sewer Main Construction in Lake County Public Works Service Areas and LCPW Sewage Pumping Stations Design Standards. All sanitary improvements shall meet LCPW requirements. In case of conflict with any part or parts of the above specifications, the said LCPW requirements, details, or standards and these Special Provisions shall take precedence and shall govern.

#### **B. PAY ITEM SPECIFIC SPECIAL PROVISIONS**

All incidental work required to complete the sanitary relocations/construction and storm water pumping station, including but not limited to excavation, sheeting and shoring, granular bedding, installation of all necessary items and materials, fittings, thrust blocks, joint restraints, placement of compacted backfill, offsite disposal of surplus excavated materials, and testing will be considered included in the various sanitary sewer system and storm water pumping station pay items. The following special provisions are either for non-IDOT standard pay items or serve to modify IDOT standard pay items. Additionally they address the Basis of Payment for the various sanitary and storm water pumping station related pay items.

**56300100 ADJUSTING SANITARY SEWERS, 8-INCH DIAMETER OR LESS**

Description. This work shall consist of replacing a portion of the sanitary sewer main at service connections and adjusting sanitary sewer services. Except where modified by these special provisions, this work shall be performed in accordance with the applicable Articles of Section 563 of the Standard Specifications.

Materials. All sanitary sewer shall be PVC-ASTM D-3034, SDR 26. The joint for sewer main shall be push-on gasket type and the joints for sewer services shall be flexible elastomeric seals, both conforming to ASTM D-3212. Bedding and backfill material to one foot above the pipe shall be placed in accordance with ASTM D-2321-89, Class 1B embedment material. Gradation shall be CA-7.

General. In addition to the provisions of Article 563.03, the following shall apply. If necessary to achieve proper clearance and minimum slope requirements, the portion of the existing sewer main containing the service connection shall be removed and replaced with a new pipe tee. Mission couplings shall be used to connect the tee to the main. Services shall be 6" diameter or match existing, whichever is larger, and minimum slope shall be 1.00%. Where the existing service joins the new service, a reducer shall be provided if the existing service is not 6" diameter and mission couplings shall be used to connect the existing and new service pipes.

Repairs of any damage to existing sanitary sewers by the contractor will be included in this item.

Method of Measurement. This work will be measured for payment in place in feet. The length measured will include tees and reducers.

Basis of Payment. This work will be paid for at the contract unit price per foot for ADJUSTING SANITARY SEWERS, 8-INCH DIAMETER OR LESS which price shall include replacing the existing service connection/tee on the sewer main regardless of the main size and furnishing all materials.

**X0322464 ABANDON AND FILL EXISTING SANITARY MANHOLE**

Description. This work shall be in accordance with the "Standard Specifications for Water and Sewer Construction in Illinois, Current Edition" and consists of the abandonment of sanitary sewer manholes. Work includes saw-cutting, removal and disposal of existing pavements; excavation; removal and disposal of waste excavated materials; removal of water from the trench, temporary shut-downs; bypass pumping of sanitary sewage flow as needed; removing portions of existing sanitary sewer, complete removal of manhole frames and covers; capping or plugging abandoned sanitary sewer; and filling excavations and structures with compacted granular backfill materials.

The tops of manholes shall be removed to a depth of three feet below proposed ground level or pavement surface. The remaining portions of the manholes shall be filled with compacted granular backfill materials.

Plug the ends of sanitary sewer pipes to be abandoned with concrete or mortar and brick plugs at least 18 inches long. Where indicated on the plans or as directed by the Engineer and when within 10 feet of or under any proposed use pavement, filling the entire inside diameter of the pipes with controlled low strength material (flowable fill).

All sanitary manhole frames and covers removed during water main abandonment shall be delivered to the Lake County Public Works Department.

Method of Measurement. This work will be measured for payment per EACH.

Basis of Payment. Work shall be paid as ABANDON AND FILL EXISTING SANITARY MANHOLE, and shall include cutting and removal of sanitary sewer, removal of frames and covers, furnishing and placing compacted granular backfill and controlled low strength material, and furnishing and placing plugs.



**X0326712 ABANDON AND FILL EXISTING SANITARY SEWER**

Description. This work shall be in accordance with the "Standard Specifications for Water and Sewer Construction in Illinois, Current Edition" and consists of the abandonment of sanitary sewer manholes. Work includes saw-cutting, removal and disposal of existing pavements; excavation; removal and disposal of waste excavated materials; removal of water from the trench, temporary shut-downs; bypass pumping of sanitary sewage flow as needed; removing portions of existing sanitary sewer; capping or plugging abandoned sanitary sewer; and filling excavations and structures with compacted granular backfill materials.

Plug the ends of sanitary sewer pipes to be abandoned with concrete or mortar and brick plugs at least 18 inches long. Where indicated on the plans or as directed by the Engineer and when within 10 feet of or under any proposed use pavement, filling the entire inside diameter of the pipes with controlled low strength material (flowable fill).

Method of Measurement. This work will be measured for payment per EACH, for each segment of sanitary sewer to be abandoned.

Basis of Payment. Work shall be paid as ABANDON AND FILL EXISTING SANITARY SEWER, and shall include cutting and removal of sanitary sewer, furnishing and placing controlled low strength material, and furnishing and placing plugs.

**X0327679 STEEL CASING PIPE AUGERED AND JACKED 30”**

Description. Where indicated on the Plans sanitary, storm and water utility pipes shall be installed in a watertight casing pipe that has been augered and jacked in place. This work shall be performed in accordance with the detail provided in the Plans and as directed by the Engineer.

Methods and Materials.

Casing pipe – Steel Pipe - ASTM A139, Grade B, minimum yield strength 35,000 psi, minimum wall thickness 0.375 inch with welded joints. All pipe shall be coated inside and out with at least one shop coat of an approved primer paint. In addition the external surface shall be treated with one coat of coal tar epoxy or asphaltum paint. The full circumference of any joints shall be welded such that the casing pipe is continuous

Casing spacers - The utility (carrier) pipe shall be inserted into and supported within the casing pipe by the use of casing spacers. Spacers shall have a stainless steel shell with PVC lining, stainless steel bolts, and ultra high molecular weight polymer runners. Spacers shall be configured to provide restraint against utility pipe movement due to flotation. Spacer interval shall be as recommended by the manufacturer.

Self-restraining casing spacers - Additionally force mains and water mains shall be installed with self-restraining casing spacers that provide axial thrust restraint to prevent pipe joint separation. Restrained casing spacers shall be provided at all pipe joints.

Void space fill - The void space between the casing pipe and the utility (carrier) pipe shall be filled with sand or other approved material.

End seals - Ends of the casing pipe shall be sealed with rubber end seals secured in place with stainless steel bands.

Jacking and receiving pits shall be located so as to avoid conflicts with existing utilities.

The casing pipe shall be installed using equipment that encases the hole as the earth is removed. Augering without the concurrent installation of a casing pipe will be not permitted. All joints in casing pipe shall be continuously welded. The casing pipe shall extend the entire length indicated on the plans and be installed in a manner that will not disrupt traffic nor surface grades and facilities. The introduction of water as an excavator is prohibited.

The shoring with the augering/jacking pits shall be designed, erected, supported, braced, and maintained such that it will safely support all vertical and lateral loads that may be imposed on them during construction.

All work shall otherwise conform to the applicable Articles of Sections 550 and 552.

Basis of Payment. This work will be paid for at the contract unit price per foot for STEEL CASING PIPE AUGERED AND JACKED 30”. All excavation and disposal, shoring design, construction, and removal, trench backfill, carrier pipe installation, casing spacers, void space fill, end seals, and all other materials, equipment and labor necessary to complete this work will be included in this price.

The carrier pipe will be paid for under the applicable pay item for that type of pipe. Trench backfill, where required, will be paid for according to Article 208.04.

**X0335700 PUMP STATION GENERAL WORK**

Description. This item shall include general work for construction of the Pump Station as per the plans and the specifications and shall include excavation, dewatering, installation, earth retention systems, backfilling, compacting, etc. for construction of the Pump Station Wet Well Vault and Control House foundation as well as concrete, reinforcing steel, bollards, accessories, and attachments. This work shall include coordination with utilities for electrical, gas, and telephone/data service and coordination of electrical and mechanical components including size and location of wall penetrations and attachments.

The Contractor is advised to review the site and familiarize himself with the soil conditions prior to finalizing their bid for this portion of the work. No additional compensation shall be allowed for changes in the construction method due to found conditions that may exist at the time of construction.

The Contractor shall take all necessary precautions to prevent the undermining of the roadways, structures, embankments or property including the utilization of trench boxes, sheeting, etc. to properly maintain the excavation such that underlying soils between the pavement edge etc. and jacking limits are prevented from entering the excavation. In the event that settlement or any other damage occurs to adjacent roadways, and property or structures between the time the installation is completed and the end of the contract bind guaranty period, the Contractor shall be fully responsible for any repairs deemed necessary by the Engineer.

**STRUCTURES**

- A. A Pump Station structure shall be provided as shown on the Drawings and shall consist of a reinforced flat slab top, an intermediate slab, walls, and a poured-in-place reinforced concrete base slab. The interior of the concrete shall be coated with a minimum of ½" of a coating approved by LCPWD such as Sewper Coat PG, Quadex Aluminaliner, or Permacast MS-10,000. The wet well shall have inside dimensions and inside height as shown on the drawings. The access frame and hinged covers shall be cast into the slab.
- B. The Control House foundation shall be provided as shown on the Drawings and shall consist of cast-in-place reinforced concrete slab on strip footings.

**MATERIALS**

- A. Concrete: Class SI Concrete per Article 1021.03 (c.) of the Standard Specifications
- B. Reinforcing Steel: ASTM A615, grade 60 unless per the Standard Specifications.

## ACCESSORIES

- A. Provide pump access hatch cast into the flat slab top section. The angle frame floor access hatch shall be sized specifically to the plans.
  - 1. Covers: ¼ inch aluminum diamond plate covers reinforced for 500 psf live load. Equipped with cast aluminum flush lifting handle and 316 stainless steel hold-open arms with red vinyl grips that automatically keep the covers in their open/upright positions.
  - 2. Frame: The design of the frame shall be of the “trough-style” that will allow water from the covers to collect within the frame and drain through a single drain hole in the bottom of the frame.
  - 3. Hardware: 316 stainless steel hinges and tamper resistant bolts/lock nuts.
  - 4. Security: Stainless steel locking hasps shall be furnished for each cover.
- B. Provide permanent bollards along the east edge of the pump vault. Concrete filled pipe bollards shall be permanently installed in accordance with the details shown in the plans and the provisions included herein. The pipe bollard exterior shall be polyester dry powder coated or painted with one primer coat and two finish coats. Red and white retro-reflective tape shall be installed around the bollards shown in the plans.
- C. Provide metal handrail as shown on the Drawings. Handrails shall meet all OSHA requirements and shall be of tubular round steel, hot-dipped galvanized after fabrication.

## INSTALLATION

Excavation, trenching, grouting, concreting, or backfilling required for the installation of the Pump Station Wet Well Vault and Control House foundation shall be performed by the Contractor as part of this work. Excavation and backfill shall be in accordance with applicable IDOT Standard Specifications.

## PLACEMENT

Install structure to conform to locations and dimensions shown on Drawings.

Basis of Payment. This work shall be paid for at the contract unit price per lump sum for PUMP STATION GENERAL WORK.

This price shall be full compensation for furnishing all materials; and for all preparation, excavation, dewatering, installation, earth retention systems, backfilling, compacting, etc. as well as reinforced concrete for the Pump Station General Work and for all labor, equipment, tools, and incidentals necessary to complete the Work.

**X0783300 PUMP STATION ELECTRICAL WORK**

1.1 SCOPE OF WORK

- A. The Contractor shall furnish and install all new materials as indicated on the Electrical drawings, and/or in these specifications, and all items required to make his portion of the Electrical/Technology work a finished and working system.
- B. This Specification and the Electrical Drawings govern furnishing, installing, testing and placing into satisfactory operation the Electrical Systems.
- C. Description of Electrical/Technology Systems shall be as follows:
  - 1. Temporary Electrical/Technology power & terminations to the main electrical panel & pump control panel, including all raceways, wiring, technology cable, and equipment supports. This Contractor shall remove temporary items at the completion of the project.
  - 2. Electrical and Technology services including utility & standby power distribution generator equipment, wiring, raceways assemblies, flexible conduits and terminations in accordance with the contract documents.
  - 3. Grounding for electrical and technology systems.
  - 4. Site electrical raceways and wiring in accordance with the electrical utility company service provider for incoming electrical service.
  - 5. Site technology raceways in accordance with the Owner's information technology requirements and technology utility company service provider for incoming telephone service.
  - 6. Technology (SCADA system and antenna/radio tower) infrastructure and components including but not limited to antenna/radio tower, foundation, coaxial cable, lightning arrestors, raceways & control wiring in accordance with the contract documents and owner's information technology representative requirements.
  - 7. Housekeeping concrete pad for technology and electrical equipment in accordance with the contract documents and owner's information technology representative requirements.
  - 8. Communications wiring associated with generator equipment accessories (generator annunciator panel, emergency power off push button), automatic transfer switch, SCADA and antenna/radio tower in accordance with the contract documents and owner's information technology representative requirements.
  - 9. Raceways, wiring and cable to equipment furnished by others.

10. Class 1, Division 2 electrical/technology equipment and terminations inside Pump Station Vault.
11. Arc-Flash & Short Circuit overcurrent protective device coordination study.

D. Work Not Included:

1. Site electrical utility company transformer, associated overcurrent protection, grounding, incoming primary electrical wiring, and terminations shall be installed by the electrical utility company.
2. Site electrical utility company revenue meter shall be installed in accordance with the electrical utility company.

1.2 OWNER FURNISHED PRODUCTS

- A. The Owner will supply manufacturer's installation data for new equipment purchased by the Owner for this project.
- B. This Contractor shall make all electrical and technology system connections shown on the drawings or required for fully functional units.
- C. This Contractor is responsible for all damage to Owner furnished equipment caused during installation.

1.3 SUBMITTALS

- A. Submittals shall be required for the following referenced items where required elsewhere in the specifications or on the drawings.
  1. Arc-Flash & Short Circuit overcurrent protective device coordination study.
  2. Surge protective devices.
  3. Outdoor metering cabinet in accordance with the electrical utility company requirements (electric meter supplied by the electrical utility company).
  4. Emergency unit batteries.
  5. Lighting Controls (i.e., photocell, astronomical timeclock).
  6. Panelboards.
  7. Disconnect switches.
  8. Low voltage transformers.

9. Standby generator (including generator control panel, generator annunciator panel, generator battery charger, generator block heater & generator power-off remote pushbutton).
  10. Automatic transfer switch.
  11. Variable frequency drives.
  12. Lighting
  13. SCADA system and components.
  14. Antenna/Radio tower and components.
- B. All submittals and shop drawings shall be submitted to the Engineer and Lake County Public Works for approval.

#### 1.4 COORDINATION

- A. Contractors shall use a coordination process to identify the proper sequence of installation of all Electrical and Technology systems to ensure an orderly and coordinated end result, and to provide access for service and maintenance.
- B. Where the Electrical Contractor is required to install raceway, and/or power connections in support of SCADA, Antenna/Radio & Fiber Optic equipment; prior to the final installation a coordination meeting between the Owner's Information Technology Representative and Electrical Contractor shall be convened to determine the exact location and requirements of the installation. Carefully coordinate associated SCADA, Antenna/Radio & Fiber Optic scope of work & cost. Include all costs at the time of bidding.

### PART 2 - QUALITY ASSURANCE

#### 2.1 COMPLIANCE WITH CODES, LAWS, ORDINANCES

- A. Conform to all requirements of Village of Grayslake, Illinois Codes, Laws, Ordinances, Lake County Public Works Published Standards and other regulations having jurisdiction over this installation.
- B. If the Contractor notes, at the time of bidding, any parts of the drawings or specifications that do not comply with codes or regulations, he shall inform the Engineer in writing, requesting a clarification. If requested, the Contractor shall submit with his request for clarification a separate price to bring the system into compliance with the codes and regulations.
- C. If there is a discrepancy between manufacturer's recommendations and these specifications, the manufacturer's recommendations shall govern.

- D. If there are no local codes having jurisdiction, the current issue of the National Electrical Code shall be followed.

## 2.2 PERMIT, FEES, TAXES, INSPECTIONS:

- A. Procure all applicable permits and licenses.
- B. Abide by all laws, regulations, ordinances, and other rules of the State or Political Subdivision where the work is done, or as required by any duly constituted public authority.
- C. Pay all charges for permits or licenses.
- D. Pay all fees and taxes imposed by the State, Municipal, and other regulatory bodies.
- E. Pay all charges arising out of required inspections by an authorized body.
- F. Pay all charges arising out of required contract document reviews associated with the project and as initiated by the Owner or authorized agency/consultant.
- G. Where applicable, all equipment and materials shall be listed by Underwriter's Laboratories, Inc. or a nationally recognized testing organization.

## 2.3 EXAMINATION OF DRAWINGS

- A. The Contractor shall determine quantities and quality of material and equipment required from the documents. Where discrepancies arise between drawings, schedules and/or specifications, the greater quantity and/or higher quality shall govern.
- B. Scaling of the drawings will not be permitted for determining equipment locations. Refer to architectural/structural drawings for exact locations.
- C. The drawings for the electrical and technology work are diagrammatic, intended to convey the scope of the work and to indicate the general arrangements and locations of equipment, outlets, etc., and the approximate sizes of equipment.
- D. Contractor shall determine the exact locations of equipment and rough-ins, and the exact routing of raceways so as to best fit the layout of the job.
- E. Where job conditions require reasonable changes in arrangements and locations, such changes shall be made by the Contractor at no additional cost to the Owner. Changes requiring additional cost shall not be made without signed consent of the Owner.

## 2.4 FIELD MEASUREMENT

- A. Verify all pertinent dimensions at the job site before ordering any raceway, conductors, fittings, etc.



2.5 PRODUCT DELIVERY, STORAGE, HANDLING AND MAINTENANCE

- A. Exercise care in transporting and handling to avoid damage to materials. Store materials on the site to prevent damage.
- B. Keep all materials clean, dry and free from damaging environments.
- C. Coordinate installation of large equipment with the Engineer and Owner. If the Electrical Contractor does not have prior documented experience in rigging and lifting similar equipment, he/she shall contract with a qualified lifting and rigging service that has similar documented experience. Follow all equipment lifting and support guidelines for handling and moving.

2.6 INSURANCE

This Contractor shall maintain insurance coverage during construction.

2.7 WARRANTY

- A. Provide one-year warranty for all equipment, and materials from the date of equipment start-up, unless noted otherwise.
- B. Provide five-year warranty for all stand-by generator equipment from the date of equipment start-up.

2.8 MATERIAL SUBSTITUTION

- A. Where several manufacturer names are given, the manufacturer for which a catalog number is given is the basis of design and establishes the quality required.
- B. Equivalent equipment manufactured by the other named manufacturers may be used, subject to review by the Engineer. Contractor shall ensure that all terms submitted by these other manufacturers meet all requirements of the drawings and specifications, and fit in the allocated space. The Engineer shall make the final determination of whether a product is equivalent.
- C. Voluntary add or deduct prices for alternate materials may be listed on the bid form. These items will not be used in determining the low bidder. This Contractor assumes all costs incurred as a result of using the offered material or equipment on his part or on the part on other Contractors whose work is affected.
- D. All material substitutions requested after the final addendum must be listed as voluntary changes on the bid form.

## PART 3 - EXECUTION

### 3.1 JOBSITE SAFETY

- A. The Contractor is solely responsible for jobsite safety. The Engineer and the Engineer's consultants shall be indemnified and shall be made additional insurers under the Contractor's general liability insurance policy. The Engineer and his or her personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions.

### 3.2 EXCAVATION, FILL, BACKFILL, COMPACTION

- A. Prior to the commencement of any excavation or digging, the Contractor shall verify all underground utilities with the regional utility locator. Provide notice to the locator before excavations.
- B. The Contractor shall do all excavating, filling, backfilling, compacting, and restoration in connection with his work.
- C. Protect excavations against frost and freezing.
- D. Bidders shall visit the premises and determine the soil conditions by actual observations, borings, or other means. The cost of all such inspections, borings, etc. shall be borne by the bidder.
- E. Furnish, install, operate and remove all dewatering pumps and pipes needed to keep trenches and pits free of water.
- F. Known underground piping, raceway, foundations, and other obstructions in the vicinity of construction are shown on the drawings. Review all Bid Documents for all trades on the project to determine obstructions indicated. Exercise care in making installations near underground obstructions.
- G. If objects not shown on the drawings are encountered, remove, relocate, or perform extra work as directed by the Engineer or Electrical & Technology Utility Company.
- H. No rubbish or waste material is permitted for fill or backfill. Water is not permitted to rise in un-backfilled trenches
- I. Furnish all necessary material for backfilling.
- J. Conduits that are concrete encased or in a ductbank, conduit spacers, and cradles shall be installed on a bed of compacted CA-6 gravel.
- K. Conduits that are not concrete encased, shall be laid on a compacted bed of sand at least 3" deep. Backfill around conduits with sand, in 6" layers and compact each layer.

- L. Dispose the excess excavated earth as directed by the Construction Manager.

### 3.3 ENGINEER OBSERVATION OF WORK

- A. The Contractor shall provide two (2) calendar weeks' notice to the Engineer prior to:

- 1. Placing fill over underground electrical and technology utilities.

- B. The Engineer will review the installation and provide a written report noting deficiencies requiring correction. The Contractor's schedule shall account for these reviews and show them as line items in the approved schedule.

- C. OPERATION AND MAINTENANCE INSTRUCTIONS:

- 1. Provide Electronic Operation and Maintenance Instructions in a single electronic file. The file format shall be Portable Document Format (PDF).

- 2. Title page with project title, Engineer, Contractor, and Subcontractors with addresses, telephone numbers, and contacts.

- 3. Copies of warranties shall be included in the section for the equipment being warranted.

- 4. Copies of all final approved shop drawings and submittals.

- 5. Maintenance schedules and procedures.

- 6. Arc-Flash & Short Circuit overcurrent protective device coordination study.

- D. INSTRUCTING THE OWNER'S REPRESENTATIVE

- 1. Adequately instruct the Owner's designated representatives (by factory personnel) in the maintenance, care, and operation of the complete systems installed under this contract.

- 2. Contractor shall engage the services of factory trained and certified personnel to conduct one (2) two-hour training sessions on the operation and maintenance of the electrical generator, associated automatic transfer switch and power distribution equipment.

- E. RECORD DOCUMENTS

- 1. Contractor shall maintain at the job site a separate and complete set of electrical drawings and specifications completely detailing all changes made to the systems clearly and permanently marked in red.

F. SYSTEM COMMISSIONING

1. The electrical systems shall be complete and operating. System start-up, testing, and satisfactory system performance is the responsibility of the Contractor. This includes all calibration and adjustment of electrical controls, balancing of loads, troubleshooting and final adjustments that may be needed.

G. FIELD QUALITY CONTROL

1. Conduct all tests required during and after construction.
2. All cables and wires shall be tested for shorts and grounds following installation and connection to devices. Replace shorted or grounded wires and cables.
3. Any wiring device, electrical apparatus or lighting fixture, if grounded or shorted on any integral "live" part, shall have all defective parts or materials replaced.
4. Test cable insulation for proper insulation values not less than the National Electrical Code Standards. Test shall include the cable, all splices, and all terminations.
5. Test all other equipment furnished and installed by the Contractor to assure that the equipment is electrically sound, all connections properly made. Verify that phase rotation correct, there is suitable protection against overloads, that voltage complies with equipment nameplate rating, and full load amperage is within equipment rating.
6. Contractor shall perform thermo-graphic study on new electrical gear, generator equipment, panelboards, etc. at the end of construction to identify any unusual conditions/heating within the equipment. Coordinate with Construction Manager to have an Owner/Engineer representative present during testing.
7. Upon the completion of the project, the Contractor shall provide amperage readings for all gear, generator equipment, panelboards and turn the results over to the Construction Manager/Owner for "benchmark" amperages.

3.4 GROUNDING AND BONDING

- A. Material: Copper.
- B. Comply with NFPA 70, article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.
- C. Install equipment grounding conductors in all feeders and circuits. Terminate each end on a grounding lug or bus.
- D. Equipment grounding conductors: insulated with green-colored insulation.

- E. Grounding electrode conductors: stranded cable.
- F. Grounding bus: bare, annealed copper bars of rectangular cross section, with insulators.
- G. Exothermic-welded connections: comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
- H. Grounding electrode conductor (GEC) shall be protected from physical damage by rigid galvanized steel (RGC) conduit in exposed locations.
- I. Technology remote control and signaling circuits shall be bonded in accordance with the most recent version of the National Electric Code.
- J. A ground continuity test shall be made between main ground system and equipment frame, and system neutral. A minimum of ten amps d.c. shall be used between ground references and each ground point tested. Resistance shall be calculated and shall not exceed 25 ohms.
- K. Any wiring device, electrical apparatus or luminaire, if grounded or shorted on any integral "live" part, shall have all defective parts or material replaced.

### 3.5 CONDUITS AND FITTINGS

- A. Section includes: Rigid galvanized steel (RGS) conduit, intermediate metallic conduit (IMC), electrical metallic tubing (EMT), flexible metallic conduit (FMC), liquidtight flexible metallic conduit (LFMC), rigid non-metallic conduit, polyvinyl chloride (PVC).
- B. No conduits shall be filled to greater than 50 percent capacity. Every conduit longer than ten (10) feet shall have a nylon pull line installed with the conductors.
- C. All conduits shall be 3/4 inch minimum. All empty conduits shall have nylon pulling string.
- D. Electrical metallic tubing (EMT) "thin wall" conduit 2 inches and smaller shall be hot-dipped galvanized when used for lighting and power circuits.
- E. EMT coupling and connectors for all conduits shall be compression type fittings with insulated throats.
- F. Flexible conduit for floor mounted equipment shall be galvanized steel, 3/4 inch minimum size, except for lighting fixture whips that may be 3/8 inch minimum size. Length of flexible conduit shall be six (6) feet maximum.
- G. Install IMT conduit exposed for all distribution panel feeders, branch panel feeders, branch circuits, mechanical equipment, controls, and control circuit conductors.
- H. Install RGS conduit exposed in all wet or damp locations.

- I. Install PVC coated rigid metal conduit in all corrosive locations.
- J. Install RGS conduit within 5'-0" of the perimeter of the building foundation and in hazardous locations as defined by the national electrical code.
- K. Install concrete encased schedule 40 PVC conduit under roads, drives and paved areas, unless otherwise noted.
- L. Acceptable manufacturers: Appleton Electric, Allied, Steelduct, LTV, Wheatland Tube Co., O-Z Gedney, Thomas & Betts, Crouse-Hinds or approved equal.

### 3.6 FUSES

- A. Where ambient temperature to which fuses are directly exposed is less than 40 degrees Fahrenheit or more than 100 degrees Fahrenheit, apply manufacture's ambient temperature adjustment factors to fuse ratings.
- B. Fuses with ratings larger than 200 amperes but equal to or less than 600 amperes: Class RK-1 (time-delay).
- C. Fuses with ratings less than or equal to 200 amperes (not including control transformer fuses): class RK-5.
- D. Control transformer fuses: Class CC (time delay).
- E. Fuses for packaged equipment: size and type as recommended by equipment manufacturer.
- F. Install fuse with label oriented such that manufacturer, type, and size are easily read.
- G. Acceptable manufacturer: Ferraz Shawmut.

### 3.7 WIRE AND CABLE

- A. The basis of design is copper conductors (THHN/THWN Indoors; XHHW-2 Outdoors) installed in raceways based on ambient temperature of 86-degrees Fahrenheit, per the National Electrical Code Table 310.16.
- B. The contractor shall be responsible for derating and sizing conductors and conduits to equal or exceed the ampacity of the basis of design circuits, if he/she chooses to use methods or materials other than the basis of design.
- C. Use no wire smaller than 12 AWG for power and lighting circuits, and no smaller than 14 AWG for control wiring.
- D. Use no wire smaller than 18 AWG for low voltage control wiring (<100 volts).

- E. Feeders and branch circuits 8 AWG and smaller: copper, solid conductor, 600 volt insulation.
- F. Feeders and branch circuits larger than 8 AWG: copper, stranded conductor, 600 volt insulation.
- G. Pull ungrounded and ground conductors into a raceway at the same time. Use UL listed wire pulling lubricant for pulling 4 AWG and larger wires.
- H. Building wire and power cable testing shall be made by means of an insulation testing device such as "Megger" using not less than 500 volts dc test potential.

### 3.8 WIRING DEVICES

- A. Wiring devices shall be rated for 20a minimum, unless noted otherwise.
- B. Ground fault circuit interrupter (GFCI) devices shall comply with the latest edition of UL 943.
- C. Install nameplate identification to junction boxes and coverplates. Identification shall identify panel name and circuit number.
- D. Install steel coverplates in unfinished areas.
- E. Test receptacles for proper polarity, ground continuity and compliance requirements.

### 3.9 SURGE PROTECTION DEVICES (SPD)

- A. The SPD shall provide transient voltage suppression, surge current diversion and high frequency noise attenuation, when connected in parallel to the facilities distribution system. The unit MCOV shall not be less than 115% of the nominal system voltage. Operating frequency shall be for a 60 Hz system. The unit shall provide protection in all normal modes for "wye" and "delta" systems. The short circuit current rating shall be the larger of the listed value on the drawings or as required by the equipment protected.
- B. Warranty: ten (10) years. Includes manufacturer's forensic diagnostic and SPD replacement. Installation by others.
- C. The unit shall be installed as close as practical to the panel in accordance with applicable national/local electrical codes and the manufacturer's recommended installation instructions. Connect the unit to the panelboard using a conduit nipple. Flush mount the unit in the front of the panelboard. Mount unit directly across from the breaker or disconnect serving it.
- D. The surge protection unit shall be isolated from the electrical distribution system via 3 pole circuit breaker mounted in the panelboard or be equipped with a factory supplied integral fused switch or circuit breaker.

- E. Check unit to ensure all MOVs for each mode of protection are operational. Verify integral fuse links are operational and have not melted.
- F. Surge suppression devices shall not be installed ahead of the main service disconnect(s).
- G. Install fuses in all fuse holders and fused disconnects internal to the surge protection unit. Use fuses recommended by the manufacturer to satisfy repetitive UL 1449 operation of the surge suppression unit. External fusing of the surge protection device is not allowed.
- H. Coordinate location of surge protection device to allow adequate clearances for maintenance.
- I. The surge protection manufacturer's technician shall perform a system startup in the field to assure proper installation, operation and initiate the warranty of the system.
- J. SPD manufacturer shall be the same as the panelboard manufacturer.

### 3.10 IDENTIFICATION OF ELECTRICAL ITEMS

- A. Provide permanent identification markings and nameplates for wiring of each piece of electrical equipment (nameplates, tape labels, wire markers, conduit labeling, conduit labeling, conductor color labeling, electrical gear labeling, transformers, motor controllers), electrical coverplates (switches, receptacles, information technology outlets), grounding, HVAC control, with the same inscriptions as shown on the drawings. Clearly and neatly applied engraved plastic laminate, white background with black text, 1-1/4" x 3" minimum as manufactured by Brady B-499 polyamide coated nylon cloth labels with acrylic pressure sensitive adhesive.
- B. Wire labels shall be made using a label printer such as the Brady ID Pal labeling tool, Brady Worldwide Inc., Milwaukee, WI or approved equal using a minimum 10 point font.
- C. Provide a typewritten directory of circuits in panelboards. Provide panel identification in black alkyd paint stenciled inscriptions on the inside of the door. Include the room names and items served on the cards.
- D. Panelboards shall have each overcurrent protection device identified with name and location of the load being served ("SP-1: P480-21" located in Vault").
- E. Identify junction, pull and connection boxes with system voltage, and circuits on outside of box cover using permanent magic marker (color coded) neatly hand printed.
- F. Apply warning, caution and instruction signs where required by NEC to assure safe operation and maintenance of electrical systems and of the items to which they connect.



- G. Install arc flash warning signs on all panelboards, industrial control panels, and motor controllers.
- H. 208Y/120 volt, 4-wire conductors shall be color coded as follows: A-phase (black); B-phase (red); C-phase (blue); neutral (white); ground bond (green).
- I. 480Y/277 volt, 4-wire conductors shall be color coded as follows: A-phase (brown); B-phase (orange); C-phase (yellow); neutral (gray); ground bond (green).
- J. A separate nameplate for the service entrance equipment shall be labeled with the maximum available fault current and date of calculation given on the riser diagram.

### 3.11 ELECTRICAL CONTROL PANEL

Control panel shall be in a NEMA 1 enclosure located inside of the building as shown on the drawings. All controls, switchgear, pump controls, lighting panel, convenience outlets and necessary ventilation to prevent overheating in summer and a thermostatically-controlled heater to provide heat in the winter shall be provided in the building. The building shall also house the main service disconnect, power distribution equipment and automatic telephone dialer is located as shown on the drawings. All software and programming shall be provided by Lake County Public Works.

LCPW Standard Controller Parts List			
Qty	Catalog Number	Manufacture	Description
1	1769-L93ER	Allen Bradley	CompactLogix 5370 L9 Controller
1	1769-PA4	Allen Bradley	CompactLogix I/O Power Supply
1	1769-IA8 or IA16	Allen Bradley	Digital Input Module
1	1769-OA8 or OA16	Allen Bradley	Digital Output Module
1	1769-IF4 or IF8	Allen Bradley	Analog 4/8 CH Input Module
1	1769-OF4 or OF8C	Allen Bradley	Analog 4/8 CH Output Module
1	1769-ECR	Allen Bradley	Right End Cap
1	2711F-T6C20D	Allen Bradley	FV Plus, 6" Color Touch
	or		
1	2711F-T10C4DS	Allen Bradley	FV Plus, 10" Color Touch
3	905-Series	Allen Bradley	Nema Full Voltage Reversing, w/592 E1 Plus Solid-State Overload Relays
3	599-TC9N Series	Allen Bradley	Terminal and Lug Covers
3	599-P99 Series	Allen Bradley	Protective Covers
12	1484R-N2 Series	Allen Bradley	Lug Connectors, Size 3
1	SPIDER 5TX	Hirschmann	Ethernet Hub 5 Port
1	MDS 1NET 900	MDS	900 HL Spread Spectrum NCVR
	Depends on area		
1	MDS 1NET-II 900	MDS	900 HL Spread Spectrum NCVR

PANEL			
1	CSD488812		Concept Wall Mount Enclosure
1	TEP61		Fan
1	TEP6		Exhaust
1	ADP2	Hoffman	Data Pocket
1	ADSTOPK		Door stop
1	CMHNL		Non-locking Handle
1	CMFK		Mounting Bracket Kit
1	CP4836	Hoffman	Panel
1	A266010NPLP		Two Door Wall Mount Type-12
2	APWR2919NF	Hoffman	Window Kits
4	AVK84		Louver Plate Kit
1	A60P06	Hoffman	Panel
1	A60P90	Hoffman	Panel to Mount Drives
1	TEP101SS	Hoffman	Fan Package
1	TEP10SS	Hoffman	Exhaust Package
1	ATE200	Hoffman	Temperature Control Switch
1	E1PB	Hoffman	1 Pushbutton Enclosure
11	8501NP12P14V20	Square D	120 VAC Relay
11	8501NR52	Square D	8 Pin Relay Block
2	8501NR51	Square D	8 Pin Relay Block
1	8501M2040	Square D	AC Master Relay for Chlorine Pump
1	9001SBR1U	Square D	Push Button
1	9001KN199HP	Square D	Legend Plates, BACK-UP PUSHBUTTON
1	9001KA1	Square D	Contact Block
1	HALD09	Square D	22mm PE Enclosure
2	2BSAD28	Square D	22mm Toggle Switch Maintained
2	2BSA2101	Square D	22mm Contact Block w/1 NO Contact
2	2BY2216	Square D	22mm Legend Plates, HAMB
2	GB2CB06	Square D	1A, 1P, Motor OT Circuit
1	9080LEA268106	Square D	Power Distribution Block

1	9080LEA962104	Square D	Power Distribution Block
1	9080LE23	Square D	Protective Cover
1	9080LC23	Square D	Protective Cover
100	9080GP6	Square D	Wire Terminals
50	9080GP6B	Square D	End Caps
100	9080GM35	Square D	End Clamps
1	581F	Square D	10KVA Transformer
1	H265M	Square D	400A, 600VAC, Fused Disconnect
2	H265M	Square D	400A, 600VAC, Disconnect
6	A6D 225 R	Ferraz Shawmut	225A, 600V Time Delay Fuses
2	1182-5	Erickson Electric	400A Meter Trim
1	750814D4E010.000 000.000E10070A	Pressure Systems	MPXI 750, 4-20ma transducer, 0-10psi, 70ft cable, w/surge
2	HVM040A1-4A1E1	Cutler-Hammer	CH VFD, 480VAC input, 40 HP
2	HMCP100R9C	Eaton	Motor Circuit Protectors, Series C,F Frame
1	FAZ-C4/1	Eaton	2A, 1P, Fan 1/2 Power
1	FAZ-C6/1	Eaton	6A, 1P, Flow Meter Power
1	FAZ-C10/1	Eaton	10A, 1P, Enclosure Lights
1	FAZ-C16/1	Eaton	16A, 1P, Control Power
2	FAZ-C20/1	Eaton	20A, 1P, Maintenance Receptacle
1	FAZ-C22/2	Eaton	22A, 1P, Chlorine Power Panel
1	FAZ-D20/2	Eaton	20A, 2P, Transformer Primary, 1f 480
1	FAZ-C2/3	Eaton	2A, 3P, Phase Monitor
2	FAZ-C10/3	Eaton	10A, 3P, Heater
1		Zenith	Zenith Automatic Transfer Switch Open Transition (OTG), Microprocessor, Utility to Utility Transfer, 260 A, 3 Poles, Enclosure Type 1 277/480 VAC 3 Phase/4 Wire 60 Hz * Additional Standard Features, MENEG * Provide with the following options, DS
1	SDN 5-24-100P	SOLA	120VAC/24VDC Power Supply
1	STV25K-108	SOLA	120VAC, 20A, Surge Suppressor
1	MUX-05-41	Q Mark	50W 480 VAC Heater
1	MBE-10	Q Mark	Mounting Bracket

2	TF115	Sunne	Thermostat
1	APM-120-ACE	Diversified Electronics	Automatic Timing Controls
2	SPM-120-ABA-100K	Diversified Electronics	Dual Seal Fail Detector
1	A257B	Time Mark	480VAC, 3 Phase Monitor
1	HBL1221TL	Hubbell	Light Switch
1	Gray	Hubbell	Light Switch Cover
1	8899-GY	Leviton	GCFI
1	30429	Mulberry	GCFI Cover
1	30213	Mulberry	2x4 Box
1	30248	Mulberry	4x4 box
5	VT4-232DR-UNU-ER61-WL-U	Cooper Lights	Enclosure Lights

A. Lift Station Control Panel Electrical Components shall include the following. Unless otherwise noted, no substitutions are permitted:

1. All components in the lift station control panel shall be UL approved.
2. All starters, breakers and contactors shall be Allen Bradley.
3. The storm water pumping station shall be provided with an Allen Bradley Micrologix 1500 PLC with memory and real time clock module including 5 meter RS232 Operating/Programming cable.
4. A Panelview Plus 600 Color Touchscreen 27111P-T6C20D terminal. The Panelview shall be provided with a blank external 32 MB compact flash card and external compact flash card to PCMCIA adapter.
5. The Micrologix and Panelview Software and Programming will be provided by Lake County Public Works.
6. Pump run timers shall be Cramer.
7. Phase monitors shall be (Ottal 8 pin plug in type) Diversified Electronics or Time Mark.
8. Power supply and power protection and conditioning shall be SOLA Hevi-duty DIN Rail Series.
9. All relays shall be manufactured by Potter Brownfield or Square D tubular terminal Type KP.
10. Pump seal failure shall be monitored by Time Mark Dual Seal Failure protector.
11. Terminal strips shall have a minimum of 50% unused terminal capacity.
12. A battery backup shall be provided to power instrumentation and telemetry for a minimum 8-hour period following power failure. The battery shall be lithium ion,

nickel metal hydride or other technology that does not require periodic conditioning to maintain full capacity.

13. Dialer shall be Sensaphone model FGD-0400.
14. Sensors and appropriate Micrologix interface modules shall be provided to monitor the following parameters:
  - Pump called for (each pump)
  - Wet well level
  - Generator called for
  - Generator run time
  - Pump run (each pump)
  - Pump run time (each pump)
  - Generator run
  - Phase monitoring
15. The following alarms shall be provided:
  - Pump shaft seal failure (each pump)
  - Pump failure (each pump)
  - Telemetry failure
  - Generator fail
  - Power failure
  - Unauthorized entry
  - High water level
  - Common
16. All alarms shall be annunciated through the Micrologix controller. All controls shall conform the Lake County Public Works Standards. The control program and alarms status programming shall be as standardized by LCPW personnel.

### 3.12 VARIABLE FREQUENCY DRIVE

- A. Variable Frequency Motor Drive (VFD) shall consisting of a pulse width modulated (PWM) inverter designed for use on a standard NEMA Design B induction motor. The manufacturer shall have been engaged in the production of this type of equipment for a minimum of ten years.
- B. Referenced Standards
  1. Underwriters Laboratories UL508C, National Electrical Manufacturer's Association (NEMA), ICS 7.0, AC Adjustable Speed Drives IEC 16800 Parts 1 and 2.
- C. Qualifications
  1. VFDs and options shall be UL listed as a complete assembly.
- D. Construction
  1. The variable frequency drives (VFDs) shall be solid state, with a Pulse Width Modulated (PWM) output. The VFD package as specified herein shall be enclosed in a NEMA 1 enclosure, completely assembled and tested by the manufacturer. The VFD shall employ a full wave rectifier (to prevent input line notching), Integral Line Reactor(s), Capacitors, and Insulated Gate Bipolar Transistors (IGBT's) as the output switching device. The drive efficiency shall be

97% or better at full speed and full load. Fundamental power factor shall be 0.98 at all speeds and loads.

2. Input 480 VAC  $\pm$  10%, 3 phase, 48-63 Hz
3. Environmental operating conditions: 0 to 40C, 0 to 3300 feet above sea level, less than 95% humidity, non-condensing.
4. Enclosure shall be rated NEMA-1.

E. Standard Features:

1. All VFDs shall have the same customer interface, including digital display and keypad, regardless of horsepower rating. The keypad is to be used for local control, for setting all parameters, and for stepping through the displays and menus. The keypad shall be removable, capable of remote mounting, and shall have it's own non-volatile memory. The keypad shall allow for uploading and downloading of parameter settings as an aid for start-up of multiple VFDs.
2. The keypad shall include Hand-Off-Auto membrane selections. When in "Hand" the VFD will be started and the speed will be controlled from the up/down arrows. When in "Off", the VFD will be stopped. When in "Auto" the VFD will start via an external contact closure and the VFD speed will be controlled via an external speed reference. The drive shall incorporate "bumpless transfer" of speed reference when switching between "Auto" and "Hand" modes. The VFD shall have the ability to automatically restart after an overcurrent, overvoltage, undervoltage, or loss of input signal protective trip, the number of restart attempts, trial time, and time between reset attempts shall be programmable.
3. The VFD shall be capable of starting into a rotating load (forward or reverse) and accelerate or decelerate to setpoint without safety tripping or component damage (flying start).
4. The VFD shall be equipped with an automatic extended control power loss ride-through circuit, which will utilize the inertia of the load to keep the drive powered. Minimum power loss ride-through shall be one cycle, based on full load and no inertia. Removing power from the motor is not an acceptable method of increasing power loss ride-through.
5. If the input reference (4-20mA or 2-10V) is lost, the VFD shall give the user the option of either (1) stopping and displaying a fault, (2) running at a programmable preset speed, or (3) hold the VFD speed based on the last good reference received. Loss of reference shall cause a warning to be issued, as selected by the user. The drive shall be programmable to signal this condition via a keypad warning, relay output and/or over the serial communication bus.
6. The customer terminal strip shall be isolated form the line and ground.
7. The drive shall employ current limit circuits to provide trip free operation:
  - a. The Slow Current Regulation limit circuits shall be adjustable to 150% (minimum) of the VFD's normal duty current rating. This adjustment shall be made via the keypad, and shall be displayed in actual amps, and not as percent of full load.
8. The Current Switch-off limit shall be fixed at 350% (minimum, instantaneous) of the VFD's normal duty current rating.
9. The overload rating of the drive shall be 110% of its normal duty current rating for 1 minute in every 10 minutes.

10. The VFD shall have an integral Line Reator(s) to reduce the harmonics to the power line and to increase the fundamental power factor.

F. Adjustments

1. Two (2) programmable critical frequency lockout ranges to prevent the VFD from operating the load continuously at an unstable speed.
2. Two (2) programmable analog inputs shall accept a current or voltage signal for speed reference or for reference and actual (feedback) signals. Analog inputs shall include a filter; programmable from 0.01 to 10 seconds to remove any oscillation in the input signal. The minimum and maximum values (gain and offset) shall be adjustable within the range of 0 - 20 ma and 0 - 10 Volts. Additionally, the reference must be able to be scaled so that maximum reference can represent a frequency less than 60 Hz, without lowering the drive maximum frequency below 60 Hz.
3. Five (5) programmable digital inputs for maximum flexibility in interfacing with external devices. One digital input is to be utilized as a customer safety connection point for fire, freeze, and smoke interlocks (Enable). Upon remote, customer reset (reclosure of interlock) drive is to resume normal operation.
4. One (1) programmable analog output proportional to Frequency, Motor Speed, Output Voltage, Output Current, Motor Torque, Motor Power (kW), DC Bus voltage, Active Reference, and other data.
5. Two (2) programmable digital relay outputs. The relay shall be rated for maximum switching current 8 amps at 24 VDC and 0.4 at 250 VAC; Maximum voltage 300 VDC and 250 VAC; Continuous current rating 2 amps RMS. Outputs shall be true form C type contacts; open collector outputs are not acceptable. Relays shall be capable of programmable on and off delay times.
6. Seven (7) programmable preset speeds.
7. Two independently adjustable accelerate and decelerate ramps. These ramp times shall be adjustable from 1 to 1800 seconds.
8. The following operating information displays shall be standard on the VFD digital display. All applicable operating values shall be capable of being displayed in engineering (user) units. A minimum of two operating values from the list below shall be capable of being displayed at all times. The display shall be in complete English words (alpha-numeric codes are not acceptable):
  - Output Frequency
  - Motor Speed (Rpm, %, or Engineering Units)
  - Motor Current
  - Calculated Motor Torque
  - Calculated Motor Power (Kw)
  - DC Bus Voltage
  - Output Voltage
  - Heatsink Temperature (F)
  - Analog Input Values
  - Analog Output Value
  - Keypad Reference Values
  - Elapsed Time Meter (Resettable)
  - Kwh Meter (Resettable)
  - Mwh Meter



- Digital Input Status
  - Digital Output Status
9. The VFD shall have the following protection circuits. In the case of a protective trip, the drive shall stop, and annunciate the fault condition in complete words (alphanumeric codes are not acceptable).
- a. Overcurrent trip 350% instantaneous (170% RMS) of the VFD's variable torque current rating
  - b. Overvoltage trip 130% of the VFD's rated voltage
  - c. Undervoltage trip 65% of the VFD's rated voltage
  - d. Overtemperature + 90C
  - e. Ground Fault either running or at start
  - f. Adaptable Electronic Motor Overload ( $I^2t$ ). The Electronic Motor Overload protection shall protect the motor based on speed, load curve, and external fan parameter. Circuits, which are not speed dependant, are unacceptable. The Electronic Motor Overload protection shall be UL listed for this function.
- G. Speed Command Input
- 1. Keypad
  - 2. Two Analog inputs, each capable of accepting a 0-20mA, 4-20mA, 0-10V, 2-10V
- H. Start-up
- 1. Certified factory start-up shall be provided for each drive by a factory authorized service center. A certified start-up form shall be filled out for each drive with a copy provided to the owner, and a copy kept on file at the manufacturer.
- I. Contactor Bypass
- 1. (Microprocessor based Bypass Controller) - Manual or automatic (selectable) transfer to line power via contactors. A keypad to control the bypass controller is to be mounted on the enclosure door. The bypass keypad shall include a one line diagram and status LEDs to indicate the mode of operation and "external Fault" conditions. When in the "Normal" mode, the bypass contactor is open and the drive output contactor is closed. In the "Test" position, both contactors are open. In the "Bypass" position, the drive output contactor is open, and the bypass contactor is closed. Start/stop via customer supplied maintained contact shall be 24V or 115V compatible and shall function in both the "Normal" and "Bypass" modes. The VFD shall be equipped with AC line disconnect contactors. The contactor circuit shall be designed to disconnect the AC power source to the VFD during extended periods of pump/drive inactivity.
  - 2. Door / cover interlocked disconnect switch which will disconnect all input power from the drive and all internally mounted options. The disconnect handle shall be through the door, and be padlockable in the "Off" position.
  - 3. Fast acting semi-conductor fuses exclusive to the VFD - fast acting semi-conductor fuses allow the VFD to disconnect from the line prior to clearing upstream branch circuit protection, maintaining bypass capability. Bypass designs which have no such fuses, or that incorporate fuses common to both the VFD and the bypass will not be accepted. In such designs, a fuse clearing failure would render the bypass unusable. Class 10 electronic motor overload

protection shall be included in the microprocessor bypass to protect the motor in bypass mode.

4. copy kept on file at the manufacturer.

J. Acceptable Manufacturer: Cutler-Hammer.

### 3.13 TELEMETRY, SCADA & RADIO/ANTENNA TOWER

J. An alarm dialer shall be used to contact Lake County Public Works during alarm conditions. The dialer shall be capable of reporting alarms using any combination of voice and tone signaling over radio or telephone systems, alarm inputs and control relay outputs, fully programmable - local or dial-up with user programmable messages.

K. The telephone dialer shall be a model FGD-0400 Sensaphone dialer.

L. The SCADA (supervisory control and data acquisition) system provided must meet LCPW requirements and approval. The system shall consist of the following components:

1. Hapco 55' tower with concrete foundation and grounding.
2. Conduit from radio tower to the pump station control panel shall be 2" galvanized rigid conduit non-coated or painted and installed 12" deep.
3. The wiring shall be 1/2" 50 ohm LMR 600 coaxial cable from Times Microwave Systems stock code 54003, with connectors manufactured by RF Industries, LTD part number RFN-1006-2L2.
4. Lightning arrestor, N/F part number 15632.
5. The antennas shall be Laird Technologies yagi antennas part number Y8966.
6. Radio, Ethernet bridge, 900MHz spread spectrum part number INETII-EBDN.
7. This Contractor shall verify Telemetry, SCADA & Radio/Antenna Tower equipment with the Owner's Information Technology representative prior to bid/purchase/installation. See 1.4.B for more information. This is especially prudent with the associated Technology scope of work.

### 3.14 STAND-BY GENERATOR

#### A. GENERAL

1. The stand-by generator system shall be UL2200 and prototype tested, factory built, production tested, site tested, and incorporate the latest features in commercial design. The equipment supplied shall meet the requirements of the National Electric Code, along with all applicable local codes and regulations.

#### B. EQUIPMENT

1. The pump company shall furnish a stand-by generator set, model GS125G6SRA as manufactured by MTU (basis of design), Kohler, Caterpillar or Generac. The unit shall consist of the components listed below, be new and of current production, all assembled and tested as a complete unit by the set manufacturer. The unit shall be rated 125 KW, 156.25 KVA, and output shall be 480Y/277 volts connected for 3 phase, 4 wire, 60 hertz, at .8 power factor. The generator shall be indoor, open unit on a reinforced concrete pad.

C. FUEL

1. The unit shall be natural gas-powered.

D. ENGINE

1. The engine shall be 10 cylinder, 6.8 L, liquid cooled with v-belt driven water pump circulating 50/50 glycol/water coolant through a radiator with pusher fan system. Engine shall be equipped with remote-controlled positive engaging electric starter system. Positive pressure oiling lubrication system with oil filter, injectors, or carburetor for specified fuel, battery recharging alternator with automatic static voltage regulator, cooling thermostat; an electronic isochronous governor with maximum drop not to exceed 25% at full load. In addition, engine will be equipped with high temperature, low oil pressure; low coolant and over-speed safety shutdowns latch off until manually reset. A dry type air cleaner shall be furnished.

E. EXHAUST

1. The exhaust system shall include a critical type muffler sized so that back-pressure does not exceed the engine manufacturer's recommendation when installed.

F. GENERATOR

1. There shall be provided a salient-pole, revolving field, open drip-proof, synchronous, alternating current generator with brushless exciter and static automatic silicon controlled rectifier voltage regulator, with minimum adjustment rate of +/- 1%. Unit shall be of single bearing construction, directly connected to the engine in accordance with SAE. The stator and the armature shall be laminated silicon steel, and all windings shall be vacuum impregnated with Class F insulation. The units shall have a centrifugal blower to force air through the generator, which is to operate at 105 degrees centigrade continuous rated temperature rise. Insulation shall be Class F. Temperature rise shall not exceed NEMA MG1-22.40 at the standby rating. Generator unit shall be of the three phase, 12 lead broad range re-connectable type and shall have a transient overload capacity of 300% of rated KVA at low power factor for motor starting. Voltage change shall not exceed 12% or 3% Maximum Harmonic Content on application or removal of full load with two-cycle recovery. Maximum voltage variation shall not exceed plus or minus 1% and a PMG shall be included.

G. UNIT MOUNTING & ACCESSORIES

1. Unit mounted radiator ambient capacity of 50 degree C/122 degree F shall be assembled and mounted on a steel frame base of rigid construction. The base shall include a unit mounted battery rack, complete with one battery for 12 volts operation rated at 925 Cold Cranking Amps. A unit mounted vibration isolated control box including equipment for voltage regulation and engine control, field excitation protection; over-cranking protection; terminal board for remote control connections; oil pressure gauge; coolant temperature gauge; static regulated battery charging alternator with battery charging ammeter; safety shutdown for low oil pressure and high coolant temperature, low coolant level, over-speed with failure indicators; an output junction box for power connections; voltmeter; ammeter and meter transfer switch, frequency meter, hour meter and a local/off remote switch shall be furnished. In addition, the unit manufacturer shall provide

properly sized vibration isolators for placement between the base and engine/generator.

2. In addition to the above operation specifications, the system shall be equipped with the following accessories.
  - a. Automatic cycle cranking to allow 3 fifteen second cranking cycles with fifteen seconds rest periods between cranking attempts. Cranking shall lock out and light an indicator after 3 attempts. It shall reset automatically if engine starts or manually if engine does not start after 3 attempts. No thermal devices will be permitted.
  - b. Exerciser timer with load/no load switch with minimum operation of 30 minutes once per week.
  - c. Regulated constant voltage static temperature compensated battery charger rated 12 amps minimum D.C., charging ammeter and voltmeter; battery charger shall taper to trickle for fully charged battery, and shall be automatically disconnected from the battery during cranking.
  - d. Breaker – 225 Amp mounted/wired in a NEMA 1 Enclosure.

#### H. CONTROLLER

1. A set-mounted controller capable of facing right, left, or rear shall be vibration isolated on the generator enclosure. The controller shall be capable of being remote mounted. The micro-processor control board shall be moisture proof and capable of operation from -40 degrees C to 85 degrees C. Relays will only be acceptable in high-current circuits. Circuitry shall be capable of plug-in design for quick replacement. Controller shall be equipped to accept a plug-in device capable of allowing maintenance personnel to test controller performance without operating the engine. The controller shall include:
  - a. Fused DC circuit
  - b. Complete two-wire start/stop control, which shall operate on closure of a remote contact.
  - c. Speed sensing and a second independent starter motor disengagement systems shall protect against starter engagement with a moving flywheel. Battery charging alternator voltage will not be acceptable for this purpose.
  - d. The starting system shall be designed for restarting in the event of a false engine start, by permitting the engine to completely stop and then re-engage the starter.
  - e. Cranking cyler with 15 second ON and OFF cranking periods.
  - f. Over-crank protection designed to open the cranking circuit after 75 seconds if the engine fails to start.
  - g. Circuitry to shut down the engine when signals for high coolant temperature, low coolant level, low oil pressure, or over-speed are received.
  - h. Engine cool down timer factory set at 5 minutes to permit unloaded running of the standby set after transfer of the load to normal.
  - i. Three (3) position (Automatic - OFF - TEST) selector switch. In the TEST position, the engine shall start and run regardless of the position of the remote starting contact. In the Automatic position, the engine shall start when contacts in the remote control circuit close and stop 5 minutes after those contacts open. In the OFF position, the engine shall not start even though the remote start contacts close. This position shall also provide for

immediate shutdown in case of an emergency. Reset of any faults shall also be accomplished by putting the switch to the OFF position.

- j. Indicating lights to signal:
- k. Test button for indicating lights.
- l. Alarm Horn with silencer switch per NFPA 110.
- m. Terminals shall be provided for each signal (see above), plus terminals for common fault and common pre-alarm. Dry contacts for Generator Run and Generator Fail signals need to be included in the generator control panel.

I. DIGITAL INSTRUMENT PANEL:

- 1. An instrument panel shall include:
  - a. Dual range voltmeter 3-1/2" inch, +/- 2% accuracy
  - b. Dual range ammeter 3-1/2" inch, +/- 2% accuracy
  - c. Voltmeter - ammeter phase selector switch.
  - d. Lights to indicate high or low meter scale.
  - e. Direct reading pointer-type frequency meter 3-1/2", 0.5% accuracy, 45 to 65 Hz scale.
  - f. Panel illuminating lights.
  - g. Battery charging voltmeter.
  - h. Coolant temperature gauge.
  - i. Oil pressure gauge.
  - j. Running time meter.
  - k. Voltage adjust rheostat.
- 2. Installed Accessories Shall Include:
  - Silencer:  Industrial  Residential  Critical
  - Tail Pipe & Rain Cap
  - Flexible Exhaust
  - Duct Adapter Flange
  - Block Heater: 1800-watts, single-phase
  - Flex Fuel Lines
  - Fuel System:  Solenoid Valve  Dry Fuel Strainer
  - Electronic Governor
  - Breaker:  Safeguard  Molded Case Line
  - Common Failure Relay
  - Battery & Rack
  - Battery Charger
  - Oil Drain Extension
  - 5 year warranty from the date of equipment start-up**
  - Fuel Regulator  Primary  Secondary (complete with proper isolation valves)
  - Remote Emergency Break Glass Stop Button
  - Automatic Transfer Switch NEMA-1 (mounted inside the building)
- 3. The automatic transfer switch shall have a "hard-wired" interlock with the main disconnect.

3.15 PREFABRICATED PUMP STATION BUILDING

A. ELECTRICAL CONDUIT AND WIRING

1. Contractor shall provide complete electrical conduit and wiring in accordance with the applicable requirements of NEC and local codes. The Contractor shall electrically connect and wire all electrical equipment for a complete and operating installation.
- B. RECEPTACLES
1. 20 amp GFI duplex receptacles for 120 volt service.
  2. Approved manufacturer: Leviton.
- C. INTERIOR AND EXTERIOR BUILDING LIGHTING
1. Interior lighting shall be fluorescent strip fixtures, each with two lamps, tube wire-guards, and -20 degree ballasts. Fixtures shall be arranged for ceiling or pendant mounting, firmly affixed to ceiling with proper regard for headroom/clearance and located to adequately light each side of the generator set and the control equipment. A switch shall be provided adjacent to the entry door. Emergency lighting and Exterior building lighting shall be as shown on the Drawings. Exterior fixtures shall be controlled by a roof mounted photocell controlled with toggle switch override on inside of building.
  2. Generator & Electrical rooms interior lighting approved manufacturer: Cooper Lighting # VT3 232DR UNV ER81-WL-U.
- D. RELATED ACCESSORIES
1. Electrical Incoming utility service shall be furnished and installed by Contractor in accordance with ComEd requirements and City codes as shown on Drawings.
  2. Technology Incoming utility service shall be furnished and installed by Contractor in accordance with the Technology utility company requirements and City codes as shown on Drawings.
  3. Main Disconnect furnished and installed as shown on Drawings.
  4. Surge Protective Devices furnished and installed as shown on Drawings.
  5. Lighting Panel / Distribution Panel furnished and installed as shown on Drawings.
  6. Variable Frequency Drives furnished and installed as shown on Drawings.
  7. Carbon Monoxide Detectors furnished and installed as shown on Drawings.
  8. Low Voltage Transformer furnished and installed as shown on Drawings.
  9. Standby generator and generator accessories furnished and installed as shown on Drawings.
  10. Automatic Transfer Switch furnished and installed as shown on Drawings.
  11. Pump Control Panels furnished per the specifications and as shown on the drawings.
  12. Technology equipment furnished per the specifications and as shown on the drawings.
  13. Lake County Public Works Standard Controller Parts List furnished as included in this specification.

### 3.16 TESTING

- A. ELECTRICAL CONDUIT AND WIRING
1. Prior to shipment, the generator set manufacturer shall set up and test the generator and shall certify that the unit has performed satisfactorily at full rated load

at .8 power factor. Prior to start-up of the unit all fluids and lubricants for the generator must be provided and verified by the manufacturer's start-up agent.

B. ON-SITE LOAD BANK TESTING

1. After all engine-generator equipment has been installed; provide a portable load bank test using the services of a manufacturer's representative to perform the following:
  - a. Connect the engine-generator set to the load bank and conduct a 4-hour test which varies the load on the generator from 10 % to 100 % to determine that the voltage, frequency, capacity, fuel, combustion air, cooling, and ventilation systems are adequate.
    - 1) Include a 10% load for 15 minutes, a 25 % load for 15 minutes, a 50 % load for 15 minutes, a 75 % load for 15 minutes, and a 100 % load for up to 3 hours.
    - 2) Apply each load increment in single steps.
2. Provide a comprehensive demonstration to the Owner of the system maintenance and operation after the load bank test and after the engine-generator set is electrically connected to the automatic transfer switch.
  - a. Include a minimum of 3 simulated power failures in the presence of the transfer switch manufacturer's representative.

C. Measurement and Payment

1. Payment will be made as a lump sum unit price for Pay Item X0783300 PUMP STATION ELECTRICAL WORK.

**X0783500 PUMP STATION MECHANICAL WORK**

1.1 GENERAL

- A. Furnish and install a triplex submersible pump system as shown on the drawings and described herein. System shall include three submersible pumps and one jockey pump, with metal-to-metal (MTM) style sealing flanges, pump mounting plates, discharge elbow, upper and lower guide rail supports, carrier assembly, pump lifting chains with hooks, access frame with covers wiring bracket, NEMA 1 control panel enclosure, variable frequency drives, float switches and submersible level transducer for level control. Structure and dimensions shall be as shown on the drawings.

1.2 DIESEL GENERATOR HOUSE

1. For related specifications, see Pump House Complete, Pump Station General Work and Pump Station Electrical Work Specifications.

2. INSULATION - DIESEL EXHAUST

- a. Provide insulation for entire length of diesel generator exhaust, including muffler (silencer). Insulation material shall be calcium silicate (ASTM C533) with flame spread/smoke developed rating of 0/0 when tested in accordance with ASTM E84. Material shall have an R-factor of .67 at a mean temperature of 700°F. Provide insulation to maintain man-safe exterior surface temperature. Provide minimum thickness of 3" installed in three 1" layers with offset seams. Provide stainless steel bands on inner layer. Provide aluminum cladding secured with stainless steel bands on outer layer.

1.3 WET WELL AND VALVE VAULT

A. GENERAL

1. Discharge piping from pump bases shall be mounted in the basin and extended through the basin wall. Provide rubber boots or "Link-Seals" on all piping penetrations through the concrete walls.

B. PIPING

1. Piping in the basin shall be ductile iron pipe conforming to ANSI 21.15 as shown on the drawings and shall terminate with a flange outside the basin wall for connection to the valves in the external valve vault. Inlets into basin shall be as shown on the drawings for inlet pipe complete with a rubber boot. The pump guide rails shall be 3 inch stainless steel, schedule 40 pipe as shown on the drawings. Intermediate guide rail supports shall be provided at intervals of not more than 15 feet.



### C. METAL-TO-METAL GUIDE RAIL SYSTEM

1. The MTM rail system shall include a discharge base elbow, sealing flange with rail guide, upper guide bracket, stainless steel lifting chain, and stainless steel guide rails.
2. The discharge base elbow shall be mounted directly on the sump floor and sized according to the drawings. It shall have a standard 125 lb flange, with machined face. The design shall be such that the pump to discharge connection is made without the need for any nuts, bolts, or gaskets. The base elbow shall also anchor two (2) 3" stainless steel guide rails.
3. A sealing flange/rail guide bracket shall be mounted on each pump discharge. It shall have a machined mating flange matching the base elbow discharge connection. Sealing of this discharge connection shall be accomplished by simple linear downward motion of the pump culminating with the entire weight of the pumping unit supported entirely by the base elbow.
4. The upper guide bracket shall align and support the two guide rails at the top of the sump. It shall bolt directly to the hatch frame and incorporate an expandable rubber grommet. Each pump shall be provided with a stainless steel lifting chain of sufficient length to extend from the pump to the top of the wet well. The access frame shall provide a hook for storage of the chain when not in use. The lifting chain shall be sized according to the pump weight.

### D. NATURAL GAS PIPING

1. Provide piping for natural gas in sizes shown. Piping shall be schedule ASTM A53 40 black steel pipe, with ASTM A197 threaded malleable iron fittings for pipe 2-1/2" and smaller. Pipe 3" and larger shall have welded joints using fittings of same material as pipe. Welding shall be done by AWS qualified welders; each weld shall be identified by welding mark.

### E. WIRING BRACKET

1. Provide a stainless steel wiring bracket to provide cord grip holders for the pump sensor cords and the float control cords. All cords shall extend from bracket through conduit to control/junction box. Continuous cords must be used from pumps to the junction box and/or controls. Wiring bracket shall be fastened to access frame. Coordinate with Lake County Public Works supplied mounting brackets.

## 1.4 SUBMERSIBLE PUMPS

### A. GENERAL

1. Stormwater pumps: Each pump shall be of the submersible type Wilo Model No. FA 25.74E, KSB Model No. K200-315/196XG-S, or ASB (Sulzer) Model No. XFP 80C 201G. The pumps shall be constructed with single channel type impellers.

Pump shall have two mechanical seals with an oil chamber between the seals. Rotating seal faces shall be carbon and stationary seal faces shall be ceramic. Pump motor shall be of the sealed submersible type with standard insulation for operation in high-dielectric oil to give better heat dissipation and longer bearing life. Motor stator shall be held in place with a removable end ring so that it can be removed for repair without heating outer shell or using a press. Motor housing shall be filled with high-dielectric oil and no pressure balancing devices shall be used. Pump motor shaft shall be of type 303 stainless steel. Pump shall be a standard production pump of the manufacturer with attached rail guides and discharge sealing flanges. All lifting loads will be imposed on the guide supports and not on the pump or motor housing. A stainless steel lifting chain and hook shall be supplied for each pump. Each pump motor will be provided with heat sensing units, which shall trip the starter if the motor overheats. Seal chamber of each pump shall be fitted with an electrode probe to detect water in the seal chamber.

#### B. POWER CORD

1. The power cable entry into the cord cap assembly shall first be made with a compression fitting. Each individual lead shall be stripped down to bare wire, at staggered intervals, and each strand shall be individually separated. This area of the cord cap shall then be fitted with an epoxy compound potting which will prevent water entry even in the event of wicking or capillary attraction. There shall be an additional epoxy compound potting area separating the motor housing from the cord cap assembly for added protection. Each power and sensor cord shall be designed for flexibility and serviceability under conditions of "extra hard usage" and shall meet the requirements of the NEC for flexible cords in sewage pump stations.
2. All electrical components shall conform to NEC requirements for Class I, Div. I, Group D, hazardous locations.

#### C. OPERATING CONDITIONS—Initial Flows

1. Each pump shall be rated for a present capacity of 2675 gpm. at a total dynamic head of 25 feet. The pump motor shall be sized to meet the duty condition, and shall be 30.5 HP, 3 phase, 460 volts, 60 Hz. The motors shall be non-overloading across the entire pump performance curve.

#### D. ELECTRICAL CONTROL PANEL

1. Refer to Electrical Specifications.

#### E. INSTRUMENTATION

1. SUBMERSIBLE LEVEL TRANSDUCER (PRIMARY CONTROL)
  - a. The transducer shall be a submersible solid state instrument designed to continuously translate sensed level to an electric signal for system control. The sensing element shall be of the strain gauge type using a piezoresistive

silicon chip with an integral wheatstone bridge circuit. The unit shall be housed in a sealed 316 stainless steel housing. Transducer shall meet or exceed the following requirements:

- b. Accuracy:  $\pm 1\%$  (of full transducer span)
- c. Temperature drift:  $\pm 3\%$  (of full transducer span)
- d. Operating temp. Range:  $-54^{\circ}\text{C}$  to  $+121^{\circ}\text{C}$

2. FLOAT SWITCH (BACK-UP SYSTEM)

3. Sealed float type mechanical switches shall be supplied to back-up the level transducer in the event of a failure. Mechanical float bell level system shall be provided with an integrated duplex controller. The mechanical tube switches shall be sealed in a solid polyurethane float for corrosion and shock resistance. The support wire shall have heavy neoprene jacket and a weight shall be attached to the cord above the float to hold switch in place in sump. The weight shall be above the float to prevent sharp bends in the cord when the float operates under water. The float switches shall hang in the sump supported only by the cord that is held to the wiring channel. Four (4) float switches shall be used to control level. One for pump turn-on and high water alarm, and one for pump turn-off, and one for both pumps turn-on. The automatic transfer switch shall be the standard product of a manufacturer regularly engaged in the production of the specified item.

4. LEVEL CONTROL MOUNTING SYSTEM

- a. Furnish a stainless steel level control mounting system including 3/16" stainless steel chain, and clevis to mount all level controls. This system is designed to keep the level controls from tangling and out of the influent stream. The level control cables shall be fastened to the chain using "ty-raps" to prevent the cables from slipping. This system shall be mounted as shown on the drawing.

5. OPERATION OF SYSTEM

- a. Lead start shall rotate among the three pumps, A, B and C. On sump level rise, the pressure shall energize and start the lead pump. With lead pump operating sump level shall lower until the "off level" is reached, thereby de-energizing the lead pump. Alternating relay shall index on stopping of pump so that the most recent lead pump shall become the third pump and the next pump in rotation will become the lead pump on next operation. If sump level continues to rise when lead pump is operating, the second pump shall start upon reaching the override. Both pumps shall operate together until the "off level" is reached. If level continues to rise with two pumps operating, the third pump shall start upon reaching the override. All three pumps shall operate together until the "off level" is reached. If the level continues to rise and the high level is reached, the high level alarm shall be activated. On failure of any one pump for any reason, the next pump in the sequence shall operate on the override control. All levels shall be adjustable, through the programmable level controller located in the control panel.
- b. If the level control system should fail, the float back-up system shall be activated based on the tipping of the high water float. Operation of the float

back-up system shall be as described in the above paragraph, and shall continue until the system is manually reset by the operator.

6. DEWATERING PUMP AND CONTROLLER

- a. A separate pump control panel shall be included within the controls enclosure. The single pump controller shall be in a NEMA 1 enclosure and with operators thru the door. The panel shall be for manual pump down operation only with automatic low water shut down feature. The control panel shall include the circuit breaker, contactor, overload, hand and off switch for manual operation. The pump control panel shall operate the 230 volt, 1 phase pump as required. The pump shall be rated for 100 GPM @ 25' TDH, 2" discharge. Provide submersible pump by same manufacturer as main pumps.

7. HEATING AND VENTILATION

- a. Provide exhaust fan, 12" with gravity shutter, including galvanized sheet metal canopy with insect screen. Fan shall be direct drive, with aluminum blades, steel hub, wire guard and minimum 14 gauge steel mounting panel. Fan shall provide 1,000 CFM @ .125" s.p.. Motor shall be 120v, 1 phase, 1/12 HP. Provide wall collar and mounting hardware.
- b. Provide 5KW, 480v, 3 phase wall mounted electric unit heater with integral thermostat and trip-over switch including mounting channel, outlet and brackets. Unit heater shall have completely enclosed fan motor, aluminum fin, copper clad steel element sheath, and steel housing with adjustable discharge louvers. Provide unit mounted control transformer if required.

8. LOUVERS AND DAMPERS

- a. Stationary louvers in combination with motorized dampers complete with motor operator shall be provided with the pre-cast concrete building. Louvers/dampers shall be as required for engine-generator intake and discharge of combustion and cooling air. The louvers shall have storm proof blades. Both intake and discharge dampers shall be motor operated and equipped with insect screens. Louvers/dampers shall have an anodized aluminum finish. Louvers and dampers shall be sized to provide adequate air flow to the fully loaded generator set, limit restriction of the air flow as required by the generator set manufacturer, and to minimize the chance of water ingestion with excessive air flows. Minimum sizes of louvers/dampers are shown on the drawings and contractor shall coordinate and verify adequacy of size. The motor operators for dampers shall be 120 vac, two position, electrically powered closed, spring-powered open. Operators shall be installed to "fail safe" and permit air-flow through the louvers under power loss conditions.

9. OPENINGS & PENETRATIONS

- a. Various openings and penetrations are required in the building exterior panels to accommodate features (other than doors) such as louvers, fans and vents. Such openings shall be provided by the pre-fabrication manufacturer. No openings shall be cut in the prefabricated structure at the site unless specifically approved by the pre-fabrication manufacturer (in

writing) and the Owner's Representative.

10. EQUIPMENT RESPONSIBILITY

11. All controls, pumps, and motors shall be furnished by one equipment supplier. The equipment supplier shall have responsibility for the complete and proper operation of the new and existing pumping equipment, control equipment, and programming as specified and furnished. The system supplier shall furnish 24 hour service for the complete system, and shall stock all parts used in the installation. Start-up services shall be included, and shall include operating instruction for the operators. The equipment shall be as manufactured and furnished by a certified pump company regularly engaged in the production of equipment of the specified type.

F. SHOP DRAWINGS

1. The contractor shall submit installation and coordination drawings to the engineer and Lake County Public Works for approval. Reviewed copies will be returned to the contractor with appropriate action taken. Full size electronic copies in PDF format transmitted by e-mail are preferred. Alternatively, the contractor may provide six full-size copies at 1/4" minimum scale on bond paper.
2. Each set of shop drawings shall include, but not necessarily be limited to:
  - a. Drawings showing dimensions of all equipment. Control details and electrical schematic diagrams. Performance data including, when applicable, pump curves, and motor data.
  - b. All other information necessary to enable the engineer to determine whether the proposed equipment meets the requirements.

G. INSTALLATION AND OPERATING INSTRUCTIONS

1. Two (2) copies of a manual, containing installation instructions, operating instructions, wiring diagrams, parts list, and, where applicable, test data and curves shall be provided. Operation and maintenance manuals shall be on 8-1/2" x 11" paper, bound in 3-ring binder and covered by clear acetate covers.
2. The contractor shall provide the services of factory-trained representative for a maximum period of one (1) day to start up the station and to instruct the client's operating personnel in the operation and maintenance of the equipment provided.

H. WARRANTY

1. The manufacturer shall warrant his product to be free from defects for a period of one (1) year from date of completion.
2. In the event a component fails to perform as specified or is proven defective in service during the warranty period, excluding items of supply normally expended during operation, the manufacturer shall provide a replacement part without cost to the Owner.

3. This warranty shall be valid only if the product is installed, serviced, and operated under normal conditions, in accordance with the manufacturer's instructions.

I. EQUIPMENT MANUFACTURER

1. In order to establish a standard of quality and to insure a uniform basis of bidding, pump station equipment shall be supplied by a certified pump company or a written approved equal.
2. The contractor shall prepare his bid on the basis of the specified equipment and materials for purposed of determining the low bid.
3. After the execution of the contract, substitution of equipment by other manufacturers may be considered, if the substitution is, in the opinion of the engineer, equal in quality and performance to that named. If such substitution is approved by the engineer, the contractor shall bear responsibility for any changes to other systems required to support the alternate submitted and approved equipment. In submitting for substitution, the contractor shall provide certified copies of itemized equipment proposals from the proposed manufacturer.

J. Measurement and Payment

1. Payment will be made as a lump sum unit price for Pay Item X0783500 PUMP STATION MECHANICAL WORK.

**X6026050 SANITARY MANHOLES TO BE ADJUSTED**

Description. This work shall consist of adjusting sanitary manholes to final grade. Sanitary manholes to be adjusted shall be fitted with an external chimney seal as indicated in the plan details. Existing chimney seals may be adjusted and reused if considered suitable for reuse by the Engineer. This work shall otherwise be performed in accordance with the applicable portions of Section 602.

Access to the sanitary manholes must be provided to LCPW during construction and at all times.

*The frame shall not protrude more than 1½" above the pavement surface at any time during the milling/resurfacing process. This will require more than one adjustment in areas where the milling exceeds 1½".*

*As an option, the Contractor may remove the frame and grate/lid and place a plate over the structure until the binder course is placed. The plate shall then be removed and the frame and grate/lid installed at the final grade prior to the placement of the surface course.*

*As an alternative to the temporary hot-mix asphalt ramp placement required by Article 603.07 of the "Standard Specifications", the Contractor may use a manhole safety ramp. The ramp shall be a compression-molded composite of 100% recycled rubber. The ramp shall have a minimum height of 2".*

<b>Characteristics</b>	<b>Specification</b>	<b>Standard</b>
Density	0.6 oz/cu in	ASTM C 642
Durometer Hardness	65A	ASTM D 2240
Tension Strength	300 PSI	ASTM D 412
Elongation	90%	ASTM D 412
Brittleness	-40° F	ASTM D 746
Coefficient of Thermal Expansion	$8 \times 10^{-5}$	ASTM C 531

*The manhole safety ramp shall fit securely around the structure frame, and shall remain properly installed during use.*

Basis of Payment. This work will be paid for at the contract unit price per each for SANITARY MANHOLES TO BE ADJUSTED, which price shall include new chimney seals where required.

**X6026051 SANITARY MANHOLES TO BE RECONSTRUCTED**

Description. This work shall consist of reconstructing sanitary manholes. Sanitary manholes to be reconstructed shall be fitted with an external chimney seal as indicated in the plan details. Existing chimney seals may be adjusted and reused if considered suitable for reuse by the Engineer. This work shall otherwise be performed in accordance with the applicable portions of Section 602.

Access to the sanitary manholes must be provided to LCPW during construction and at all times.

*The frame shall not protrude more than 1½" above the pavement surface at any time during the milling/resurfacing process. This will require more than one adjustment in areas where the milling exceeds 1½".*

*As an option, the Contractor may remove the frame and grate/lid and place a plate over the structure until the binder course is placed. The plate shall then be removed and the frame and grate/lid installed at the final grade prior to the placement of the surface course.*

*As an alternative to the temporary hot-mix asphalt ramp placement required by Article 603.07 of the "Standard Specifications", the Contractor may use a manhole safety ramp. The ramp shall be a compression-molded composite of 100% recycled rubber. The ramp shall have a minimum height of 2".*

<b>Characteristics</b>	<b>Specification</b>	<b>Standard</b>
Density	0.6 oz/cu in	ASTM C 642
Durometer Hardness	65A	ASTM D 2240
Tension Strength	300 PSI	ASTM D 412
Elongation	90%	ASTM D 412
Brittleness	-40° F	ASTM D 746
Coefficient of Thermal Expansion	8 x 10 <sup>-5</sup>	ASTM C 531

*The manhole safety ramp shall fit securely around the structure frame, and shall remain properly installed during use.*

Basis of Payment. This work will be paid for at the contract unit price per each for SANITARY MANHOLES TO BE RECONSTRUCTED, which price shall include new chimney seals where required.



**X6026054 SANITARY MANHOLES TO BE REMOVED**

Description. This work shall consist of the removal of existing sanitary manholes at the locations shown on the plans and as directed by the Engineer. All work shall conform to Section 605.

Basis of Payment. This work shall be paid for at the contract unit price each for SANITARY MANHOLES TO BE REMOVED, regardless of size.

**XX003358 SANITARY MANHOLE, 5' DIA**

Description. This work consists of constructing new sanitary manholes where shown on the plans or specified by the Engineer as indicated on the LCPW "Standard Manhole Detail" included in the plans. Access shall be provided at all times to LCPW during construction. Adjustments are to be made as necessary during all stages of construction.

Basis of Payment. This work shall be paid for at the contract unit price per each for SANITARY MANHOLE, of the diameter specified; which price shall include the frame and grate or frame and lid specified.

**Z0047400 PUMP HOUSE COMPLETE**

PART 1 – GENERAL

1.01 SUMMARY

This work included the design, submittals, furnishing and installation of a pre-cast concrete control building complete including roof. Building elements shall be per the general requirements of the drawings regarding dimension, aesthetics, finishes and openings. Finishes for the pre-cast concrete shall be included in this work. The control building shall include a complete system including walls, doors, hardware, drainage, roof and support system, gutters, downspouts and splash blocks, and foundation anchors.

1.02 REQUIREMENTS

- A. ACI-318-02, "Building Code Requirements for Reinforced Concrete". Concrete Reinforcing Institute, "Manual of Standard Practice".
- B. ANSI/ASCE-7-02 "Building Code Requirement for Minimum Design Loads in Buildings and Other Structures".
- C. IBC 2012, 1996 BOCA
- D. Concrete Reinforcing Institute, "Manual of Standard Practice".
- E. Insulation: Building shall be insulated to R28

1.03 SUBMITTALS

The contractor shall submit design calculations and shop drawings to the Engineer and Lake County Public Works for approval prior to construction. Design calculations and shop drawings shall be signed and performed by an Illinois Licensed Structural Engineer. Shop drawings shall include plan, elevation, and details showing overall pattern, joint locations, openings, accessories, end locations and other special conditions. Submittals shall be in accordance with the general specifications.

Contractor shall coordinate all requirements of the building to accommodate electrical and mechanical components.

The Contractor shall provide a mockup built thirty (30) days prior to commencing work, using same materials, methods and work force that will be used for the project, of sufficient size and detail to demonstrate the completed fit, finish, and color of the work. Engineer will determine specific requirements and location, and whether mockup shall be incorporated as a part of the final project. Include an area to demonstrate the final product.

## PART 2 – PRODUCTS

### 2.01 MATERIALS

- A. Pre-Cast Concrete: Class PC Concrete per Article 1020.04 (c.) of the Standard Specifications
- B. Reinforcing Steel: ASTM A615, grade 60 unless per the Standard Specifications.
- C. Formliners: Formliner material shall comply with the requirements of Section 50300285 FORMLINER TEXTURED SURFACE.
- D. Caulking: Joints shall be caulked on the exterior and interior surface. Caulking shall be an elastic sealant exterior grade. Exterior caulk joint to be 3/8" x 3/8" square so that sides of joint are parallel for correct caulk adhesion. Back of joint to be taped with bond breaking tape to ensure adhesion of caulk to parallel sides of joint and not the back.
- E. Vents: Screened aluminum vents to be cast in wall panels..
- F. Panel Connections: Panels shall be securely fastened together with 3/8" thick steel brackets. Steel is to be of structural quality, hot-rolled carbon complying with ASTM A283, Grade C and hot dipped galvanized after fabrication. All fasteners to be 1/2" diameter bolts complying with ASTM A307 for low-carbon steel bolts. Cast-in anchors used for panel connections to be galvanized steel casting panels.
- G. Coatings: Shall comply with the requirements of Section X5030290 STAINING CONCRETE and Section X0321865 ANTI-GRAFFITI PROTECTION SYSTEM.

### 2.02 ACCESSORIES

- A. Doors and Frames: Shall comply with Steel Door Institute "Recommended Specifications for Standard Steel Doors and Frames" (SDI-100) and as herein specified. The building shall be equipped with 18-gauge galvanized/insulated metal doors with 16-gauge galvanized frames. Doors and frames shall be painted one coat of rust inhibitive primer and one finish coat of enamel paint; color shall coordinate with the Stained Concrete and be subject to approval of the Engineer.
- B. Door Hardware:
  - 1. Handle: stainless steel, 8-1/2" x 2".
  - 2. Hinges: 4 1/2" x 4 1/2" (chrome-plated with non-removable hinge pins), 3 per door or equal.
  - 3. Lock Set: stainless steel finish.
  - 4. Threshold: raised interior, extruded aluminum threshold with neoprene seal.

## 2.03 METAL ROOF

Design, detail, furnish and install roofing panels, halters, fasteners, flashing, closures, insulation, and related accessories including gutters and downspouts as required for a complete roofing system.

### 1. Design Requirements

- a. The standing seam roof system shall be designed to safely resist the positive and negative loads as required for the location and project.
- b. Structural-uniform uplift load capacity of the panel system shall be determined in accordance with the principles of ASTM E1592, "Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference" as follows:
  1. The Factor of Safety on the test results shall be 1.65 for the panel and clip/halter ultimate loads with no increase for wind.
  2. The Factor of Safety for fasteners shall be 3.0 for single fastener in each connection, 2.25 for 2 or more fasteners in each connection and 4.0 in masonry.
  3. Design uplift capacity for condition of gage, span or loading other than those tested may be determined by interpolation of test results.
- c. Deflection shall be  $l/180$  for positive loading.
- d. Water penetration of the panel assembly at 20psf pressure for 15 minutes shall have "no uncontrollable leakage" when tested in accordance with ASTM E331.
- e. Air infiltration of panel assembly at 20psf pressure shall be no more than 0.02 cfm/sf of panel when tested in accordance with ASTM E283.
- f. The panel system shall have a U.L. Class 90 rating.
- g. The panel system shall have a Factory Manual approval per research standard 4471 meeting a (minimum) class 01-90, 0 1-105, 0 1-120, 0 1-180.
- h. Fasten the roofing panels to the structure through the use of concealed halters/clips which are designed to allow for all panel movement through a temperature differential of 180°F without impeding the performance of the panel.

### 2. Materials

- a. Metal Panels

1. Fabricate metal panels from a minimum of 0.040" thick aluminum, 0.050" thick aluminum alloy 3004-H-14 clad, or 0 22 gage (0.030"), 020 gage (0.036") gage G-90 Galvanized steel conforming to ASTM A653 structural quality Grade 33, Grade A and ASTM A792, Grade 50B with an AZ50 coating when coil coated or AZ55 when used bare.
2. Panels shall be a maximum of 0 12" wide (305 mm), or 0 16" wide (400 mm) with a vertical standing leg height of 2 1/2 ".

b. Concealed Clips

1. Fasten standing seam roofing to structure with specially designed and tested clips/halters manufactured exclusively for the roofing system.
2. Clips/halters must be designed to allow the roofing materials free movement in either direction parallel to the standing leg of the panel.

c. Finish

1. Exterior Surface of Panels: Consisting of nominal 0.2 mil primer and nominal 0.8 mil 70% polyvinylidene topcoat. The color shall be approved by the engineer and shall coordinate with the concrete stain. Roof color shall match "Fern Green" as identified by A-Lent Roof Systems.
  - a. The coating system must have been tested to and exhibited the minimum characteristics of the following ASTM test criteria
    - i. Specular Gloss (ASTM D-523 @ 60 degrees), Standard gloss of 20-30.
    - ii. Pencil Hardness (ASTM D-3363), HB-H
    - iii. Flexibility, T-Bend (ASTM D-4145), No cracking or tape removal of film at 1-T on painted aluminum and at 2-T on paint steel.
    - iv. Adhesion/Reverse Impact (ASTM D-3359, D-2794), 1.5 times metal thickness with no loss of adhesion. No cracking or loss of adhesion.

- v. Abrasion/Falling Sand, (ASTM D-968),  
Liters to expose 5/32" of substrate-50.
  - vi. Acid Pollutants, (ASTM D-1308) 10%  
muriatic acid (15 min) no effect, 20%  
sulfuric acid (15 min) no effect.
  - vii. Salt Spray Resistance 5% @ 95 degrees F  
(ASTM B-117). Passes 3,000 hrs on alum.  
And 1,000 hrs on coated steel.
  - viii. Humidity Resistance 100% @ 95 degrees F  
(ASTM D-2247). Passes 3,000 hrs on  
alum. And 1,000 hrs on coated steel.
  - ix. Weathering Tests (ASTM D-2244, D-822  
Color Retention, D-659 Chalk Resistance),  
Less than 5NBS units change, Passes  
5,000 hrs, Rating of 8 min.
- 2. Flashing- All trim materials to be same gage and finish as  
specified for the panel system.
  - 3. Continuous applied weather seal shall be installed during  
the manufacturing process of the panel system.

## 2.04 FINISHES

Building finish shall be per the plan drawings subject to the material requirements contained herein.

## PART 3 – EXECUTION

- A. Building shall bear fully on a concrete foundation. Anchorages to the concrete foundation are included with the building system. Contractor shall coordinate the placement of building anchors with the concrete foundation.
- B. Contractor shall coordinate any attachments or openings required by mechanical and electrical components.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.01 PAYMENT

The cost of furnishing and installation of a pre-cast concrete control building complete as specified herein shall be paid for as the lump sum contract unit price for PUMP HOUSE COMPLETE.

**Z0057400 SANITARY SEWER 21”**

Description. This work consists of constructing new sanitary sewers where shown on the plans or specified by the Engineer. The sanitary sewer material shall be PVC and comply with LCPW specifications.

Basis of Payment. This work shall be paid for at the contract unit price per foot for SANITARY SEWER 21”; which price shall include connecting to sanitary lift stations or manholes.

Where required by Article 208.01 of the Standard Specifications, trench backfill will be paid for according to Article 208.04.



## **CLCJAWA SPECIAL PROVISIONS**

### **56103000 DUCTILE IRON WATER MAIN 6"**

**Description:** This work will consist of furnishing all labor, materials, equipment and incidentals required to install, disinfect and test ductile iron pipe and fittings for piping as shown on the Drawings and as specified herein.

Piping shall be located substantially as shown on the Drawings. The Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference between pipes or for other reasons. Pipe fitting notation is for the Contractor's convenience and does not relieve him/her from installing and jointing different or additional items where required to achieve a complete piping system.

Where the word "pipe" is used it shall refer to pipe, fittings, or appurtenances unless otherwise noted.

**Materials:** The materials shall be as shown in the Drawings and as specified herein.

#### *DUCTILE IRON PIPE*

Ductile iron pipe shall conform to AWWA C151. The pipe shall be Class 350 as per AWWA C151, with nominal wall thickness required for design conditions. Pipe shall be supplied in standard lengths as much as possible. Pipe and fittings shall be supplied by the following:

1. American Cast Iron Pipe Company
2. Clow Water Systems Company
3. US Pipe and Foundry Company

Ductile iron pipe shall have a minimum tensile strength of 60,000 psi with minimum yield strength of 42,000 psi (per AWWA M-41). Design shall be done for external and internal pressures separately using the larger of the two for the net design thickness. Additional allowances shall be made for service allowance and casting tolerance per AWWA C150.

Design for the net thickness for external loading shall be taken as the greater of the following conditions:

1. 2-1/2-ft of cover with AASHTO H-20 wheel loads, with an impact factor of 1.5.
2. Depth from future proposed grade (whichever is greater) to top of pipe as shown on the Drawings, with truck load.
3. Soil Density: 120 lbs/cu ft
4. Laying Conditions; AWWA C150, Type 4

Design for the net thickness shall be based upon the following internal pressure conditions:

1. Design pressure: 150 psi
2. Surge allowance: 100 psi
3. Safety factor: 2
4. Total internal pressure design:  $2 ([150] + [100]) = 500$  psi
5. E': 300 psi

Copies of design calculations showing that the pipe meets all of the requirements specified herein shall be furnished to the Engineer for approval during shop drawing review. A yield strength of 42,000 psi shall be used during design calculations.

#### *END TREATMENTS/JOINTS*

Ductile iron pipe and fitting joints shall be push on rubber gasket, locking ring type restrained joints per the manufacturer's standard. All gasket materials shall comply with Table 5-1 of AWWA M-41.

Restraint for push on joint pipe shall be positive locking "Locked-type" joints manufactured by the pipe and fitting manufacturer that utilize restraint independent of the joint gasket. All restrained joints shall be suitable for a 250 psig working pressure. Joints shall be fabricated of heavy section ductile iron casting. Restrained push on joints shall be by one of the following:

1. Lok Ring as manufactured by the American Cast Iron Pipe Company
2. Super-Lock as manufactured by Clow Water Systems Company
3. TR FLEX as manufactured by US Pipe and Foundry Company

Connections to existing ductile iron pipe and other connections requiring mechanical joints shall be restrained mechanical joints or solid sleeves assembled in strict accordance with manufacturer's instructions, AWWA C600 and AWWA C111. Retainer glands shall be MEGALUG, Series 1100, as manufactured by EBAA Iron.

#### *FITTINGS*

Pipe fittings shall be ductile iron with pressure rating of 350 psi for 24-in and smaller piping. Fittings shall meet the requirements of AWWA C110 or AWWA C153 as applicable. Fittings shall have the same pressure rating, as a minimum, of the connecting pipe.

Closures shall be made with mechanical joint ductile iron solid sleeves and shall be located in straight runs of pipe at minimum cover outside the limits of restrained joint sections. Location of closures shall be subject to approval of the Engineer

### *INTERIOR LINING*

Ductile iron pipe and fittings shall have double thickness cement lining in accordance with AWWA C104.

### *EXTERIOR COATING*

Ductile iron pipe and fittings shall be installed with a bituminous coating in accordance with AWWA C151 and C110 respectively.

Ductile iron pipe and fittings shall be installed with a polyethylene encasement. Polyethylene encasement shall have a minimum thickness of 8 mils or exceed the minimum standards established by AWWA C105. Polyethylene encasement shall be supplied by the following:

1. North Town Company
2. AA Thread and Seal Tape
3. Sigma Corporation

A 2-inch wide plastic adhesive tape, such as Calpico Vinyl, Polyken, or U.P.C. Tape, shall be used for sealing seams, cuts, or tears in polyethylene encasement. Duct tape shall not be allowed.

### *DIELECTRIC INSULATING FLANGE GASKET KITS*

Dielectric insulating flange gaskets kits for ductile iron pipe shall be installed where shown on the Drawings. In general, flange insulation kits shall be installed where a ductile iron flange is mated with flanges constructed of bronze alloys, steel alloys, 300 Series stainless steel alloys, 90-10 copper-nickel alloys (Monel), or nickel alloys (Hastelloy) flanges; where process piping mates with valves and other equipment and appurtenances of dissimilar metals furnished under Sections in Division 11 and 15; where exposed piping makes a vertical transitions to buried piping; and where otherwise shown on the Drawings.

Insulating flange gaskets shall be furnished as a kit including the dielectric gasket, bolt sleeves and washers in accordance to the nominal flange size.

Each dielectric insulating gasket shall be a full faced isolating and sealing gasket, Type "E", 1/8" thick, epoxy-glass retainer with bolt holes cut to match ANSI B16.1 drilling. The retainer shall contain a precision tapered groove to accommodate the controlled compression of a FKM (Viton) sealing element. The quad-ring seal shall be pressure energized. The epoxy-glass retainer shall have 550-volts/mil dielectric strength and a minimum 50,000-psi compressive strength.

Insulating bolt sleeves shall be manufactured of Mylar having a dielectric strength of not less than 4000-volts/mil.

Insulating washers shall be manufactured of G-10 epoxy-glass having a dielectric strength of 400 to 500-volts/mil. Insulating washers shall be installed with metallic backing washers to

prevent damage to the epoxy-glass washer during bolting. The metallic washers shall be constructed of the same material as the bolts.

The Contractor may use molded sleeve washers as an alternate to separate washers and sleeves, as long as the material of construction has equivalent properties to those above.

Bolts shall be torque according to the gasket manufacturer requirements for the diameter and pressure rating of the pipe.

Dielectric insulating flange gasket kits shall be one of the following:

1. Linebacker manufactured by Pipeline Seal and Insulator, Inc, Houston Texas;
2. Trojan Quad Seal manufactured by Advance Products and Systems, Lafayette, Louisiana;
3. Jock O-ring gaskets manufactured by Central Plastics Shawnee, Oklahoma.

#### *ELECTRICAL CONTINUITY BONDING*

Provide electrical continuity bonding for all ductile iron pipe include bonding across push on joint assemblies and mechanical joint assemblies. Two bond cables shall be used across each joint.

Electrical bond wires shall be a minimum No.2 AWG seven strand copper cable furnished with high molecular weight polyethylene insulation (HMWPE). One to 1-1/2 inches of HMWPE insulation shall be removed from each end of all bond cables. To achieve more flexibility in the bond cables THHN/THWN insulation will be acceptable.

**General:** This work shall be performed according to Section 561 of the "Standard Specifications" and the following:

- A. American Society for Testing and Materials (ASTM)
  1. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications
  2. ASTM A194 - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service.
  3. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
  4. ASTM A674 - Standard Practice for Polyethylene Encasement for Ductile Iron Pipe for Water or Other Liquids
  5. ASTM C150 - Standard Specification for Portland Cement
  6. ASTM D1248 - Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable

- B. American Water Works Association (AWWA)
1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
  2. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems
  3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3-in through 48-in (75mm Through 1219mm) for Water
  4. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
  5. AWWA C115 – Flanged Ductile Iron Pipe With Ductile Iron or Grey Iron Threaded Flanges.
  6. AWWA C150 - Thickness Design of Ductile-Iron Pipe
  7. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast, for Water
  8. AWWA C153 - Ductile- Iron Compact Fittings, 3-in through 24-in and 54-in through 64-in, for Water.
  9. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
  10. AWWA C651 - Disinfecting Water Mains
  11. AWWA M41 - Ductile Iron Pipe and Fittings Manual of Water Supply Practices
- C. National Sanitation Foundation (NSF)
1. NSF 61 - Drinking Water System Components Health Effects
- D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

### *SUBMITTALS*

Submit copies of design calculations in accordance with Paragraph 2.02 below.

Submit a tabulated laying schedule which references stations and invert elevations as shown on the Drawings as well as all fittings, bends, outlets, restrained joints, tees, special deflection bells, adapters, solid sleeves and specials, along with the manufacturer's drawings and specifications indicating complete details of all items. The laying schedule shall show pipe class, class coding, station limits and transition stations for various pipe classes. The above shall be submitted to the Engineer for approval before manufacture and shipment. The location of all pipes shall conform to the locations indicated on the Drawings. Pipe shall not be supplied from inventory.

Submit anticipated production and delivery schedule.

Prior to shipment of pipe, submit a certified affidavit of compliance from the manufacturer stating that the pipe, fittings, gaskets, linings and exterior coatings for this project have been manufactured and tested in accordance with AWWA and ASTM standards and requirements specified herein.

### *QUALITY ASSURANCE*

Each length of ductile iron pipe supplied for the project shall be hydrostatically tested at the point of manufacture to 500 psi for a duration of 10 seconds per AWWA C151. Testing may be performed prior to machining bell and spigot. Failure of ductile iron pipe shall be defined as any rupture of the pipe wall. Certified test results shall be furnished in duplicate to the Engineer prior to time of shipment.

All ductile-iron pipe and fittings to be installed under this project shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. Furnish in duplicate to the Engineer sworn certificates of such tests and their results prior to the shipment of the pipe.

All pipe and fittings to be installed under this Contract may be inspected at the plant for compliance with these Specifications by an independent testing laboratory selected by the CLCJAWA.

Inspection of the pipe and fittings will also be made by the Engineer or representative of the CLCJAWA after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the Specification requirements, even though sample pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the job.

All pipe and fittings shall be permanently marked with the following information:

1. Manufacturer, date
2. Size, type, class, or wall thickness
3. Standard produced to (ANSI/AWWA, ASTM, etc)

### *DELIVERY, STORAGE AND HANDLING*

Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe. Under no circumstances shall the pipe be dropped or skidded against each other. Slings, hooks, or pipe tongs shall be used in pipe handling.

Materials, if stored, shall be kept safe from damage. The interior of all pipe, fittings and other appurtenances shall be kept free from dirt or foreign matter at all times.

Pipe shall not be stacked higher than the limits recommended by its manufacturer. The bottom tier shall be kept off the ground on timbers, rails, or concrete. Pipe in tiers shall be alternated. At least two rows of 4-in by 4-in timbers shall be placed between tiers and chocks affixed to each end in order to prevent movement.

Gaskets for mechanical and push-on joints to be stored shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.

**Installation:** This work shall be performed according to Section 561 of the "Standard Specifications" and the following:

#### *INSPECTION OF EXISTING PIPE*

The Contractor shall make available the existing water main removed for inspection. The Contractor shall coordinate with CLCJAWA staff as to when the pipe will be available and not dispose of it until such inspection has been completed.

#### *INSTALLING DUCTILE IRON PIPE AND FITTINGS*

Ductile iron pipe and fittings shall be installed in accordance with requirements of AWWA C600, except as otherwise specified herein. If any defective pipe or fitting is discovered after it has been laid, it shall be removed and replaced with a sound pipe or fitting in a satisfactory manner by the Contractor, at his/her own expense.

All pipe and fittings shall be kept clean until they are used in the work and shall be sound and thoroughly cleaned before laying. When laid, the pipe and fittings shall perform to the lines and grades required as well as at a continuous uniform slope between fixed points or constraints. When laying is not in progress, including lunch breaks, open ends of the pipe shall be closed by a watertight plug or other approved means. Sufficient backfill shall be placed to prevent flotation. The deflection at joints shall not exceed that recommended by the manufacturer.

All ductile iron pipe laid underground shall have a minimum of 5-ft of cover unless otherwise shown on the Drawings or as specified herein. Pipe shall be laid such that the invert elevations shown on the Drawings are not exceeded.

Fittings, in addition to those shown on the Drawings shall be provided, where required, in crossing utilities which may be encountered upon opening the trench. Solid sleeve closures shall be installed at locations approved by the Engineer.

When field cutting the pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. The end of the cut pipe shall be beveled to conform to the manufacture's recommendations for the spigot end. Any coating removed from the cut end shall be repaired according to manufacturer's recommendation. Cement lining shall be undamaged. Cutting of restrained joint pipe will not be allowed, unless approved at specific joints in conjunction with the use of restrainer glands or field adaptable restrained joints. Where field cuts are permitted, the pipe to be cut shall be supplied by the factory as "gauged full length". Should full length gauged pipe be unavailable, the pipe to be cut shall be field gauged at the location of the new spigot using a measuring tape, or other means approved by the manufacturer, to verify that the diameter is within the tolerances permitted in Table 1 of AWWA C151.

### *JOINTING DUCTILE IRON PIPE AND FITTINGS*

Mechanical joints shall be assembled in strict accordance with the manufacturer's instructions and AWWA C600. Pipe shall be laid with bell ends looking ahead. To assemble the joints in the field, thoroughly clean and lubricate the joint surfaces and rubber gasket. Bolts shall be tightened to the specified torques. Under no condition shall extension wrenches or pipe over handle of ordinary ratchet wrench be used to secure greater leverage.

Restrained joints shall be installed according to pipe manufacturer's instructions.

Bolts in mechanical or restrained joints shall be tightened alternately and evenly.

All bolts and hardware for buried pipe shall be Type 316 SS.

### *ELECTRICAL CONTINUITY BONDING*

All below grade mechanical joints shall be made electrically continuous by thermite brazing a bond cable across each joint as specified herein.

Thermite brazing techniques shall comply with the manufacturer's recommendations. Only proper size cartridges and welders shall be permitted. Prior to brazing, an area of piping three inches square shall be cleaned to bright metal with a grinder. The slag shall be removed from the completed braze with a hammer. The adequacy of each braze shall be demonstrated by gently striking the connection with a hammer. The cleaned piping surface, including the brazed connection and any exposed copper wire, shall be coated with a cold applied tar compound recommended by the pipe manufacturer.

**Hydrostatic Tests:** This work shall be performed according to Article 561.04 of the "Standard Specifications" and the following:

After installation, cleaning and disinfection, the pipe shall be tested for compliance. Furnish all necessary equipment and labor for the pressure test and leakage test on the pipelines.

Submit detailed test procedures and method for Engineer's review. In general, testing shall be conducted in accordance with AWWA C600

Duration of pressure test shall not be less than 2 hours. All leaks evident at the surface shall be repaired and leakage eliminated regardless of the total leakage as shown by test. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are complied with. Defective materials, pipes, valves and accessories shall be removed and replaced.

**Disinfection of Water Main:** This work shall be performed by the Contractor in accordance to Article 561.05 of the "Standard Specifications" with following exceptions:

Chlorination of the pipeline shall be required in accordance to Section 4.7.4 of AWWA C651 and arranged by the Contractor. Chlorine gas direct injection into the pipe is not permitted.

Discharge of chlorinated water shall comply with all Federal, State and local standards. Provide sodium bisulfite for dechlorination prior to discharge.



Operation of CLCJAWA isolation valves, blow-off hydrants, and air release valves for dewatering and flushing shall be restricted to CLCJAWA staff. The Contractor shall provide 48 hour notification to CLCJAWA prior to operation of any of CLCJAWA isolation valves, blow-off hydrants, and air release valves.

Bacteriological samples shall be taken by CLCJAWA staff upon completion of work.

**Method of Measurement:** Water main will be measured for payment in place in feet.

**Basis of Payment:** This work will be paid according to Article 561.07 of the "Standard Specifications" at the contract unit price per foot for DUCTILE IRON WATER MAIN 6". The unit price for DUCTILE IRON WATER MAIN 6" is to include demolition of existing pipe, fittings, installation and testing.

**56105780 BUTTERFLY VALVES 20"**

**Description:** This work will consist of furnishing all labor, materials, equipment and incidentals required and provide all valves located in vaults and appurtenances with actuator as shown on the Drawings and as specified herein.

**Materials:** The materials shall be as shown in the Drawings and as specified herein.

*BUTTERFLY VALVES*

Valves shall be manufactured in strict accordance with AWWA C504. Valves shall be bubble tight at rated pressures. Valve discs shall rotate 90 degrees from full closed to open. Operators shall be assembled to the valve by the valve manufacturer. The valve/operator shall be tested as a complete assembly by the valve manufacturer. The manufacturer shall have produced AWWA butterfly valves for a minimum of 5 years.

Valve bodies shall be constructed of cast iron ASTM A126, Class B. Valves in vaults shall be flanged. Flange drilling shall be in accordance with ANSI B16.1, Class 150. Laying length shall be short body as listed in AWWA C504.

Valve discs shall be constructed of cast iron ASTM A126 or A48, ductile iron ASTM A536. Material mating with the seat shall be either ni-chrome, Type 304 or Type 316 stainless steel.

Rubber valve seats shall be Buna-N. If the seat is on the disc it shall be mechanically retained by Type 304 stainless steel fasteners. If the seat is in the valve body and seat retaining hardware such as screws and segments are used they shall be monel. If screws are used, monel plugs shall be affixed in the valve body and tapped to receive these screws.

Valve shafts shall be Type 304 stainless steel, ASTM A276 and shall be of a diameter not less than those listed in AWWA C504, Class 150B.

Shaft seals shall be furnished where the shaft projects thru the valve body. Shaft seals shall be standard split-v type packing or of an O-ring design.

Valves shall be fitted with sleeve type bearings contained in the trunions of the valve body. Bearing material shall be nylon for valves thru 20-in and fiberglass with teflon lining for valves 24-in and larger.

Valve manufacturer shall furnish and mount operator suitable for buried service. Operators shall be self-locking and suitable for submergence to 20-ft. A 2-in square operating nut shall be furnished. Operator stops shall be capable of withstanding an input of 450 ft-lbs.

All valves shall be hydrostatically and leak tested.

Valve class shall be AWWA Class 150B with operators sized for bi-directional flow.

Valves shall be manufactured by Henry Pratt.

**General:** This work shall be performed according to Section 564 of the "Standard Specifications" and the following:

- A. American Society for Testing and Materials (ASTM)
  - 1. ASTM A48 - Standard Specification for Gray Iron Castings
  - 2. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings
  - 3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  - 4. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes
  - 5. ASTM A536 - Standard Specification for Ductile Iron Castings
- B. American Water Works Association (AWWA)
  - 1. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron and Pressure Pipe and Fittings
  - 2. AWWA C504 - Rubber-Seated Butterfly Valves.
- C. American National Standards Institute (ANSI)
  - 1. ANSI B16.1 – Cast Iron Pipe Flanges and Flanged Fittings.
- D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

#### *SUBMITTALS*

Submit materials required to establish compliance with this Section for shop drawings. Submittals shall include the following:

Manufacturer's literature, illustrations, specifications and engineering data including:

- 1. Dimensions
- 2. Size
- 3. Materials of Construction
- 5. Weight.
- 6. Coating
- 7. Actuator Weight
- 8. Calculations for Actuator Torque where applicable

#### Test Reports

1. Four copies of all certified shop test results specified herein.

#### Operation and Maintenance Manuals

1. Submit complete operation and maintenance manuals including copies of all approved Shop Drawings.

#### Certificates

1. Certificates of compliance where required by referenced standards: For each valve specified to be manufactured and/or installed in accordance with AWWA and other standards, submit an affidavit of compliance with the appropriate standards, including certified results of required tests and certification of proper installation

#### *QUALITY ASSURANCE*

##### Manufacturer's Qualifications

1. Valves and appurtenances provided under this Section shall be the standard product in regular production by manufacturers whose products have proven reliable in similar service for at least 10 years. If required, the manufacturer shall furnish evidence of installation in satisfactory operation.
2. All units of the same type shall be the product of one manufacturer.

##### Design Criteria

1. All valves and appurtenances shall be new and in perfect working condition. Valves shall be designed for continuous use with a minimum of maintenance and service required and shall perform the required function without exceeding the safe limits for stress, strain or vibration. In no case will used or damaged valves be acceptable. The selection of equipment to meet the specified design conditions is the responsibility of the Contractor. Both workmanship and material shall be of the very best quality and shall be entirely suitable for the service conditions specified.

##### Source Quality Control

1. Rubber-seated butterfly valves shall be shop tested in accordance with AWWA C504.
2. Obtain each type of valve from no more than one manufacturer.

#### *DELIVERY, STORAGE AND HANDLING*

Deliver materials to the site to ensure uninterrupted progress of the work.

Protect threads and seats from corrosion and damage. Rising stems and exposed stem valves shall be coated with a protective oil film which shall be maintained until time of use.

Furnish covers for all openings. All valves 3-in and larger shall be shipped and stored on site until time of use with wood or plywood covers on each valve end.

Store delivered equipment to permit easy access for inspection and identification. Any corrosion in evidence at the time of CLCJAWA acceptance shall be removed, or the valve shall be removed from the job.

**Installation:** This work shall be performed according to the following:

#### *INSPECTION AND PREPARATION*

During installation of all valves and appurtenances, verify that all items are clean, free of defects in material and workmanship and function properly.

All valves shall be closed and kept closed until otherwise directed by the Engineer.

#### *FIELD TESTS AND ADJUSTMENTS*

Conduct a functional field test of each valve, including actuators and valve control equipment, in presence of Engineer to demonstrate that each part and all components together function correctly. All testing equipment required shall be furnished by the Contractor.

#### *MANUFACTURER'S SERVICE*

Following installation of the butterfly valves, furnish the services of a qualified, factory-trained representative of the manufacturer of the respective valves, to check the installations before they are placed in operation, supervise initial operations and testing in the presence of the Engineer, instruct the plant personnel in care and maintenance of the equipment, and make all necessary field adjustments. A minimum of 8-hour days, which may not necessarily be consecutive, shall be provided for these services. In the event of trouble with the equipment, the representative of the respective manufacturer shall revisit the site as often as necessary until all troubles are corrected and the installation is entirely satisfactory.

**Hydrostatic Tests:** This work shall be performed according to Article 561.04 of the "Standard Specifications" and Special Provision Z00XXXXX Prestressed Concrete Cylinder Pipe and Fittings.

**Disinfection of Water Main:** This work shall be performed by the Contractor in accordance to Article 561.05 of the "Standard Specifications" and Special Provision Z00XXXXX Prestressed Concrete Cylinder Pipe and Fittings.

**Basis of Payment:** This work will be paid for at the contract unit price each for BUTTERFLY VALVES 20".

**56400820 FIRE HYDRANT WITH AUXILIARY VALVE AND VALVE BOX**

**Description:** This work will consist of furnishing all labor, materials, equipment and incidentals required and provide all buried valves, hydrants and appurtenances for blow-offs as shown on the Drawings and as specified herein.

**Materials:** The materials shall be as shown in the Drawings and as specified herein.

*FIRE HYDRANTS (BLOW-OFFS)*

Fire hydrants shall be dry-barrel type conforming to the requirements of AWWA C502. Hydrants shall be designed such that the hydrant valve closes with line pressure preventing loss of water and consequent flooding in the event of traffic damage.

Hydrants shall have 6-in mechanical joint inlet connections, two 2-1/2-in hose connections and one 4-1/2-in pumper connection. Threads for the hose and pumper connections shall be in accordance with National Standard Thread. Hydrants shall be according to manufacturer's standard pattern. Hydrants shall be equipped with O-ring packing. Each nozzle cap shall be provided with a Buna-N rubber washer.

Hydrants shall be so arranged that the direction of outlets may be turned 90 degrees without interference with the drip mechanism or obstructing the discharge from any outlet.

A bronze or rustproof steel nut and check nut shall be provided to hold the main hydrant valve on its stem.

Hydrant valve opening shall have an area at least equal to that area of a 5-1/4-in minimum diameter circle and be obstructed only by the valve rod. Each hydrant shall be able to deliver 1000 gallons minimum through its two 2-1/2-in hose nozzles when opened together with a loss of not more than 3 psi in the hydrant.

Hydrants shall be designed for installation in a trench that will provide minimum cover as noted on Drawings. Hydrant extensions shall be as manufactured by the company furnishing the hydrants and of a style appropriate for the hydrants as furnished.

Hydrants shall open by turning operating nut to left (counterclockwise) and shall be marked with a raised arrow and the work "open" to indicate the direction to turn stem to open hydrant.

Hydrants shall be furnished with caps, double galvanized steel hose cap chain, galvanized steel pumper hose cap chain, a galvanized steel chain holder and any other hooks and/or appurtenances required for proper use.

Hydrant operating nut shall be AWWA Standard pentagonal type measuring 1-1/2-in point to flat.

Hydrants shall be hydrostatically tested as specified in AWWA C502.

Hydrants shall be Super Centurion 250 Fire Hydrant as manufactured by Mueller Company or WB67-250 by Waterous.

All iron work to be set below ground, after being thoroughly cleaned, shall be painted with two coats of asphalt varnish specified in AWWA C502. Iron work to be left above ground shall be shop painted with two coats of paint of quality and color to correspond to the present standard of the CLCJAWA.

### *RESILIENT SEATED GATE VALVES*

Valves shall be manufactured in accordance with AWWA C509 and as specified herein. Valves shall be: Series 2360 resilient wedge gate valve (available in 2-in through 12-in) by Mueller Company or Series 500 NRS by American Flow Control.

### *VALVE BOXES*

All gate valves shall be provided with extension shafts, operating nuts and valve boxes as follows:

1. Extension shafts shall be Type 304 stainless steel and the operating nut shall be 2-in square. Shafts shall be designed to provide a factor of safety of not less than four. Operating nuts shall be pinned to the shafts.
2. Top of the operating nut shall be located 2-in below the rim of the valve box.
3. Valve boxes shall be as manufactured by Clow Water Systems Company, Mueller Company or Tyler Union and shall be a heavy pattern cast iron, three piece, telescoping type box with dome base suitable for installation on the buried valves. Inside diameter shall be at least 4-1/2-in. Barrel length shall be adapted to the depth of cover, with a lap of at least 6-in when in the most extended position. Covers shall be cast iron with integrally cast locking type with CLCJAWA's locking bolt from McGard Company and direction-to-open arrow. Aluminum or plastic are not acceptable. A means of lateral support for the valve extension shafts shall be provided in the top portion of the valve box.
4. The upper section of each box shall have a top flange of sufficient bearing area to prevent settling. The bottom of the lower section shall enclose the stuffing box and operating nut of the valve and shall be oval. A valve box alignment device shall be used on the lower section and gate valve to properly align the valve box to the valve.
5. All fasteners shall be Type 304 stainless steel.

**General:** This work shall be performed according to Section 564 of the "Standard Specifications" and the following:

- A. American Society for Testing and Materials (ASTM)
  1. ASTM A48 - Standard Specification for Gray Iron Castings
  2. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings

3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  4. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes
  5. ASTM A536 - Standard Specification for Ductile Iron Castings
- B. American Water Works Association (AWWA)
1. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron and Pressure Pipe and Fittings
  2. AWWA C502 - Dry-Barrel Fire Hydrants
  3. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service
- C. American National Standards Institute (ANSI)
1. ANSI B16.1 – Cast Iron Pipe Flanges and Flanged Fittings.
- D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

### *SUBMITTALS*

Submit materials required to establish compliance with this Section for shop drawings. Submittals shall include the following:

Manufacturer's literature, illustrations, specifications and engineering data including:

1. Dimensions
2. Size
3. Materials of Construction
5. Weight.
6. Coating

### Test Reports

1. Four copies of all certified shop test results specified herein.

### Operation and Maintenance Manuals

1. Submit complete operation and maintenance manuals including copies of all approved Shop Drawings.



#### Certificates

1. Certificates of compliance where required by referenced standards: For each valve specified to be manufactured and/or installed in accordance with AWWA and other standards, submit an affidavit of compliance with the appropriate standards, including certified results of required tests and certification of proper installation

#### *QUALITY ASSURANCE*

##### Manufacturer's Qualifications

1. Valves and appurtenances provided under this Section shall be the standard product in regular production by manufacturers whose products have proven reliable in similar service for at least 10 years. If required, the manufacturer shall furnish evidence of installation in satisfactory operation.
2. All units of the same type shall be the product of one manufacturer.

##### Design Criteria

1. All valves and appurtenances shall be new and in perfect working condition. Valves shall be designed for continuous use with a minimum of maintenance and service required and shall perform the required function without exceeding the safe limits for stress, strain or vibration. In no case will used or damaged valves be acceptable. The selection of equipment to meet the specified design conditions is the responsibility of the Contractor. Both workmanship and material shall be of the very best quality and shall be entirely suitable for the service conditions specified.

##### Source Quality Control

1. Resilient-seated gate valves shall be shop tested in accordance with AWWA C509.
2. Obtain each type of valve from no more than one manufacturer.

#### *DELIVERY, STORAGE AND HANDLING*

Deliver materials to the site to ensure uninterrupted progress of the work.

Protect threads and seats from corrosion and damage. Rising stems and exposed stem valves shall be coated with a protective oil film which shall be maintained until time of use.

Furnish covers for all openings. All valves 3-in and larger shall be shipped and stored on site until time of use with wood or plywood covers on each valve end.

Store delivered equipment to permit easy access for inspection and identification. Any corrosion in evidence at the time of CLCJAWA acceptance shall be removed, or the valve shall be removed from the job.

**Installation:** This work shall be performed according to the following:

### *INSTALLATION OF BURIED VALVES AND VALVE BOXES*

Buried valves shall be cleaned and manually operated before installation. Buried valves and valve boxes shall be set with the stem vertically aligned in the center of the valve box. Valves shall be set on a firm foundation and supported by tamping pipe bedding material under the sides of the valve. The valve box shall be supported during backfilling and maintained in vertical alignment with the top flush with finish grade. The valve box shall be set so as not to transmit traffic loads to the valve. The valve and all piping connecting it to the main water pipeline shall have restrained joints or otherwise supplied with mechanical restraint.

Before backfilling, all exposed portions of any bolts shall be coated with two coats of bituminous paint.

### *INSTALLATION OF FIRE HYDRANTS*

Fire hydrants shall be set at the locations as shown on the Drawings and bedded on a firm foundation. Hydrants and connecting pipe shall have at least the same depth of cover as the distributing pipe. A drainage pit as detailed on the Drawings shall be filled with screened gravel and compacted. The hydrants shall be set upon a slab of concrete not less than 4-in thick and 15-in square. During backfilling, additional screened gravel shall be brought up around and 6-in over the drain port. Each hydrant shall be set in true vertical alignment and properly braced.

Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Minimum bearing area shall be as shown on the Drawings. Felt roofing paper shall be placed around hydrant elbow before placing concrete. Care shall be taken to ensure that concrete does not plug the drain ports.

The hydrant shall be tied to the pipe with restrained mechanical joints, galvanized, painted, or otherwise rustproof treated. Hydrant paint shall be touched up as required after installation. Fire hydrants shall be painted, in accordance with CLCJAWA's standard practice, blue.

**Hydrostatic Tests:** This work shall be performed according to Article 561.04 of the "Standard Specifications" and Special Provision 56103000 Ductile Iron Water Main 6".

**Disinfection of Water Main:** This work shall be performed by the Contractor in accordance to Article 561.05 of the "Standard Specifications" and Special Provision 56103000 Ductile Iron Water Main 6".

**Basis of Payment:** This work will be paid for at the contract unit price each for FIRE HYDRANTS WITH AUXILIARY VALVE AND VALVE BOX.

**X5610680 WATER MAIN PROTECTION**

**Description:** Work performed under this portion of the specifications shall consist of providing all engineering, supervision, labor, equipment and materials to extend an operating cathodic protection system for the pipeline.

**Materials:** The materials shall be as shown in the Drawings and as specified herein.

*DESCRIPTION*

The cathodic protection system shall include, but not be limited to providing the material and installation of the following:

1. Sacrificial Anodes.
2. Test Stations.
3. Electrical Continuity Bonding.
4. Insulating flange kits.
5. Coatings for joint connections, buried flanges, and buried valves.

Definitions: Definitions related to the cathodic protection work are as follows:

1. Cathodic Protection Installer: A contractor who performs the installation of cathodic protection system of the type specified herein and indicated on the Drawings.
2. Corrosion Engineering Firm: A professional engineering firm specializing in the design, engineering, and quality control and assurance of cathodic protection systems.

Foreign Contracts: All piping provided with cathodic protection shall be free from contact with other metallic structures. The contractor shall insure that no metal-to-metal contact exists with any foreign structures including casings, other pipelines, wall sleeves, reinforcing steel, metallic sheet piling, electrical grounding systems, and the like.

*MATERIALS*

Included: Cathodic protection materials to be incorporated into the Project include, but are not limited to the following:

1. Coating, wrapping or polyethylene encasement of ductile iron or steel pipe as specified in the pipe specifications.
2. Electrical Continuity Bonding.
3. Dielectric Insulation.
4. Galvanic Anodes.

5. Test Stations.
6. Wire, cable and splices.

### *ELECTRICAL CONTINUITY BONDING*

Reference Standards: Meet requirements of the following, except to the extent that more detailed or more stringent requirements indicated by the Project Documents, including requirements of this Section and of governing codes and regulations:

1. ASTM D1248 – Specification for Polyethylene Plastic Molding and Extrusion Materials, Type 1, Class C, Grade 5.

#### Electrical Bond Wire:

1. Description: Electrical bond wires shall be a minimum No. 2 AWG seven strand copper cable furnished with a high molecular weight polyethylene insulation (HMWPE). One to 1-1/2 inches of HMWPE insulation shall be removed from each end of all bond cables. To achieve more flexibility in the bond cables a THHN/THWN insulation will be acceptable.
2. Quantities:
  - a. Two bond cables shall be used across each joint requiring their use.
  - b. Follower rings, lock rings or other mechanical type joint piping shall be electrically bonded to either side of their respective pipe joints using one No. 12 AWG bond wire with THHN/THWN insulation.

### *DIELECTRIC INSULATION*

Applications: Required applications of dielectric insulating materials include, but are not limited to the following:

1. At locations where new metallic underground piping is mechanically connected to existing underground metallic piping which is not being cathodically protected.
2. Where the cathodically protected pipe comes above grade and is supported against any other metallic structure.
3. Where prestressed concrete cylinder pipe is electrically connected to steel or ductile iron pipe.

#### Insulating Flange Assemblies:

1. The standard insulating flange assemble shall consist of a full-faced neoprene faced phenolic gasket, with full length insulating sleeves and double washers.
2. The gasket material shall consist of neoprene sheets, factory applied to both sides of a laminated sheet of phenolic.

3. The operating temperature of this gasket shall be from -65° F to 175° F.
4. The full-length sleeve shall be 1/32-inch thick phenolic and the insulating washers shall be 1/8-inch thick high strength phenolic.
5. Acceptable Products: Subject to meeting requirements, acceptable manufacturer's product which may be incorporated into work include the following:
  - a. Central Plastics
  - b. Flange Protection & Gaskets
  - c. PSI Industries

Sleeve Seal: Seal shall be a modular mechanical type consisting of expandable, interlocking synthetic rubber links shaped to continuously fill and seal the annular space between penetrating pipe and sleeve or opening. Provide with stainless steel threaded fasteners for exterior applications and zinc coating fasteners for interior applications. Service and size designations of seals shall meet instruction of manufacturer for application.

1. Acceptable Products: Subject to meeting requirements, acceptable manufacturer's products which may be incorporated in the work include the following:
  - a. Thunderline Corporation, Link-Seal.

### *CP MONITORING STATIONS*

CP monitoring stations shall be Model TSP-CLCJAWA test stations as manufactured by William Frick and Company shall be used at all test station locations. Test stations are the 3" size and shall be supplied with five terminals. Each test station shall have a Cu/CuSO<sub>4</sub> reference electrode. The test station shall extend 3 feet above finished grade.

Wiring: All monitoring station wiring shall be as noted on the drawings and as specified herein.

All wire shall be identified using 6 digit cable identification label on nylon wire markers as shown below. The letters and numbers shall be printed.

1. Digits 1 and 2: Pipe Diameter in Inches
2. Digit 3: Pipe Material (use letters below)

C	Cast Iron
S	Steel
R	Reinforced Concrete
P	Prestressed Concrete Cylinder
K	Copper
W	Wrought Iron
G	Galvanized
H	Riveted Steel
B	Brass

- 3. Digit 4: Pipe Lining (use letters below)
- 4. Digit 5: Pipe Coating (use letters below)

- C Cement Mortar
- B Coal Tar
- M Asphalt Mastic
- U Unlined
- W Dipped and Wrapped
- E Epoxy
- P Plastic
- A Aggregate

- 5. Digit 6: Station

- H High Station Cable
- L Low Station Cable

Connections: Monitoring station wiring shall be connected to the pipelines by thermite brazing. Proper size molds, copper sleeves and charges shall be in accordance with the manufacturer's recommendations. Thermo-Weld or Cadweld is acceptable.

Coating: All thermite brazed connections shall be coated with a bituminous compound conforming to MIL-C-183480A and covered with thermite weld caps.

#### *GALVANIC ANODE SYSTEMS*

Description: The metallurgical composition of the zinc ribbon anodes shall be as follows:

<u>ELEMENT</u>	<u>% COMPOSITION</u>
Aluminum	0.01 Maximum
Manganese	0.50 to 1.3
Copper	0.02 Maximum
Nickel	0.001 Maximum
Iron	0.03 Maximum
Other – (Each)	0.05 Maximum
Other – (Total)	0.30 Maximum
Magnesium	Balance

Anode Backfill Material: Chemical backfill material shall be used around all zinc ribbon anodes installed in the ground. Backfill shall be provided to reduce the contact resistance to earth, to provide a uniform environment for the anodes, to retain moisture around the anodes and to prevent polarization.

1. All zinc ribbon anodes shall come prepackaged in a backfill material consisting of the following composition:
  - a. Ground Hydrated Gypsum: 75%
  - b. Powdered Bentonite: 20%
  - c. Anhydrous Sodium Sulfate: 5%
2. The backfill shall have a grain size such that 100% is capable of passing through a 20-mesh screen and 50% shall be retained by a 100 mesh screen.
3. The backfill mixture shall be firmly packaged around the anode within a cotton bag by means of adequate vibration.
4. For standard cast zinc ribbon ingots, the weight of backfill required shall be as follows:

Anode Weight	Backfill Weight	Total Weight
<u>(Pounds)</u>	<u>(Pounds)</u>	<u>(Pounds)</u>
48	58	106

Anode Lead Wires:

1. The standard lead wire for a zinc ribbon anode shall be a minimum 10-foot length of No. 12 AWG solid copper wire equipped with TW or THW insulation.

Lead Wire Connection to Anode:

1. Zinc ribbon anodes shall be cast with a perforated, galvanized steel core, or 10 gauge galvanized spiral wound steel wire, with the weight of the core not to exceed 0.10 pounds per linear foot.
2. One end of the anode shall be recessed to expose the core for the lead wire connection.
3. The lead wire shall be silver-soldered to the core and the connection fully insulated by filling the recess with an electrical potting compound.

## CONDUCTORS

Material: All conductors shall be copper.

Insulation: No. 12 AWG wires with THHN/THWN insulation shall comply with Federal Specification J-C-30. No. 8 AWG wire or larger shall be cathodic protection cable specifically designed for the purpose, shall comply with ASTM D 1248 and shall be insulated with high molecular weight polyethylene, Type I, Class C, Grade 5. The minimum thickness of insulation at any point shall not be less than 90 percent of the nominal wall thickness. The wall thickness for AWG size No. 8 through No. 2 shall be 7/64-inch and for sizes No. 1 through No. 4/9, 8/64-inch.

Connectors: All connections used to splice sections of the DC wiring shall be solid copper compression crimpers as manufactured by Burndy, Penn-Union, or Thomas & Betts.

Sealant: All buried splices shall be sealed in epoxy resin splice kits. Note that no splices are permitted in the anode lead wires from the anode to the junction box.

## SPLICES

Connectors: All connections used to splice sections of the DC wiring shall be soldered or crimped.

Sealant: All buried splices shall be sealed with electrical putty, two, half lapped layers of rubber tape followed by two, half lapped layers of plastic tape. The final connection shall then be coated with Scotchkote by 3M.

**General:** This work shall be performed according to the following:

- A. American Society for Testing and Materials (ASTM)
  1. D1248 - Polyethylene Insulation.
- B. Underwriters' Laboratories, Inc. (UL)
  1. UL-83 - Thermoplastic Insulated Wires.
  2. UL-6 - Rigid Metal Electrical Conduit.
  3. UL-486 - Wire Connectors and Soldering Lugs for Use with Copper Conductors.
  4. UL-510 - Insulating Tape.
  5. UL-514 - Outlet Boxes and Fittings.
- C. National Electrical Code (NEC)
- D. National Association of Corrosion Engineers (NACE)



1. NACE Standard RP-01-69 (latest revision) - Recommended External Corrosion on Underground or Submerged Piping Systems.

E. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

### *SUBMITTALS*

**Qualification Data:** Submit Contractor qualification data. The Contractor shall submit evidence of experience in the installation of cathodic protection systems.

**Product Data:** Submit manufacturer's specifications, recommendations, and installation instructions for each product item. All product data shall be approved by the Engineer.

**Shop Documents:** Submit shop drawings and specifications for the cathodic protection system. The shop documents shall be approved by the Engineer.

**Compliance Certificate:** The Contractor shall submit written acknowledgment stating that the cathodic protection system was provided and meets the requirements of the project documents.

**As-Built Drawings:** The Contractor shall submit one reproducible and one copy of as-built, dimensional drawings to the Engineer prior to system commissioning.

**Guarantees:** Shall comply with the Special Conditions.

### *QUALITY ASSURANCE*

**Standards:** The cathodic protection installation shall comply with applicable requirements, codes, laws and ordinances of Federal, State and local bodies having jurisdiction; the requirements of the local power company; the engineers of the Villages or Agencies; the electrical requirements and/or codes of the insurance underwriters; the Standards of the National Electrical Manufacturers Association (NEMA); Underwriters' Laboratories (UL); the Institute of Electrical and Electronics Engineers (IEEE); the National Association of Corrosion Engineers (NACE), including applicable supplements, bulletins, and special rulings.

Where more stringent requirements than code are shown or specified, the more stringent requirements shall apply. All electrical items shall be UL listed or labeled, where such listing or labeling is obtainable.

**Installer Qualifications:** Cathodic Protection Contractor shall have a minimum of 5 years certifiable experience in the type of cathodic protection work required for the project and shall be acceptable to the Engineer.

**Installation:** This work shall be performed according to the following:

### *GENERAL*

The Contractor shall furnish all necessary labor, tools, materials, and equipment to install a complete and functioning corrosion monitoring and control system. The corrosion monitoring

and control system shall be installed in accordance with the Standards of the National Association of Corrosion Engineers.

### *ZINC RIBBON ANODES*

Location: Anodes are also placed at each sectioning valve for all pipe materials.

Placement: All anodes shall be installed in existing backfill, a minimum of three feet from the outside wall of the structure to be protected and below the center line of that structure.

Connection: Anode lead wires shall be thermite brazed to the structure.

### *TEST STATIONS*

Location: The test stations shall be installed at each sectioning valve and at intervals no less than 200 feet along the route of the pipe. Contractor shall place test stations at exact locations given by the Engineer

Inspection: All monitoring station lead wires shall be continuous with no cuts or breaks in the insulation.

Attachment: All monitoring station lead wires shall be attached to the structure by thermite brazing.

Method: The monitoring station shall be installed and wired as specified herein. Monitoring station wires shall be coiled inside the junction box.

Backfill: During the backfilling operation, test station wires shall be protected to avoid damage to wire insulation and conductor integrity.

1. Upon completion of backfilling, the continuity of the test wires to the structure shall be verified by the Contractor using a suitable meter.
2. Any test wire found to have a high resistance connection shall be repaired.

### *ELECTRICAL CONTINUITY BONDS*

Locations: All below grade mechanical joints except where insulating flanges are to be installed shall be made electrically continuous by thermite brazing a bond cable across each joint as specified herein. The other exception to this bonding requirement occurs one pipe length from each valve on both sides of the sectioning valves.

Material: All bond cables across pipe lengths shall be as stated above.

Connection: Thermite brazing techniques used for connection of the bond cables shall comply with this specification.

### *CABLE*

Burial: Underground cables, wires and connection shall be buried at a minimum depth of 3-feet below grade, with a 6" minimum separation from other underground structures.

Splices: All splices and repairs to cathodic protection wires and cables shall be sealed against moisture penetration.

Backfill: All wiring shall be backfilled with material free from rocks and debris which could damage the insulation.

### *THERMITE BRAZING*

Materials: Thermite brazing techniques shall comply with the manufacturer's recommendations. Only proper size cartridges and welders shall be permitted.

Cleaning: Prior to brazing, an area of piping three inches square shall be cleaned to bright metal with a grinder.

Testing: The slag shall be removed from the completed braze with a hammer. The adequacy of each braze shall be demonstrated by gently striking the connection with a hammer.

Coating: The cleaned piping surface, including the brazed connection and any exposed copper wire, shall be coated with a cold applied coal tar compound.

### *ISOLATION*

Flange: Flange isolation shall be provided to electrically isolate all new piping from non cathodically protected existing piping, all transitions between above and below grade pipe, and at all locations where prestressed concrete cylinder pipe is connected to steel or ductile iron pipe.

Isolation: No metallic structures shall be permitted in contact with the electrically isolated sections of underground piping.

All pipe penetrations through walls require the use of sleeve seals described above.

The Contractor shall contact the utility companies for the location of their underground structures before digging, and he shall be responsible for any and all damage to existing cathodic protection installations and utility lines in the construction area. Utility lines shall be protected and safeguarded from damage during all earthwork operation and, if damaged, shall be repaired by the utility company at the Contractor's expense. The above provisions shall be applicable to all service lines or utility structures, all or any portion of which protrudes above the original ground surface, or lies beneath the ground surface within any area of operation.

### *COATING INSPECTION*

All coatings shall be visually inspected for "holidays" and "breaks" during construction. The contractor shall provide the electrical inspection equipment and shall furnish an operator for the equipment.

The electrical test equipment shall be a portable low amperage adjustable voltage, pulse-type holiday detector. The holiday detector shall be furnished with a coil spring electrode for use with lengths of coated pipe and a suitable brush type electrode for irregular coated surfaces.

Electrical field-testing shall be conducted by the Contractor in the field with a portable holiday detector and shall conform to the procedure outlined hereafter.

1. Voltage: The operating voltage of the detector shall be within the range applicable to the specific coating. The detector voltage shall be adjusted twice daily, once before starting work in the morning and again before starting work in the afternoon.
2. Rate: after the voltage has been properly adjusted, the electrode shall be passed over the coated and wrapped surface one time only, at the rate of approximately 34' 0" to 50' 0" per minute.
3. Holidays: Any evidence of holidays shall be marked for patching prior to backfilling.

### TESTING

The Contractor shall employ a NACE certified cathodic protection specialist to serve as a representative of the Contractor to assure proper installation.

The cathodic protection specialist shall determine what modifications are required to assure the system functions as designed. The Owner's Representative shall approve any modifications.

The cathodic protection specialist shall be responsible for supervising the installation to insure that all cathodic protection work is performed in accordance with the specifications. He shall be further responsible for the establishment of repair procedure on damaged or defective coatings.

The cathodic protection specialist shall be responsible for all adjustments of the system as may be required to assure proper operation. In addition, he shall test the system and submit a written report in compliance with the NACE standard.

The cathodic protection specialist shall conduct tests of the cathodic protection system after completion of the installation. Testing will be performed in accordance with accepted practices as recommended by the Nation Association of Corrosion Engineers. All insulating fittings shall be tested to insure proper electrical insulation. Structure-to-soil potential measurements shall be recorded throughout the system at all test stations and above grade appurtenances. The rectifier unit shall be tested to insure proper polarity of the cables and meters shall be calibrated. The cathodic protection system shall be adjusted in such a manner as to comply with the criteria for protection as given in NACE Standard RP-01-69 (1983).

The cathodic protection specialist shall be responsible for cooperating with owners of foreign structures in order to coordinate corrosion control activities. Interference testing shall be conducted with all interested parties to insure that the subject cathodic protection is neither adversely affecting other underground metallic structures nor experiencing detrimental effects from neighboring cathodic protection systems. In the event that interference problems are detected, the cathodic protection specialist shall cooperate with the companies involved until a mutually satisfactory solution is reached. A written report shall be submitted to the Owner's

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Representative and shall include all test data, analysis of the data and instructions for operation and maintenance of the cathodic protection system.

**Basis of Payment:** This work will be paid at the contract unit price per foot for WATER MAIN PROTECTION, which price shall include all work shown on the Drawings and specified herein.

**X5610720 WATER MAIN REMOVAL, 20"**

Description. Work shall include the removal of existing water main after the proposed main is in service and accepted. All removals shall be discussed with the applicable CLCJAWA and the applicable municipalities prior to the work and CLCJAWA the applicable municipalities shall be notified 24 hours prior to abandonment. This work also includes backfilling the trench where the water main was removed, unless grading operations dictate otherwise.

Method of Measurement. This work will be measured for payment per FOOT of water main removed.

Basis of Payment. Work shall be paid as WATER MAIN REMOVAL, 20".

**Z0001100 AIR RELEASE VALVE**

**Description:** Furnish all labor, materials, equipment and incidentals, and install all combination air valve assemblies as shown on the Drawings and as specified herein. This section includes 1-inch through 8-inch Combination Air-Release and Air/Vacuum Valve Assemblies (Combination Air Valves) for potable water systems, which includes the combination air-release and air/vacuum valve, tap to water main, inlet piping and appurtenances, vent piping and appurtenances, and vault enclosure and appurtenances.

**Materials:** The materials shall be as shown in the Drawings and as specified herein.

**COMBINATION AIR VALVE ASSEMBLIES**

The Combination Air Valve shall be new and the product of a manufacturer regularly engaged in the manufacturing of air release/air vacuum valves having similar service and size. Acceptable manufacturers include APCO, Val-Matic, GA Industries, or Cla-Val Series MTP36-CAV-AC.

Combination Air Valves shall meet or exceed the latest revisions of AWWA C512 and shall meet or exceed the requirements of this Specification.

All Combination Air Valve components in contact with potable water shall conform to the requirements of NSF 61.

The valves shall be designed for potable water application and perform to a working pressure from 10 psi to 150 psi, test pressure of 300 psi, surge pressure of 250 psi minimum (unless stated otherwise in the Contract Documents), and each orifice size must be sufficient to meet the requirements set forth in AWWA M51 and indicated on the Drawings.

The valves shall be able to function during high volume discharge through the large orifice usually during pipeline filling, high volume intake through the large orifice usually during pipeline draining, and pressurized air discharge. The valve shall release small amounts of air from the pipeline while it is under pressure. The valve shall perform the functions of both Air Release and Air/Vacuum Valves and furnished as a single body or dual body type as indicated on the plans.

The valve shall have surge dampening/controlled discharge rates. The valve shall have an integral surge alleviation mechanism (double-acting throttling device) which shall operate automatically to limit transient pressure rise or shock induced by closure due to high velocity air discharge or the subsequent rejoining of the separated water columns. The limitation of the pressure rise shall be achieved by decelerating the approaching water prior to valve closure. The surge alleviation mechanism should not restrict the full inflow capacity of the valve.

Stainless steel shall be used for internal parts. The valve body shall be AISI 304 stainless steel or ASTM A536 ductile iron, equipped with intake and discharge flanges.

The inlet/discharge orifice area shall be equal to the nominal size of the valve.

Supply all ductile iron Combination Air Valves with a factory applied fusion bonded epoxy coating with a final coating thickness of 16 mils minimum.

TAP

Provide outlet on 20-inch blind flange for 20-inch mains, 24-inch blind flange for 24-inch mains or 30-inch blind flange for 30-inch and large mains.

### *INLET PIPING*

For concrete cylinder or steel water lines with:

1. Steel pipe
  - a. With flanged connection with flanged outlets fabricated into the blind flange, provide an isolation kit at gate valve
  - b. For Ductile Iron or PVC water mains:
    - 1) Ductile iron with flanged connection at gate valve
  - c. Inlet piping shall contain a 2-inch outlet between the tap and the isolation valve with the following:
    - 1) Corporation and curb stop (C.C. thread with flare)
2. K Copper riser between the corporation and curb stop
  - a. Curb stop shall be installed a maximum of 18 inches below the vault manhole cover.

### *ISOLATION VALVES*

Gate Valve (flanged) in with:

1. Hand operator for 2-inch gate valves
2. 2-inch operating nut, non-rising stem with enclosed miter gearing for 3-inch and larger gate valves

### *VENTS*

2-inch vent piping shall be Schedule 40 galvanized steel.

For 3-inch and larger, vent piping shall be ductile iron equipped with loosened flange bolts or breakable flanges at ground level.

The piping shall be at a minimum as large as the Combination Air Valve.

All vents shall have a stainless steel (AISI 304) screen.

Vault

1. Provide a concrete manhole in accordance with IDOT Standard Specifications



2. Secure Air Valve to vault wall using a galvanized or stainless steel bracket.  
Finishes

1. Primer Materials

a. Prime Vent Piping within vault

2. Finish Materials

a. Paint Vent Piping within vault, as well as above ground.

b. Color shall be safety blue to match existing CLCJAWA painted appurtenances.

**General:** This work shall be performed according to the following:

A. American Iron and Steel Institute (AISI).

B. ASTM International (ASTM):

1. A536, Standard Specification for Ductile Iron Castings.

C. American Water Works Association (AWWA):

1. C512, Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service.

2. M51, Air-Release, Air/Vacuum, and Combination Air Valves.

D. NSF International (NSF):

1. 61, Drinking Water System Components - Health Effects.

E. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply, unless specifically cited.

**DEFINITIONS**

1. Combination Air Valve: A device having the features of both an air-release valve and an air/vacuum valve

2. Inlet: The opening at the base of the Combination Air Valve mechanism through which air and water from the pipeline enters

3. Inlet Piping: The piping and appurtenances between the pipeline and the valve inlet

4. Orifice: The opening in the Combination Air Valve mechanism through which air is expelled from or admitted into the pipeline or piping system. Some valves may have multiple orifices.
5. Outlet: The opening at the top of Combination Air Valve mechanism, including the orifice, through which air enters or exits the Air Valve
6. Vent Piping: The piping and appurtenances from the Combination Air Valve outlet to its termination point outside the vault

### *SUBMITTALS*

Submit materials required to establish compliance with this Section for shop drawings. Submittals shall include the following:

Manufacturer's literature, illustrations, specifications and engineering data including:

1. Dimensions
2. Size
3. Materials of Construction
4. Weight.
5. Coating

### Product Data

1. Combination Air Valves
  - a. Application type
  - b. Working pressure ratingc. Test pressure rating
  - c. Surge pressure rating
  - d. Inlet size
  - e. Small orifice size
  - f. Large orifice size
2. Valve vault and appurtenances
3. Tapping appurtenances
4. Isolation valves
5. Fittings

6. Vent piping
7. Vent cover and/or enclosure
8. Vent enclosure and/or pipe bollard protection

#### Test Reports

1. Four copies of all certified shop test results specified herein.

#### Operation and Maintenance Manuals

1. Submit complete operation and maintenance manuals including copies of all approved Shop Drawings.

#### Certificates

1. Certificates of compliance where required by referenced standards: For each valve specified to be manufactured and/or installed in accordance with AWWA and other standards, submit an affidavit of compliance with the appropriate standards, including certified results of required tests and certification of proper installation.

### QUALITY ASSURANCE

#### Manufacturer's Qualifications

1. Valves and appurtenances provided under this Section shall be the standard product in regular production by manufacturers whose products have proven reliable in similar service for at least 10 years. If required, the manufacturer shall furnish evidence of installation in satisfactory operation.
2. All units of the same type shall be the product of one manufacturer.

#### Design Criteria

1. Combination air valves shall be in accordance with AWWA C512. All valves and appurtenances shall be new and in perfect working condition. Valves shall be designed for continuous use with a minimum of maintenance and service required and shall perform the required function without exceeding the safe limits for stress, strain or vibration. In no case will used or damaged valves be acceptable. The selection of equipment to meet the specified design conditions is the responsibility of the Contractor. Both workmanship and material shall be of the very best quality and shall be entirely suitable for the service conditions specified.

#### Source Quality Control

Testing and inspection of Combination Air Valves shall be in accordance with

AWWA C512.

Each Combination Air Valve shall be marked in accordance with AWWA C512.

#### Field Quality Control

##### A. Field Inspections

1. Pipe the large and small orifices directly to the vent piping. There direct discharge of an orifice to an underground vault.
2. The valve shall perform as intended with no deformation, leaking or damage of any kind for the pressure ranges indicated.
3. Before acceptance of the installed valve, CLCJAWA Staff shall have the opportunity to inspect and operate the valve.
4. CLCJAWA will assess the ease of access to the operating nut and ease of operating the corporation stop.
5. If access and operation of the valve and its appurtenances meet CLCJAWA's criteria, then the valve will be accepted as installed.
6. The Combination Air Valve assembly shall be free from any leaks.

##### B. Non-Conforming Work

1. If access and operation of the valve or its appurtenances do not meet CLCJAWA's criteria, the Contractor will remedy the situation until it meets CLCJAWA's criteria.

#### *DELIVERY, STORAGE AND HANDLING*

Deliver materials to the site to ensure uninterrupted progress of the work.

Protect threads and seats from corrosion and damage. Rising stems and exposed stem valves shall be coated with a protective oil film which shall be maintained until time of use.

Furnish covers for all openings. All valves 3-in and larger shall be shipped and stored on site until time of use with wood or plywood covers on each valve end.

Store delivered equipment to permit easy access for inspection and identification. Any corrosion in evidence at the time of CLCJAWA acceptance shall be removed, or the valve shall be removed from the job.

Protect all parts such that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the units and equipment are ready for operation.

Protect all equipment and parts against any damage during a prolonged period at the site.

Protect the finished surfaces of all exposed flanges by wooden blank flanges, strongly built and securely bolted thereto.

Protect finished iron or steel surfaces not painted to prevent rust and corrosion.

Prevent plastic and similar brittle items from being directly exposed to sunlight or extremes in temperature.

**Installation:** This work shall be performed according to the following:

*INSTALLATION OF COMBINATION AIR VALVE ASSEMBLIES*

Install in accordance with manufacturer's recommendations and as shown on the Drawings.

Above ground and vault interior ductile iron piping and valves shall be painted in accordance with CLCJAWA requirements, unless otherwise stated in the Drawings.

**Basis of Payment:** This work will be paid for at the contract unit price each for *AIR RELEASE VALVE*.

**Z0068200 STEEL CASINGS 30"**

**Description:** This work will consist of furnishing all labor, equipment, materials and incidentals required for installation of steel casing pipe as shown on the Drawings and as specified herein.

This work shall include, but not be limited to the following: steel casing pipe, galvanized steel vent pipe, skids, steel straps, grout seals, coatings, and location signs as required, miscellaneous appurtenances.

**Materials:** The materials shall be as shown in the Drawings and as specified herein.

*STEEL CASING PIPE*

36" casing pipe shall have a minimum yield strength of 35,000 psi, have a 0.469-in minimum thickness when cathodically protected as shown on the Drawings, be designed to withstand Cooper's E-80 railroad loading where the casing pipe crosses under railroad tracks and conform to AWWA C200, ASTM A53, and AREMA Standards. Casing pipe shall be painted inside and outside with two coats bitumastic enamel coating paint in accordance with AWWA C203.

Field and shop welds of the casing pipes shall conform with the AWS Standards. Field welds shall be complete penetration, single-vee groove or single-bevel groove type joints.

*CASING INSULATORS/END SEALS*

Insulators shall be steel casing insulators with plastic skids as manufactured by Advance Products & Systems, Pipeline Seal and Insulator, or Topaz.

End seals shall be cement grout consisting of a mixture of about 1 part cement to 6 parts sand. The amount of cement may be increased or decreased as necessary and as permitted to provide good flowing characteristics.

*ANNULAR SPACE FILLER*

The annular space between the casing pipe and carrier pipe shall be filled with sand of such sizes that when dry, 100 percent by weight shall pass a No. 20 sieve and not over 5 percent by weight shall pass a No. 100 sieve.

**General:** Installation methods shall conform to the manufacturer's recommendations for the type of pipe being installed with the following exceptions:

- A. Excavation and Foundation. The applicable requirements of Article 550.04 shall govern the performance of this work.
- B. Backfilling. The applicable requirements of Article 550.07 shall govern the performance of this work except that backfilling shall not be done in freezing weather without written permission of the Engineer, and it shall not be made with frozen material. No backfill shall be made where the material already in the trench is frozen.

This work shall be performed according to the following:

- A. American Society for Testing and Materials (ASTM)
  - 1. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - 2. ASTM A139 - Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4-in and over).
- B. American Welding Society (AWS)
- C. American Water Works Association (AWWA)
  - 1. AWWA C200 - Steel Water Pipe – 6 in. and Larger
  - 2. AWWA C203 - Coal-Tar Protective Coatings and Linings for Steel Water Pipelines
- D. American Railway Engineering and Maintenance-of-Way Association (AREMA)
- E. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

### *SUBMITTALS*

Submit shop drawings and product data for review.

Submit a tabulated laying schedule which references stations and invert elevations as shown on the Drawings as well as all fittings, bends, outlets, joints, and specials, along with the manufacturer's drawings and specifications indicating complete details of all items. The laying schedule shall show casing pipe class, class coding, and station limits. The above shall be submitted to the Engineer for approval before manufacture and shipment. The location of all pipes shall conform to the locations indicated on the Drawings. Pipe shall not be supplied from inventory.

Submit anticipated production and delivery schedule.

All casing pipe to be installed under this Contract may be inspected at the site of manufacture for compliance with this Section by an independent laboratory selected by the CLCJAWA. The manufacturer's cooperation shall be required in these inspections. Any inspection requested by the CLCJAWA of all casing approved for this Contract, plus the cost of inspection of a reasonable amount of disapproved casing, will be borne by the CLCJAWA.

### *QUALITY ASSURANCE*

All pipe to be installed under this Contract may be inspected at the site of manufacture for compliance with this Section by an independent laboratory selected by the CLCJAWA. The manufacturer's cooperation shall be required in these inspections. Any inspection requested by the CLCJAWA of all pipe approved for this Contract, plus the cost of inspection of a reasonable amount of disapproved pipe, will be borne by the CLCJAWA.

Submit to the Engineer for approval, within 30 days after signing of the Contract, a listing, including materials to be furnished, the name of the suppliers, the date of delivery of materials to the job site and a time schedule for the completion of the project.

### *DELIVERY, STORAGE AND HANDLING*

Care shall be taken in loading, transporting and unloading to prevent injury to the pipe or coatings. Pipe shall not be dropped. All pipe shall be examined before laying and no piece shall be installed which is found to be defective. Any damage to the pipe coatings shall be repaired as directed by the Engineer.

**Installation:** This work shall be performed according to the following:

### *STEEL CASING PIPE INSTALLATION*

All pipe shall be subjected to a careful inspection prior to being installed. If the pipe fails to meet the specified requirements it shall be removed and replaced with a satisfactory replacement at no additional expense to the CLCJAWA.

The carrier pipes shall be supported within the casing pipes by skids so that the pipe bells do not rest directly on the casing. The load of the carrier pipes shall be distributed along the casing by the method of support as directed by the manufacturer.

Fill void between casing pipe and carrier pipe completely with sand in one continuous uninterrupted operation in a manner to prevent the occurrence of any voids between the casing pipe and the carrier pipe. Seal the ends of the pipe with 3 inches of grout.

Dewatering through the casing during construction will not be permitted. All dewatering methods shall be approved by the Engineer before work begins.

Complete record information shall be obtained prior to backfilling the work.

### *FILLING*

The pipe shall be installed to the exact line and grade required within the casing pipe, and, after it has been satisfactorily placed and approved by the Engineer, the space between the outside of the casing pipe and carrier pipe shall be completely filled with sand in one continuous uninterrupted operation in a manner to prevent occurrence of any voids between the casing pipe and carrier pipe.

Pipe to be installed within casings must be braced to sides and top of casing with skids as specified to prevent flotation or motion during the placing of sand.

**Method of Measurement:** Steel casing pipe of the various diameters will be measured for payment in place in feet.

**Basis of Payment:** This work will be paid at the contract unit price per foot for STEEL CASINGS 30", which price shall include casing insulators, end seals, annular space filler and all excavation, except excavation in rock.



## **PRESTRESSED CONCRETE CYLINDER PIPE AND FITTINGS**

**Description:** Furnish all labor, materials, equipment and incidentals required and install, make ready for operation, all prestressed concrete cylinder pipe including fittings, rubber gaskets, mortar for inside joints, and for outside joints of all pipe as shown on the drawings and as specified herein. The work shall include the testing of materials, pipe, and pipelines.

**Constraints & Sequencing:** The connection to existing water main will require a shutdown by CLCJAWA. The realigned water main must be constructed valve to valve before the connection to the existing water main may be scheduled. If the realigned water main construction is sequenced where the water main is not constructed valve to valve, a temporary plug shall be installed.

The Contractor shall provide CLCJAWA a minimum of 3 week notice of any scheduled connection to existing. Three meetings are required prior to the scheduled shutdown.

1. Meeting 1 – 1 week prior to shutdown
  - a. Location: Water Treatment Plant or Field Trailer
  - b. Required attendees include the general contractor, water main installation subcontractor, resident engineer, CLCJAWA and representatives of impacted communities.
  - c. Pressure testing, disinfection, and water quality sampling must be completed and proper documentation provided at the time the meeting is scheduled.
2. Meeting 2 – 1 day prior to shutdown
  - a. Location: Job Site
  - b. Required attendees include the general contractor, water main installation subcontractor, resident engineer, and CLCJAWA.
3. Meeting 3 – 1 hour prior to shutdown
  - a. Location: Job Site
  - b. Required attendees include the general contractor, water main installation subcontractor, resident engineer, and CLCJAWA.

A final meeting 1 hour prior to valve closure is required for final clearance by CLCJAWA. Connection to existing water main will not be permitted during peak flow months of May through September. Any connections to existing water main shall be executed from October 1<sup>st</sup> to April 30<sup>th</sup>.

For connection to existing water main, work commences when valves are closed to isolate the water main. The Contractor shall have 24 hours to complete his work. Completion of work is upon receipt of two acceptable bacteriological test results over 48 hour period and flushing of the water main.

**Liquidated Damages:** The Contractor shall pay CLCJAWA \$500 per hour beyond the 72 hour window provided to complete the work and restore the water main to service.

**Materials:** The materials shall be as shown in the Drawings and as specified herein.

### *PRESTRESSED CONCRETE CYLINDER PIPE*

Unless otherwise specified, the design materials and workmanship for pipe shall conform to the requirements of AWWA C301 and M9. Core and coating thickness for pipe shall be as specified in AWWA C301, AWWA C304, and AWWA M9. All materials furnished by the manufacturer shall be new and of the quality required.

Prestressed concrete cylinder pipe shall be fully restrained as manufactured by Hanson Pressure Pipe.

Pipe and fittings shall be designed in accordance with AWWA C304, using the design conditions noted below. These conditions shall also be used in designing fittings that include a reinforced concrete exterior coating of the steel cylinder.

1. External Loading
  - a. The earth load shall be taken as the greater of the following:
    - 1) Depth from existing ground level to top of pipe as shown on plans, or
    - 2) A minimum depth of 6-ft.
  - b. Earth loads (dead loads) shall be computed assuming the trench width to be that giving the maximum load on the pipe (transition width) for the following parameters:
    - 1) Soil Density = 120 lbs/ft<sup>3</sup>
    - 2)  $K_u' = 0.130$
  - c. Live loads shall be calculated as:
    - 1) Pipe in streets, AASHTO H-20 for two trucks passing
    - 2) Pipe within railroad right-of-way, AREA Coopers E-80.
    - 3) Both H-20 and E-80 load shall be completed in accordance with ACPA's "Concrete Pipe Design Manual" and "Concrete Pipe Handbook".
2. Internal Pressure (Pressure Pipe)
  - a. Design working pressure ( $P_w$ ) shall be 150 psi.
  - b. Internal Field Test Pressure ( $P_{ft}$ ) shall be 225 psi.

### *PIPE / FITTINGS / JOINTS*

Steel thickness of all fittings shall be designed with a maximum deflection of 2 percent of the internal diameter for the external loading condition specified in Paragraph 2.02 above. In addition, under the internal loading conditions described in Paragraph 2.02 above, the hoop stress shall not exceed 40 percent of the minimum yield stress of the steel at the design working pressure and 50 percent of the minimum yield stress of the steel at the field test pressure. The thickness shall be a determined by AWWA M9.

Fabrication of the fittings shall be according to AWWA C301 and AWWA M9.

Interior and exterior concrete/mortar coating shall be per AWWA 301.

The date of manufacture or a serial number traceable to the date of manufacture and the mark or trademark of the manufacturer shall be clearly marked by stencil with waterproof paint at end of the pipe barrel. The marking may be at the bell or spigot end of the pipe, as long as it is consistent. Pipe shall not be shipped until the compressive strength of the concrete is a minimum of 4,500 psi, or 7 days after manufacture, and/or repair, whichever is the longer. Unsatisfactory or damaged pipe will be either permanently rejected or returned for minor repairs. Pits, blisters, rough spots, minor breakage, and other imperfections may be repaired, subject to the approval of the Engineer, after demonstration by the manufacturer that strong and permanent repairs result. Repairs shall be carefully inspected before final approval. Cement mortar used for repairs shall have a minimum compressive strength of 3,000 psi at the end of 7 days and 4500 psi at the end of 28 days, when tested in cylinders stored in the standard manner. Epoxy mortar may be utilized for repairs subject to the approval of the Engineer. Major breakage or spalling from interior of pipe shall be reason for the rejection of pipe. Pipe may be repaired under unloaded conditions (removal of prestressing wire). New prestressing wire may be applied when the compressive strength as determined by cylinder testing equals or exceeds the strength required for prestressing as stated in AWWA C301.

Cement shall be Type I or II and shall be in accordance with ASTM C150.

The pipe core shall be manufactured by the centrifugal method, the vertical casting method or the radial compaction method.

Wire shall be a minimum of No. 6 gauge and shall meet the requirements of ASTM A648, Class III. Wire with class strength greater than Class III will not be permitted.

Steel cylinders shall be No. 16 gauge minimum and shall be hot rolled at point of origin.

Mortar coatings shall consist of one part Portland cement to a maximum of 2-1/2 parts fine aggregate, by weight. Rebound, not to exceed 1/4 of the total mix weight may be used, provided the rebound is treated as fine aggregate.

Bell and spigot joint rings shall be steel, self-centering type and otherwise as specified in AWWA C301.

The rubber gaskets shall be in accordance with AWWA C301 and shall be designed and manufactured so that the completed joint will withstand an internal water pressure in excess of the design pressure of the pipe itself without showing any leakage or displacement. The pipe

manufacturer shall provide facilities for testing the effectiveness of this joint against leakage and one such test may be made for each 500-ft of pipe manufactured. The manufacturer shall provide written notice to the Engineer of his/her intent to perform such tests; whereupon the Engineer will respond as to whether this testing will proceed. Such test shall be made by an internal pressure against the joint of at least the design pressure of the pipe.

Bell and spigot wall fittings shall be manufactured by the same manufacturer as the pipe, or engineered approved equal. Wall fittings shall be supplied with adequate bracing to keep them round and true during transportation and construction.

Restrained joints shall be the clamp type or snap ring type as manufactured by the same manufacturer as the pipe.

Testable joints installed as indicated on the drawings or as directed by the Engineer as manufactured by the same manufacturer as the pipe.

Radii for curved sections as specified on the Drawings may be produced by joint deflection up to 75 percent of that recommended by the manufacturer. Deflections required which are in excess of those recommendations shall be produced by beveling one or both ends of the pipe.

Bends shall be fabricated to the degree of curvature required.

Gasket materials such as polyethylene, asbestos cement, elastomer, and PVC (numerous others) are subject to permeation by lower molecular weight organic solvents and petroleum products. Careful material selection must be made when dealing with laying pipe through areas of possible contamination by these chemicals.

It is the responsibility of the Contractor to take precautions during the installation of the pipe in order to prevent floatation of the pipe.

No pipe shall be installed on a trench bottom that has frozen or at any time there is the danger of a frozen trench bottom occurring.

**General:** This work shall be performed according to Section 561 of the "Standard Specifications" and the following:

- A. American Water Works Association (AWWA)
  1. AWWA C200 - Steel Water Pipe - 6-in (150 mm) and Larger
  2. AWWA C301 - Prestressed Concrete Pressure Pipe, Steel-Cylinder Type
  3. AWWA C304 - Design of Prestressed Concrete Cylinder Pipe
  4. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances
  5. AWWA C651 - Disinfecting of Water Mains
  6. AWWA M9 - Concrete Pressure Pipe

7. AWWA M11 - Steel Pipe - A Guide for Design and Installation
- B. American Society for Testing and Materials (ASTM)
  1. ASTM A648 - Standard Specification for Steel Wire, Hard Drawn for Prestressing Concrete Pipe.
  2. ASTM C33 - Standard Specification for Concrete Aggregates.
  3. ASTM C150 - Standard Specification for Portland Cement.
  4. ASTM C497 - Standard Test Methods for Concrete Pipe, Manhole Sections or Tile.
- C. American Association of State Highway and Transportation Officials (AASHTO H-20).
- D. AREA Coopers E-80.
- E. American Concrete Pipe Association "Concrete Pipe Design Manual" and "Concrete Pipe Handbook".
- F. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

#### *SUBMITTALS*

Submit shop drawings showing all details of reinforcement, concrete and joint dimensions for all pipe and fittings. The locations of all pipes shall conform to the locations indicated on the drawings. Pipe shall not be supplied from inventory.

Submit anticipated production and delivery schedule.

#### Design Data

1. Submit applicable pipe design data in accordance with AWWA C301 and C304, including the following:
  - a. Type of Pipe
    - 1) Lined Cylinder
    - 2) Embedded Cylinder
  - b. Cylinder Data
    - 1) ASTM designation and grade
    - 2) Thickness and nominal diameter
    - 3) Test pressure
  - c. Prestressing Wire Data

- 1) ASTM designation and class
  - 2) Size
  - 3) Area
  - 4) Wire spacing
  - 5) Minimum ultimate strength
  - 6) Wrapping stress
- d. Concrete Data
- 1) Type of cement
  - 2) Concrete mixture proportions
  - 3) Minimum compressive strength at time of wrapping
  - 4) Minimum compressive strength at 28 days
  - 5) Core thickness
  - 6) Minimum coating thickness

Submit design calculations in accordance with AWWA C304, certified by a professional engineer licensed in the state(s) where installation will take place. Calculations shall include the burst pressure ( $P_b$ ) and maximum internal pressure ( $P_k$ ). Clearly indicate all calculation constants for this specific project.

#### Weld Data

1. Submit in accordance with AWWA standards, welder qualifications and welding procedure(s). See sections 4.6.2 and 4.6.3 in AWWA C301 for additional details on welder qualifications and welding procedure.

#### Test Reports

1. The manufacturer shall submit test reports during the manufacture of the pipe at the discretion of the Engineer. Test reports shall include the items specified by AWWA 301.
2. Field pressure/leakage tests.

#### Certificates

1. Prior to shipment of pipe, submit certified affidavit of compliance stating that the pipe for this Contract was manufactured, inspected and tested in accordance with the AWWA Standards specified herein.

## QUALITY ASSURANCE

### Qualifications

1. The materials specified herein are intended to be standard types of prestressed concrete cylinder pipe and fittings for use in transporting water under pressure.
2. All prestressed concrete cylinder pipe and fittings shall be furnished by a single reputable manufacturer with a minimum of 5 years of experience in manufacturing prestressed concrete cylinder pipe of the size(s) specified for this project. The pipe and fittings shall be manufactured for this project and installed in accordance with industry standards and methods and shall comply, in all respects, with requirements specified herein. The pipe and fittings shall also comply with the latest edition, at the time of bid, of all referenced standards and specifications.
3. The installing contractor must be able to demonstrate a minimum of 10,000 LF of PCCP experience for pipe sizes 16" diameter or greater. The Contractor shall submit a list of projects and references of previous PCCP installation jobs for verification of previous installation experience.

Inspection of the pipe and fittings may be made by the Engineer upon delivery at the site. The pipe shall be subject to rejection at any time on account of failure to meet any of the requirements specified herein, even though the pipe may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the job at once, unless otherwise specified by the Engineer.

Manufacturer is to provide the results of tests on concrete, mortar, steel, cylinder assembly, calibration of test equipment, and rubber gaskets from the lot of pipe the product is being taken. The testing shall have been conducted by an Independent Testing Laboratory per for conformance with AWWA M9, and provide signed certification of conformance along with copies of all reports, to the Engineer.

The Manufacturer shall provide from an independent certified laboratory certified Proof of Design Tests and all Shop Production Tests performed by the pipe manufacturer.

1. All certifications shall be signed by an officer of the Independent Testing Laboratory.

#### Proof of Design Tests

1. Conduct Proof of Design Tests at the manufacturer's plant for the lot of pipe product is being taken from.

#### Production Testing

1. In addition to the above proof of design tests, production testing on a minimum of one pipe length per 50 manufactured from the lot of pipe product is being taken from shall have been performed.
2. The production tests shall be as follows:
  - a. The Independent Testing Laboratory will randomly select one pipe out of each lot of 50 manufactured for the project.
  - b. The pipe shall be subjected to an internal pressure test.
  - c. The internal pressure of the pipe shall be increased to a pressure equal to  $P_w$  plus  $P_t$ , held for 1 minute, then reduced to  $P_w$ . After 5 minutes at  $P_w$ , there shall be no visible coating cracks along the prestressed portion of the pipe.
  - d. Pipe lengths passing the production in-plant testing may be shipped and installed in the project.
  - e. Should the pipe length fail to meet these requirements, two additional lengths of pipe from the same lot of 50 will be tested as specified herein. Should either of these pipes fail to pass this test, the entire lot of 50 shall be rejected.

#### *DELIVERY, STORAGE AND HANDLING*

Legibly mark all pipes, fittings, specials, and appurtenances to be consistent with laying schedule and marking drawings. Each pipe shall be identified with sequential numbering and each marked pipe will appear on marking drawings in the identified locations for installation. Special fittings, bends, and appurtenances requiring a specific orientation will be appropriately marked with the words "TOP" in the correct position and in a consistent location.

Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe or coatings. See also AWWA C301 and AWWA M9 for shipping, handling, and storage procedures. Pipe or fittings shall not be dropped. All pipe or fittings shall also be examined as



noted in Division 1. Any damage to linings or coatings discovered during examination shall be repaired to the satisfaction of the Engineer at the Contractor's cost before the pipe is installed. Pipe shall be transported from the final place of manufacturing to the jobsite on padded bunks or timbers with nylon tie-down straps or padded banding. Pipe shall not be stacked higher than the limits recommended by its manufacturer.

All pipe and fittings shall be thoroughly cleaned, and shall be kept clean until they are used in the work.

**Installation:** This work shall be performed according to Section 561 of the "Standard Specifications" and the following:

#### *INSPECTION OF EXISTING PIPE*

The Contractor shall make available the existing water main removed for inspection. The Contractor shall coordinate with CLCJAWA staff as to when the pipe will be available and not dispose of it until such inspection has been completed.

#### *GENERAL*

Care shall be taken during loading, transporting, and unloading to prevent damage to the pipes, fittings, or coatings. Pipe or fittings shall not be dropped. All pipe and fittings shall be thoroughly cleaned before laying, shall be kept clean until they are used in the work and

When pipe is laid it shall conform to the alignment and grade shown on the Drawings.

All pipe and fittings shall be subjected to a careful inspection for mortar coating disbonding and soundness testing by tapping with a hammer prior to installation.

If any defective pipe is discovered after it has been laid it shall be removed and replaced with a sound pipe in a satisfactory manner, as determined by the Engineer.

Regulate and control equipment and construction operations such that the loading on the pipe does not exceed the loads for which the pipe is designed and manufactured. Pipe found to have longitudinal cracks from construction equipment or other loading shall be removed and replaced with sound pipe and closures in a satisfactory manner, as determined by the Engineer.

The method of jointing the pipe shall be in strict accordance with the manufacturer's instructions. Arrange for the manufacturer to supervise the installation of at least the first three standard joints and the first restrained joint.

Shutdown for connecting to the existing water main will be limited to 36 hours.

#### *INSTALLING PRESTRESSED CONCRETE CYLINDER PIPE AND FITTINGS*

Prestressed concrete cylinder pipe and fittings shall be installed in accordance with requirements of AWWA M9, except as otherwise specified herein. A firm and even bearing throughout the length of the pipe shall be provided by digging bells holes at each joint and by tamping select fill at the side of the pipe to the springline. **BLOCKING WILL NOT BE PERMITTED.**

All prestressed concrete cylinder pipe shall have a minimum of 6-ft of cover. Pipe shall be laid such that the invert elevations shown on the Drawings are not exceeded.

The pipe interior shall be maintained dry and broom clean throughout the construction period.

Gasket, gasket groove and bell shall be cleaned and lubricated with a vegetable lubricant furnished by the pipe manufacturer. The lubricant shall be approved for use in potable water and shall be harmless to the gasket. Pipe shall be laid with bell ends looking ahead. If necessary, pipe may be laid with spigot ends looking ahead when approved by the Engineer. As soon as the spigot is centered in the groove of the previously laid pipe, it shall be fully engaged with approved automatic equipment. After the gasket is compressed, verify the position of the gasket with a feeler gauge provided by the pipe manufacturer.

Place a grout band approved by the pipe manufacturer around each exterior joint recess and fasten it in place with either wire or steel strapping stitched into its edges. Mix a 1:2 mortar grout of sufficient liquid consistency to flow easily and pour it into the joint recess beneath the grout band. To assist the flow and to assure complete filling of the entire recess completely around the pipe, agitate so all voids are filled. Close the joint recess at the top with a stiffer mix of the same mortar.

Pack interior joints of pipe 30-in in diameter and larger with mortar after backfilling is completed. Mortar grout shall be employed, consisting of 1 part by volume of Portland cement to 1-1/2 parts well graded coarse concrete sand meeting the requirements of ASTM C33 and sufficient water to make a stiff mortar suitable for overhead work. The mixture shall have a dry, crumbly consistency and shall be pushed into place and troweled to make a smooth joint. See page 225 in AWWA M9 for interior grouting of other sizes of pipe.

All pipe shall be sound and clean before laying. When laying is not in progress, including lunchtime, the open ends of the pipe shall be closed by watertight plug or other means approved by the engineer. Good alignment shall be preserved in laying. The deflections at joints shall not exceed 75 percent of that recommended by the manufacturers. Fittings, in addition to those shown on the drawings, shall be provided, if required, in crossing utilities which may be encountered upon opening the trench.

Have on hand a sufficient supply of assorted short pipe lengths, adaptors and any other fittings necessary to prevent delays in pipe laying.

Restrained joints shall be installed to the limits indicated on the drawings or as directed by the Engineer in accordance with applicable provisions of the above.

#### *TAPPING*

Tapping of any Prestressed Concrete Cylinder Pipe shall be in accordance with Chapter 16 of AWWA Manual M9.

#### *SURVEY OF INSTALLED PIPELINE AND APPURTENANCES*

The Contractor shall perform a survey of the installed pipeline prior to placing backfill to record the horizontal and vertical location of the installation. Data shall be collected in a manner compatible with Trimble Pathfinder (GPS) software. The following information shall be submitted.

1. Connection to Existing Pipe
  - a. Method of Connection
2. All Appurtenances: valves, air release/vacuum valves, vents, hydrants, valve boxes
  - a. Identify Appurtenance: type, size
3. Joints
  - a. Type
4. Fittings
  - a. Type

**Pressure Tests:** This work shall be performed according to Article 561.04 of the "Standard Specifications" and the following:

#### *JOINT TESTING*

Provide portable joint tester to test each joint as the pipe is being installed to identify rolled or pinched gaskets.

Submit proposed testing methods and equipment to the Engineer for approval.

Prepare pipe wall surfaces on each side of the joint as required. Each joint shall be pumped up to 10 psi and held for 20 seconds. Allowable losses shall not exceed 4 psi over the 20 second test.

#### *HYDROSTATIC AND LEAKAGE TESTS*

After installation, cleaning and disinfection, the pipe shall be tested for compliance. Furnish all necessary equipment and labor for the pressure test and leakage test on the pipelines.

Submit detailed test procedures and method for Engineer's review. In general, testing shall be conducted in accordance with AWWA M9.

Pressure pipelines shall be subjected to a hydrostatic pressure of 150 psig. Duration of pressure test shall not be less than 2 hours. The amount of leakage which will be permitted shall be in accordance with AWWA C600.

All leaks evident at the surface shall be repaired and leakage eliminated regardless of the total leakage as shown by test. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are complied with. Defective materials, pipes, valves and accessories shall be removed and replaced.

**Disinfection of Water Main:** This work shall be performed by the Contractor in accordance to Article 561.05 of the "Standard Specifications" with following exceptions:

Chlorination of the pipeline shall be required in accordance to Section 4.7.4 of AWWA C651 and arranged by the Contractor. Chlorine gas direct injection into the pipe is not permitted.

Discharge of chlorinated water shall comply with all Federal, State and local standards. Provide sodium bisulfite for dechlorination prior to discharge.

Operation of CLCJAWA isolation valves, blow-off hydrants, and air release valves for dewatering and flushing shall be restricted to CLCJAWA staff. The Contractor shall provide 48 hour notification to CLCJAWA prior to operation of any of CLCJAWA isolation valves, blow-off hydrants, and air release valves.

Bacteriological samples shall be taken by CLCJAWA staff upon completion of work.

**Method of Measurement:** Water main will be measured for payment in place in feet. Fittings will be measured for payment in place per each.

**Basis of Payment:** This work will be paid according to Article 561.07 of the "Standard Specifications" at the contract unit price per foot for PRESTRESSED CONCRETE CYLINDER PIPE (PCCP) 20" and shall include the pipe, installation, and testing. Fittings will be paid for at the contract unit price per each for PCCP 15 DEG BEND 20", PCCP 30 DEG BEND 20", PCCP 45 DEG BEND 20", PCCP 90 DEG BEND 20", AND PCCP CUSTOM FITTINGS 20" and shall include the fittings, installation, and testing.

## **VILLAGE OF GRAYSLAKE SPECIAL PROVISIONS**

### **SECTION 561 WATER SUPPLY SYSTEM**

Description: This work shall consist of furnishing and installing underground water mains and valves of the required material and dimensions complete with necessary fittings. All couplings and fittings shall be Mueller. All water mains and appurtenances shall be constructed, tested, and disinfected in accordance with Section 561 of the Standard Specifications for Road and Bridge Construction adopted January 1, 2012 and the requirements of the Standard Specifications for Water and Sewer Construction in Illinois, 2014, Seventh Edition. The Contractor shall furnish the specified materials per the Municipality details included in the plans.

The Contractor shall provide all labor, material and equipment required to furnish and install water mains and appurtenances, and all other improvements shown on the plans as required to perform the work and as specified herein.

This work shall also be done according to the specifications, Special Provisions and to the requirements of the construction permit of Illinois Environmental Protection Agency. The Engineer shall be responsible for obtaining the Illinois Environmental Protection Agency Permit to Construct and Operate.

The extent of water main work as shown shall include the following: Trench excavation, backfill and cleanup, pipe installation, valves and fittings, connecting to existing water main, cut offs and plugs if required, bedding, testing, shoring and bracing. Fittings such as bends and tees shall be included in the Contractors unit prices for water main. These items are called out on the drawings for engineering design but shall not be paid for separately.

All valve vaults or valve boxes on public lines shall be numbered and their locations tied to two (2) above ground, permanent structures. All water mains shall be identified by pipe diameter and material type. Each bend and tee shall be tied to two (2) above ground, permanent structures. The pipe shall be tied to a permanent structure at a minimum of 100' intervals. All water services shall be identified by pipe diameter, pipe material, and location of B-Box. The location of the B-Box shall be tied to two (2) above ground, permanent structures. An As-built water main profile shall be provided with top of pipe elevations at key locations (bends, pipe crossings, vaults, deflections, etc.) and depth below finished grade.

#### Existing Conditions:

The location of underground utilities shown on the drawings represents the best information of the OWNER. The Contractor shall determine the location of underground utilities and perform his work in a manner which will avoid damage.

Should unidentified or incorrectly located piping or other utilities be encountered during the performance of the work, the Contractor shall consult the Engineer immediately for instructions on how to proceed.

If existing utilities are to remain in place, the Contractor shall provide adequate means of protecting such utilities from any damage which may be caused by his construction operations. Contractor shall repair any such damage to the satisfaction of the Engineer at no additional cost to the OWNER.

If existing utilities are to be removed, they shall be demolished and completely removed from site. Contractor shall consult with the Engineer and Utility OWNER before any utility services are shut-off or disconnected.

### **WATER MAIN VERTICAL SEPARATION**

Whenever water mains must cross sanitary sewer services, storm drains or sanitary sewers, the bottom of the water main must be at least 18" above the top of the drain or sewer. This vertical separation shall be maintained for that portion of the water main located within 10' horizontally, of any sewer or drain crossed: said 10' to be measured as the normal distance from the exterior wall of the water main to the exterior wall of the drain or sewer.

Where conditions exist that the minimum vertical separation set forth in (A) cannot be maintained, or it is necessary for the water main to pass under a sewer or drain, the sewer should be laid with AWWA C151-65 Push-On Joint Ductile Iron Pipe (see XX008959 DUCTILE IRON WATER MAIN (SPECIAL) special provision) and the pipe should extend on each side of the crossing until the normal distance from the water main to the sewer or drain line is at least 10'.

In making such crossings, it is preferable to center a length of water main pipe over the sewer to be crossed so that the joints will be equidistant from the sewer and as remote therefore as possible. Where a water main must cross under a sewer, a vertical separation of main should be maintained, along with means to support the larger sized sewer lines to prevent their settling and breaking the water main.

### **WATER MAIN TESTING**

Contractor shall submit a testing schedule and procedure to Engineer for review three days prior to initiating testing program. Submittal shall include type of equipment and location of its connection to new system. Testing shall be included in the bid items and shall be considered included in the cost of performing the work.

Testing. Pressure and leakage tests shall be conducted at a minimum of one hundred fifty (150) psi for one to six hours for each test. The length of the test will be determined by the village engineer at the time of construction. Testing shall be in accordance with the Standard Specification Reference Manual in Illinois, latest edition.

Testing shall be in accordance with ANSI/AWWA C600-93, and shall also comply with local and IEPA rules and regulations.

#### **TESTS REQUIRED:**

- All new water main work shall be tested for pressure and leakage.
- Contractor shall notify Engineer and Utility Owner 48 hours prior to initiation of testing.
- Contractor shall not perform any testing without Engineer and Utility Owner present.
- Chlorination testing shall be done in accordance with the requirements of the Standard Specifications for Water and Sewer Construction in Illinois, 2014, Seventh Edition.
- New water main shall not be connected to an existing main until after safe water samples have been obtained from new water main system addition.

- Where a new main is to be connected to an existing main, the following method shall be used prior to performance of a pressure/leakage test of new main.
  1. New main may be connected to existing water main with a valved connection. Said connection valve shall be shut tight and locked by Utility Owner to prevent a completed connection between existing and new sections of water main. Upon completion, new main shall be filled and disinfected. Upon receipt of safe water samples, new main shall be pressure and leakage tested.
- Initial filling and flushing of water mains shall be done with Municipal personal present.
- Chlorination of water mains shall be done by certified chlorination firms approved by the Municipality.
- Bacteriological testing following disinfection shall be done either by the Municipality or other IEPA certified laboratory with original sample sheets supplied. In the event one or more of the sampling tests are unsatisfactory the Municipality retains the right to take over the sampling process.

**PRESSURE TESTING:**

Pressure testing shall be done in accordance with the requirements of the Standard Specifications for Water and Sewer Construction in Illinois, 2014, Seventh Edition.

**56400500 FIRE HYDRANTS TO BE REMOVED**

This item shall consist of the removal and disposal of the hydrants where indicated on the plans. The Village will maintain ownership of hydrants. The Village of Grayslake shall be notified when removed and shall be coordinated for pickup.

This work will be measured for in payment as EACH.

Work shall be paid for as FIRE HYDRANTS TO BE REMOVED.



**56400710 FIRE HYDRANT AND VALVE (SPECIAL)**

Fire hydrants installed as part of the Village of Grayslake water system improvements shall be Traverse City manufacture, with auxiliary valves and boxes (vaults excepted). A minimum earth cover of five feet six inches (5'6") over the top water mains and services shall be provided. All fire hydrants will be painted yellow with exact paint type and hue to be approved by the Resident Engineer or the owner of the water main. In no case shall fire hydrant spacing exceed three hundred fifty (350) feet. Fire hydrants shall be so placed that they are accessible at all times. All fire hydrants shall have national standard threads. Fire hydrants shall have a five-inch valve opening and two (2)-two-and-one-half-inch (2-1/2") connections and a four-and-one-half-inch (4-1/2") connection. All valves and fire hydrants shall open counter-clockwise.

This work will be measured for in payment as EACH.

Work shall be paid for as FIRE HYDRANT AND VALVE (SPECIAL)

**60248900 VALVE VAULTS, TYPE A, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID**

The completed design and materials shall be in accordance with SSWSMCI, Division IV, Section 44 with the following exceptions:

1. Valve vaults shall be provided for all water main valves 8" and larger.
2. Construction must use precast concrete. Concrete masonry units, concrete brick and clay brick will not be allowed.
3. Unless otherwise required by the Illinois Department of Transportation Standards in IDOT right of way, valve vault frames must be Neenah R-1772, EJIW 1022Z1, with frame inside diameter of 23", height of 7", flange diameter 34". Lids shall be Neenah R-1772, EJIW 1020A, with 22-3/4" outside diameter, 1-3/4" high with a minimum load capacity of 48,000 lbs. Lid shall be stamped "Water" and be provided with T-seal and concealed pickhole.
4. Valve vaults shall be provided with a maximum two (2) adjusting rings no less than two inch (2") high and no more than a total of ten inches (10") high. Chimney seals to be installed per the details in the drawings.
5. For water distribution system valves six inches (6") and smaller, valve boxes may be supplied as an alternate to valve vaults. Valve boxes shall be Tyler 3 piece or equal and shall have a full cast or ductile iron body with rubber valve box stabilizers. Valve box covers shall be labeled "Water".

Unit price for each vault shall include full compensation for cost of furnishing and installing vaults with concentric cone, including concrete work, masonry work, corporation stops; specified manhole frame and cover; masonry blocking, excavation, hauling, and disposal of excess material; designated backfill; 4" bedding material; compaction; temporary restoration of disturbed area, but not including permanent restoration, cleanup and work incidental to valve vault installation not specifically included for payment under other unit prices. Designated backfill and work incidental to vault installation shall be a component of the unit price cost for VALVE VAULTS, TYPE A, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID. Casting should be per the detail included in the plans. Number of valve vaults measured shall be equal to actual number of valve vaults furnished and installed.

This work will be measured for in payment as EACH.

The work shall be paid for at the contract unit price per EACH for VALVE VAULTS, TYPE A, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID.

**X0327367 STEEL CASING PIPE, BORED AND JACKED, 24"**

Work includes furnishing and installing steel casing pipe to be bored under railroad and Washington Street at Sta. 110+00 and 123+51 as shown on the plans. The pipe shall meet at a minimum the requirements set forth in the general notes and details of the engineering plans. Minimum casing pipe thickness shall be 0.375". The bore and receive pits shall be constructed in a safe manner and protected during the bore process. The excavations shall meet OSHA requirements. The cost for the excavation and backfill of the pits shall be incidental to the price for this item. This pay item does not include any materials except for the welded steel pipe.

This work will be measured for in payment as FOOT.

Work shall be paid for as STEEL CASING PIPE, BORED AND JACKED, 24".

**X0327651 WATER MAIN IN CASING, 12”**

Work includes furnishing and installing pipe and all necessary equipment, fittings (in accordance with AWWA C110), joint restraints and materials to install water main in the proposed STEEL CASING PIPE, 24” DIAMETER. This will include casing spacers, pushing pipe and installing granular material into the casing pipe once installed. Water main shall be Class 52 ductile iron water main (in accordance with AWWA C151-65) with mechanically restrained joints (in conformance with AWWA C111) to allow for pullback of the main. Work shall be conducted according to the Standard Specifications for Water and Sewer Construction, 2009 edition and per the details in the engineering plans.

This work will be measured for in payment as FOOT.

Work shall be paid as WATER MAIN IN CASING, 12”.

**X0327720 12" DUCTILE IRON FITTINGS**

Work shall include isolating existing water mains with either linestops or freezing to cut a minimum of ten (10) feet of the main adjacent to the isolation to facilitate installation of a 45 degree bend. Once the bend is mechanically restrained and thrust blocked, isolation technique shall be removed.

This work will be measured for payment in place per EACH.

Work shall be paid as 12" DUCTILE IRON FITTINGS.

**X5610649 PLUG WATER MAIN 12"**

Work shall include isolating existing water mains with either linestops or freezing to cut a minimum of ten (10) feet of the main adjacent to the isolation to facilitate installation of a plug. Once the plug is mechanically restrained and thrust blocked, isolation technique shall be removed.

This work will be measured for payment in place per EACH.

Work shall be paid as PLUG WATER MAIN 12".

**X5610712 WATER MAIN REMOVAL, 12”**

Description. Work shall include the removal of existing water main after the proposed main is in service and accepted. All removals shall be discussed with the Municipality prior to the work and the Municipality shall be notified 24 hours prior to abandonment. This work also includes backfilling the trench where the water main was removed, unless grading operations dictate otherwise.

Method of Measurement. This work will be measured for payment per FOOT of water main removed.

Basis of Payment. Work shall be paid as WATER MAIN REMOVAL, 12”.

**X5630012 CUT AND CAP EXISTING 12" WATER MAIN**

Work includes the cutting and removal of twenty feet of existing 12" water main in areas indicated on the plans to facilitate a water tight existing main after the proposed water main is approved. Non shrink grout shall be pumped into the end of the water main being abandoned for at least ten (10) feet. After grout is installed, a plug of like size shall be installed to the main which is being abandoned in place. Valve closures (by the Municipality) are also included in this pay item.

This work will be measured for in payment as EACH.

Work shall be paid as CUT AND CAP EXISTING 12" WATER MAIN, and shall include cutting and removal of water main, furnishing and placing non shrink grout, furnishing and placing plugs, and valve closures.



**X6026622 VALVE VAULTS TO BE REMOVED**

Description. This work shall consist of the removal of existing valve vaults at the locations shown on the plans and as directed by the Engineer. All work shall conform to Section 605 with the addition that the existing watermain shall be cut on both sides of the valve vault to facilitate removal of entire structure. Existing pipe ends shall be grouted.

Basis of Payment. This work shall be paid for at the contract unit price each for VALVE VAULTS TO BE REMOVED, regardless of size.

**XX003032 GATE VALVES, 12"**

Gate Valves, 12" design and materials shall be in accordance with SSWSMCI, Division IV, Section 42.

Gate valve, with the exception of hydrant valves, shall be located in valve vaults. The valve shall be Traverse City manufacture.

This work will be measured for in payment as EACH.

Work shall be paid as GATE VALVES, 12".

**XX006253 SANITARY MANHOLE, 4'-DIAMETER**

Description. This work consists of constructing new sanitary manholes where shown on the plans or specified by the Engineer as indicated on the LCPW "Standard Manhole Detail" included in the plans.

Basis of Payment. This work shall be paid for at the contract unit price per each for SANITARY MANHOLE, of the diameter specified; which price shall include the frame and grate or frame and lid specified.

**XX008959 DUCTILE IRON WATER MAIN (SPECIAL)**

Work includes furnishing and installing pipe and all necessary equipment, fittings (in accordance with AWWA C110), joint restraints and materials. Water main shall be Class 52 ductile iron water main (in accordance with AWWA C151-65) with mechanical or push-on joints (in conformance with AWWA C111). Work shall be conducted according to the Standard Specifications for Water and Sewer Construction, 2009 edition.

This work will be measured for in payment as FOOT.

Work shall be paid as DUCTILE IRON WATER MAIN (SPECIAL) of the size shown on the plans.

**Z0045100 PRESSURE CONNECTION 12" X 12"**

Tapping Valve and Sleeve 12" x 12" and associated pressure connection should be installed as specified in the Municipality's detail. Construction and materials are to follow the Municipality's detail as specified by the engineer. The detail is included in the project plans.

This work will be measured for in payment as EACH, and shall include furnishing and installing the tapping valve and sleeve.

Work shall be paid as PRESSURE CONNECTION 12" X 12".

**Z0056900 SANITARY SEWER 8"**

Description. This work consists of constructing new sanitary sewers where shown on the plans or specified by the Engineer.

Basis of Payment. This work shall be paid for at the contract unit price per foot for SANITARY SEWER 8"; which price shall include connecting to sanitary lift stations or manholes.

Where required by Article 208.01 of the Standard Specifications, trench backfill will be paid for according to Article 208.04.

**Z0067600 STEEL CASINGS 18”**

Description. Where indicated on the Plans sanitary, storm and water utility pipes shall be installed in a watertight casing pipe that has been augered and jacked in place. This work shall be performed in accordance with the detail provided in the Plans and as directed by the Engineer.

Methods and Materials.

Casing pipe – Steel Pipe - ASTM A139, Grade B, minimum yield strength 35,000 psi, minimum wall thickness 0.375 inch with welded joints. All pipe shall be coated inside and out with at least one shop coat of an approved primer paint. In addition the external surface shall be treated with one coat of coal tar epoxy or asphaltum paint. The full circumference of any joints shall be welded such that the casing pipe is continuous

Casing spacers - The utility (carrier) pipe shall be inserted into and supported within the casing pipe by the use of casing spacers. Spacers shall have a stainless steel shell with PVC lining, stainless steel bolts, and ultra high molecular weight polymer runners. Spacers shall be configured to provide restraint against utility pipe movement due to flotation. Spacer interval shall be as recommended by the manufacturer.

Self-restraining casing spacers - Additionally force mains and water mains shall be installed with self-restraining casing spacers that provide axial thrust restraint to prevent pipe joint separation. Restrained casing spacers shall be provided at all pipe joints.

Void space fill - The void space between the casing pipe and the utility (carrier) pipe shall be filled with sand or other approved material.

End seals - Ends of the casing pipe shall be sealed with rubber end seals secured in place with stainless steel bands.

Jacking and receiving pits shall be located so as to avoid conflicts with existing utilities.

The casing pipe shall be installed using equipment that encases the hole as the earth is removed. Augering without the concurrent installation of a casing pipe will be not permitted. All joints in casing pipe shall be continuously welded. The casing pipe shall extend the entire length indicated on the plans and be installed in a manner that will not disrupt traffic nor surface grades and facilities. The introduction of water as an excavator is prohibited.

The shoring with the augering/jacking pits shall be designed, erected, supported, braced, and maintained such that it will safely support all vertical and lateral loads that may be imposed on them during construction.

All work shall otherwise conform to the applicable Articles of Sections 550 and 552.

Basis of Payment. This work will be paid for at the contract unit price per foot for STEEL CASINGS 18”. All excavation and disposal, shoring design, construction, and removal, trench backfill, carrier pipe installation, casing spacers, void space fill, end seals, and all other materials, equipment and labor necessary to complete this work will be included in this price.

The carrier pipe will be paid for under the applicable pay item for that type of pipe. Trench backfill, where required, will be paid for according to Article 208.04.

# Standards for Water and Sewer Main Construction in Lake County Public Works Service Areas

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## 1. INTRODUCTION

### 1.01 Intended Use

Standards for Water and Sewer Main Construction in Lake County Public Works Service Areas ("This Standard") establishes the guidelines for the design and construction of water and wastewater utilities in the Lake County Department of Public Works ("LCPW") Service Area. This Standard provides technical information to engineers, developers, builders, contractors, construction supervisors, and any other persons or organizations with interests in the construction, operation, and maintenance of water and sewage facilities in LCPW Service Areas.

A general map of LCPW Service Areas is available from LCPW. Questions regarding service to specific properties should be addressed to LCPW.

### 1.02 Purpose

The purpose of This Standard is

- To help assure the long term service life and cost efficiency of the water and sewer system infrastructure assets in LCPW Service Areas by specifying system and component designs and materials to be used in completed water and sewer systems.
- To reduce maintenance costs through component standardization.
- To make current LCPW standards readily available for efficient use by design and construction professionals serving Lake County and to provide for the orderly adoption of future revisions to these standards.

It **is not** the purpose of This Standard:

- To imply adoption of the construction means, methods (other than final system acceptance testing), or commercial contractual obligation of parties constructing water and sewer facilities as described in the Standard Specifications for Water and Sewer Main Construction in Illinois, Fifth Edition, May, 1996 ("SSWSMCI"), or any other industry standard referenced in this document. Construction means, methods, and commercial contractual obligations of water and sewer construction projects are outside the scope of This Standard.
- To supercede the authority of municipalities or other government agencies where more restrictive local standards have been adopted by ordinance.

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1.03 Authority

These Standards have been developed pursuant to

1. The statutory authority conferred by 55 ILCS Division 5-15.
2. The Ordinance establishing a Cross Connection Control Program for the Public Water Supply Systems of the County, March 14, 1995.

## 2. HOW TO USE THIS STANDARD

1. Be sure your copy of This Standard is current. Parts of This Standard will be updated on a periodic basis. You may request a copy of the current Table of Contents listing current revisions of all sections by fax or email from LCPW. If you need an up to date section you may request that section at any time. You may also visit the LCPW website and download the most up to date standard in Adobe PDF format.
2. Refer to the appropriate section of This Standard for type(s) of construction activity planned by your client or organization. In most cases, Lake County Public Works has adopted the technical requirements of the SSWSMCI and the IRSSW.
3. Obtain copies or appropriate excerpts of standards (such as SSWSMCI) cited throughout This Standard.
4. Where LCPW has more restrictive requirements than SSWSMCI, those requirements are organized by reference to the related SSWSMCI section.
5. Whenever equipment or material is identified in This Standard by reference to a manufacture's brand, trade name, catalogue number, or similar notation, it is intended to identify the LCPW design standard. Any substitution request must be submitted in writing and approved by the LCPW Engineering Supervisor. LCPW reserves the right to determine what equipment or material is acceptable.
6. Be certain both LCPW and other referenced standards are included in construction contract documents in a manner to assure compliance by the installing contractor.

### 3. GENERAL REQUIREMENTS

#### 3.01 Definitions

Assurance – A financial guarantee to ensure that all improvements, facilities, or work required by the project plans and specifications will be completed, restored, or maintained.

Final Acceptance – Following final approval, and upon receipt of satisfactory record documents, maintenance assurance, and bill of sale from the permittee.

Final Approval – Completion, inspection, and approval of all required sewer and water improvements by the permittee and approved in writing by the LCPW Director.

Improvements – Infrastructure installation, construction, or rehabilitation required by the project plans and specifications.

Permittee – The person or organization granted the Permit to Construct water and/or sewer facilities by the Illinois EPA, his authorized agents or assigns. In the case where IEPA permits are not required the property owner, building owner, developer, or contractor responsible for the water and/or sewer service connection permit.

Service Area – LCPW Service Areas include those areas where LCPW provides water or sewer collection, transmission, and/or treatment services.

#### 3.02 Engineering Review and Permitting

Please refer to the “Permit Process” section of the Appendix for details of the engineering review and permitting process.

#### 3.03 Inspection

1. The Permittee shall notify LCPW at least two (2) working days prior to the start of water and/or sewer construction at 1-847-377-7500.
2. LCPW shall be granted access to all parts of the construction site and shall have the authority to inspect, approve, and/or reject all water main, water service, sanitary sewer and sanitary service improvements.

#### 3.04 Assurances

The Permittee shall provide the following assurances:

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1. For water service and/or sewer service construction: Contractor's License and Permit Bond in the minimum amount of \$5,000.
2. For water main and/or sanitary sewer construction: An Irrevocable Letter of Credit in the format and amounts as stipulated by LCPW, normally 130% of construction cost. Contact LCPW for an approved form.
3. Minimum one (1) year Maintenance Assurance following written Final Approval in the form of an irrevocable Letter of Credit in the format and the amounts as stipulated by LCPW. Normally the amount is 15% of the construction cost, or \$5,000, whichever is greater. The Maintenance Assurance shall be submitted prior to Final Acceptance.

3.05 CONSTRUCTION AND RECORD DOCUMENTS

A. General

1. Provide three (3) paper sets of construction drawings prior to the start of work to use as reference drawings during construction.
2. Provide three (3) paper sets of Record Documents to LCPW for review and approval following the completion of all public improvements and at least 2 months prior to final acceptance. Drawings must be sealed by a Professional Engineer or Land Surveyor Registered in the State of Illinois. If corrections are found to be necessary three (3) revised sets shall be submitted for approval. As an alternative, when project drawings have been created using CAD, approved record drawing files shall be submitted in either ArcGIS (preferred), Microstation, or AutoCAD format with one paper copy. Under either circumstance, an Adobe PDF of the Record Documents shall be included.
3. Construction assurances will not be released until the permittee achieves Final Acceptance.
4. Submitted drawings shall be no smaller than 17" x 24" or larger than 24" x 36" The scale shall be 1" = 50' or greater. State Plane Coordinates, Eastern Zone, NAD 83 NSRS2007, with minimum sub foot accuracy, shall be provided for at least three permanent structures shown on each drawing.
5. Permanent structures may be building corners, hydrants, street lights, etc. Property corners or building line extensions are not suitable references where location ties to permanent structures are required.
6. All easements must be recorded and shown on the record drawings, complete with dimensions.
7. The As-Built Plans shall include any and all field changes and shall include the information specified in this section.

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8. State Plane Coordinates, Eastern Zone, NAD 83 NSRS2007, with minimum sub foot accuracy, may be used in lieu of locating from two (2) above ground, permanent structures.
- B. Sanitary Sewer Improvements
1. All Manholes shall be numbered with corrected rim and invert elevations provided and shall be located from two (2) above ground, permanent structures.
  2. All pipes shall include lineal footage between center of manholes, diameter of pipe, material type, and corrected slope.
  3. All sewer services shall be identified by stationing from the nearest downstream manhole. Information required includes lineal footage of lateral, length of riser, pipe diameter, and pipe material. The upstream end of all non-connected sewer stubs shall be located from two (2) above ground, permanent structures and have the depth of the stub identified.
- C. Water Main Improvements
1. All valve vaults or valve boxes on public lines shall be numbered and their locations tied to two (2) above ground, permanent structures.
  2. All water mains shall be identified by pipe diameter and material type. Each bend and tee shall be tied to two (2) above ground, permanent structures. The pipe shall be tied to a permanent structure at a minimum of 100' intervals.
  3. All water services shall be identified by pipe diameter, pipe material, and location of B-Box. The location of the B-Box shall be tied to two (2) above ground, permanent structures.
  4. An As-built water main profile shall be provided with top of pipe elevations at key locations (bends, pipe crossings, vaults, deflections, etc.) and depth below finished grade.

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D. Other Appurtenant Improvements

1. Wells, Well Houses, and Lift Stations shall be identified on a plat of survey and a detailed site plan. Structural, mechanical, and electrical details shall also be provided.
2. All Lift Station inverts and discharge elevations shall be provided.
3. All force mains shall include lineal footage, pipe diameter, pipe material, discharge elevations, and force main routing.
4. All force main air-release and shutoff valves shall have locations tied to two (2) above ground, permanent structures.
5. Lift Station electrical system and instrumentation system record drawings shall be provided.

3.06 Construction Water Use

1. DO NOT OPERATE ANY PUBLIC WATER MAIN VALVE IN ANY OF THE LCPW WATER SYSTEMS. Only LCPW personnel are authorized to operate mainline valves.
2. A water use permit from LCPW is required for all construction and irrigation water use. There are two basic permit types available:
  - Metered construction water use permit – This permit may be used for all water needs, including landscaping irrigation, on a construction site.
  - Unmetered construction water use permit – This permit is valid *only* for water uses specifically related to building construction activities (e.g. masonry) on a construction site. The permit is not valid for landscaping irrigation.
3. Unless specifically stated otherwise in the water use permit, a reduced pressure zone backflow preventer (“RPZ”) meeting ASSE 1013 or AWWA C506 provided by LCPW must be used at all fire hydrant, service, or other public water supply connections where metered construction water is supplied.
4. Notify LCPW 24 hours before initial use of water for any purpose.

#### 4. TECHNICAL REQUIREMENTS

##### 4.01 Excavation, Backfill, and Cleanup

###### A. Excavation and Backfill for Underground Sanitary Sewers and Water Mains

Completed design and materials in accordance with SSWSMCI, Division II, Section 20 with the following exceptions:

1. Unless specifically approved by LCPW, bedding and haunching material to 12" above the crown of the pipe shall be clean crushed rock or crushed concrete with particle size and distribution within the range of CA12 to CA16 or FA6 to FA9. No angular rock over 0.75" shall be allowed. Where piping will be within 2 feet of a pavement edge, FA6 material shall be used for all subsequent trench backfill. In all cases, these materials shall be installed in accordance with the latest edition of IDOT Standard Specifications for Road and Bridge Construction, Section 550.07 Backfilling.
2. Only crushed limestone or crushed concrete will be allowed for ductile iron piping bedding and haunching.
3. Bedding and haunching materials must be placed and compacted from 4" below the pipe to at least the springline of the pipe. In no case shall angular rock greater than 0.75" be allowed to contact the pipe.

###### B. Restoration of Surfaces

Completed design and materials in accordance with SSWSMCI, Division II, Section 21 with the following exceptions:

1. Acceptable grass seed mixtures shall be limited to Type 2A Salt Tolerant Roadside Mixture for those areas adjacent to roadways and Type 1A Salt Tolerant Lawn Mixture for areas extending over 15 feet beyond roadways.
2. A minimum of 2" of black dirt shall be placed prior to tilling in areas to receive grass seed to provide an appropriate seed bed.
3. Areas where the initial seeding has failed to provide a dense uniform coverage of grass shall be re-tilled and reseeding performed using excelsior or other similar materials to ensure proper seed germination, growth, and protection from sun, wind, rain, and other environmental conditions which may have caused the initial seeding failure.



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4.02 Sanitary Sewers

A. General

1. Engineering drawings submitted for review shall include lineal footage between center of manholes, diameter of pipe, material type, and slope for all pipes.
2. All metal fittings and fasteners shall be stainless steel. Fasteners shall be type 304, austenitic, stainless steel installed with anti-seize coating (TS Moly-Lubricants, Houston, TX, TS-74).
3. Before final approval of any force main, there will be a LCPW monitored tracer wire continuity test in order to confirm proper installation of any tracer wire.

B. Pipe Materials for Sewers

Completed design and materials in accordance with SSWSMCI, Division III, Section 30 with the following exceptions:

Pipe and fitting materials approved for installation shall be limited to the following:

1. Polyvinyl Chloride (PVC) with minimum SDR 26 conforming to ASTM 3034 with push-on gasketed joints conforming to ASTM D 3212 for sewers.
2. Ductile iron pipe conforming to ASA A21.5 (AWWA C1151) will be allowed only when necessary due to load requirements as determined by the engineer and approved by LCPW. Ductile iron pipe shall have an approved biogenic corrosion resistant liner, Protecto 401, and otherwise meet ANSI A 21.4 (AWWA C-104). Class thickness shall be minimum Class 52 and designed per ANSI A 21.50 (AWWA C-150). Pipe shall have push-on joints per ASA A21.11. Corrosion control shall be provided using polyethylene wrapping per ANSI/AWWA C105/A21.5.
3. Reinforced Concrete Pipe (RCP, limited to diameters 18 inches and larger) conforming to ASTM C76. Pipe shall be provided with an approved cementitious sulfide resistant lining.
4. High Density Polyethylene (HDPE) meeting the applicable requirements of ASTM P-714 "Polyethylene (PE) Plastic Pipe (SDR-PR) Based on outside Diameter" and ASTM D-1248 "Polyethylene Plastic Molding and Extrusion Materials" Type IV, Class C. Pipe shall be Ductile Iron Pipe Size (DIPS). All pipe shall be made of virgin material. The pipe shall be homogenous throughout and shall be free of visible cracks, holes, foreign material, blisters, or other deleterious faults. Pipe shall have a minimum wall thickness corresponding to an SDR of 17.
5. All fusion joints shall meet the minimum requirements of the manufacture for cool-down time and all other fusing requirements. HDPE pipe shall be provided with necessary restraints and/or fittings to guarantee the pipe will not separate from the manholes at either end as might be caused by thermal expansion or contraction. Any such restraint or fitting shall use full circumference clamping and be approved for use by the pipe manufacturer. All fittings shall be

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specifically designed and pre-approved for use with HDPE pipe and installed in strict conformance with the manufacturer's instructions.

6. Where water main class pressure pipe is required this pipe shall be ductile iron pipe as specified above or polyvinyl chloride (PVC) with minimum SDR 21 and conforming to AWWA C-900 or C-909 Class 150. PVC pipe shall have push-on joints, utilizing an integral bell and stainless steel reinforced gasket, complying with ASTM D-3139 PVC. The compound shall meet requirements of ASTM C-1784.
7. Pipe size and material may not be changed between manholes unless necessary to meet requirements for water main class pipe. In this case, no shear mission couplings will be required to join dissimilar materials.
8. Flanged joints are required for all connections to pumps, valves, and other serviceable pipeline appurtenances.

C. Pipe Laying, Jointing, and Testing

Completed design and materials in accordance with SSWSMCI, Division III, Section 31 with the following exceptions.

1. All sanitary sewers shall be cleaned and televised following completion of all adjacent utilities installed using trenchless methods (e.g. horizontal directional drilling) prior to acceptance by the County.

D. Manholes for Sanitary Sewers

Completed design and materials in accordance with SSWSMCI, Division III, Section 32 with the following exceptions:

1. Manhole construction must use precast or formed in place reinforced concrete. Concrete masonry units, concrete brick, and clay brick will not be allowed.
2. Force main discharge manholes, drop manholes, and manholes adjacent to force main discharge manholes shall be spray lined with a minimum 1" of hydrogen sulfide resistant cementitious mortar, Strong Corporation Strongseal or Kerneos SewperCoat. Coating shall be applied in strict conformance with manufacturer's written procedures.
3. Unless otherwise required by the Illinois Department of Transportation Standards in IDOT right of way, manhole frames must be Neenah R-1772 or EJIW 1022Z1, with frame inside diameter of 23", height of 7", flange diameter 34". Lids shall be Neenah R-1772 or EJIW 1020A gasket seal with 22-3/4" outside diameter, 1-3/4" high with a minimum load capacity of 48,000 lbs. Lid shall be stamped "Sanitary" and be provided with T-seal and concealed pickhole.
4. All sanitary sewer manholes must be provided with a Cretex external chimney

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seal, Sealing Systems Infi-shield External Seal, or an Adaptor, Inc. Internal/External(2 in 1) manhole chimney seal all with stainless steel bands. Where special manhole configurations prevent the use of the above seals, Canusa wrap will be considered for use.

5. Manhole stairs shall be steel reinforced polypropylene, 14" minimum width, M.A. Industries model PS2-PF. Steps shall be placed on nominal 14" centers.
6. Manholes shall be provided with adjusting rings no less than two inch (2") and no more than a total of ten inches (10").
7. Manhole frames just as all other mating surfaces (e.g. ring to ring, ring to corbel) shall be sealed with an approved mastic.
8. Where flat top manholes are used the covers must have precast corbels for attachment of external chimney seals.

E. Sewer Services

Completed design and materials in accordance with SSWSMCI, Division III, Section 34 with the following exceptions:

Pipe Materials approved for installation shall be limited to the following:

1. Pressure rated solvent weld or pressure rated gasketed PVC, CPVC, or PVCO pipe, schedule 40, or a minimum 100 psi pressure class pipe with a minimum wall thickness corresponding to an SDR of 26 meeting the following standards:

Item	Type	ASTM	AWWA
Pipe	PVC	D1785 or D2241	C900
Pipe	CPVC	F441	C905
Pipe	PVCO		C909
Pressure Joints	Solvent weld	D2564 and F656	
Pressure Joints	elastomeric seals	D3139 and F477	

(Note: PVC Schedule 40 has SDR<26 for sizes up to 6" diameters)

2. Ductile iron pipe conforming to ASA A21.51 (AWWA C1151) with an approved biogenic corrosion resistant liner, Protecto 401, and otherwise meeting ANSI A 21.4 (AWWA C-104). Wall thickness shall correspond to a minimum Class 52 designed per ANSI A 21.50 (AWWA C-150). Pipe shall have push-on joints per ASA/AWWA C111/A21.11. Corrosion control shall be provided using polyethylene wrapping per ANSI/AWWA C105/A21.5.
3. High Density Polyethylene (HDPE) meeting the applicable requirements of ASTM D-2239, D-3035, and AWWA C-906. Pipe shall have a have a minimum pressure rating of 100 psi and minimum wall thickness corresponding to DR17 for PE3408 or minimum DR13.5 for PE2406 or PE3406. Joints and fittings shall be fusion bonded in accordance with ASTM F-1290. Mechanical joints will

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be considered but subject to pre-approval by LCPW. Any such restraint or fitting shall be approved for use by the pipe manufacturer.

4. No shear mission couplings shall be used to join dissimilar pipe materials.
5. Unconnected service stubs shall be terminated within one foot (1') of the property line and marked with a 2x4, painted green and extending two to four feet above grade.

F. Air and Vacuum Release Valves

1. Air release or combination air/vacuum wastewater valves shall be A.R.I. Model D-025 Combination Air Valve for Sewer with stainless steel/reinforced nylon body. All tapping saddles for force main connections shall be full body stainless steel. Smith-Blair #372 shall be used for new taps. Double bolted Smith-Blair #264 shall be used for all repairs.
2. Tracer wire shall enter the air relief/vacuum valve vault in an approved manner such that the structure is free of infiltration.
3. If the distance between air relief/vacuum valve vaults exceeds 1,000', tracer wire stations will be required. Tracer wire stations in green areas will be Rhino TriView Flex Tracing Wire Stations. In paved areas, they will be Valvco Tracer Wire Access Box for H2O.

4.03 Water Distribution

A. General

1. Engineering drawings submitted for review shall include lineal footage between center of valve vaults or connections to existing water main, diameter of pipe, material type, and elevations for all piping and appurtenances.
2. All metal fittings and fasteners shall be stainless steel. Fasteners shall be type 304, austenitic, stainless steel installed with anti-seize coating (TS Moly-Lubricants, Houston, TX, TS-74).
3. For open cut construction, a continuous, insulated, 12 gauge copper wire suitable for direct burial shall be taped on top of all piping to provide for locating following construction. This wire shall be securely terminated inside every valve vault on stainless steel hardware with an exposed lead of at least 12". A mechanically secure and soldered connection shall be provided for all wire splices. Where construction is by directional drilling or similar trenchless technology the tracer wire shall be 3/16" 7x19 PVC coated stainless steel aircraft cable with minimum breaking strength of 3,700 lbs (Lexco, Chicago, IL). Or **Trace-Safe** water blocking tracer wire RT series 19 gauge conductor (RT 1802W water, Rt 1803W sewer).

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4. Before final approval of any water main, there will be a LCPW monitored tracer wire continuity test in order to confirm proper installation of any tracer wire.
5. If the distance between valve vaults exceeds 1,000' tracer wire stations will be required for current induction. Tracer wire stations in green areas will be Rhino TriView Flex Tracing Wire Stations. In paved areas, they will be Valvco Tracer Wire Access Box for H2O loading.

B. Pipe for Water Mains and Service Connections

1. Completed design and materials in accordance with SSWSMCI, Division IV, Section 40 with the following exceptions:
  - a. All fasteners, bands, other non cast or ductile iron fittings, and accessories shall be approved plastic or non-ferrous metal.
  - b. Asphaltic or epoxy coatings must be provided on all cast or ductile iron fittings.
2. Pipe Materials approved for installation shall be limited to the following:
  - a. Type K copper pipe in accordance with ASTM B88 and B251 for water services (only) up to 2" in diameter. The minimum service diameter shall be 1". Service lines, valves and fittings shall be suitable for use with pressures to 150 psi.
  - b. Ductile iron pipe conforming to ANSI A 21.50 (AWWA C150) designed per ANSI A 21.50 (AWWA C150) with minimum wall thickness corresponding to Class 52. Pipe must be cement lined per ANSI A 21.4 (AWWA C104) and encased for corrosion protection with wrapper meeting ANSI/AWWA Standard C105/A21.5. Wrap shall be extended for a minimum of 3' up from all copper water service connections.

Fittings shall conform to ANSI A21.10. Connections may be made with flanged or push on mechanical joints. Elastomeric seals for push-on joints shall comply with ASTM F477 and shall be pressure rated in accordance with ASTM D3139.

Where ductile iron pipe is used with copper services, an electrical insulating coupling shall be provided at the service tap for corrosion protection from stray electrical currents.

- c. Polyvinyl Chloride (PVC or PVCO) pressure rated pipe (SDR) and fittings meeting ASTM D4336, ASTM D2241 and AWWA C900, C905 or C909 for water main or service applications 4" diameter and above. PVC C900 and C905 pipe shall have a minimum wall thickness corresponding to an SDR of 18. PVCO C909 pipe shall have a minimum wall thickness corresponding to an SDR of 33. PVC

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pipng shall be provided in cast (ductile) iron pipe outside diameter sizes.

Connections may be made with flanged or push-on joints with elastomeric seals meeting ASTM 3139 and ASTM F477. No solvent cement joints will be allowed. Flanged joints are required for all connections to pumps, valves and other serviceable pipeline appurtenances.

- d. High Density Polyethylene (HDPE) meeting the applicable requirements of ASTM D2239, D3035 and AWWA C901 (1" ID through 3" ID) or C906 (nominal 4" and above). Pipe shall have a minimum pressure rating of 150 psi and minimum wall thickness corresponding to DR 11 for PE3408 or minimum DR 9.3 for PE2406 or PE3406. Joints and fittings shall be fusion bonded in accordance with ASTM F1290. Mechanical joints shall use full circumference clamping and will only be considered subject to pre-approval by LCPW. All fittings shall be specifically designed and pre-approved for use with HDPE pipe and installed in strict conformance with the manufacturer's instructions. Megalugs and similar fittings using set screws or drive lugs into the wall of the pipe will not be allowed. HDPE pipe shall be provided in ductile (cast) iron pipe outside diameter sizes (DIOD).

3. Prior to disinfection of commercial building services, where applicable the tee shall be installed on the riser in the building and the first two permanent valves shall be installed, one on the fire line and one on the domestic line. Sampling taps shall be provided where requested by LCPW representatives.

C. Pipe Installation for Water Mains

Completed design and materials in accordance with SSWSMCI, Division IV, Section 41 with the following exceptions:

1. PVC pipes shall be laid straight without residual stresses. Joint deflection must not exceed manufacturer's recommendations. High deflection joint couplings such as CertainTeed HD may be used in lieu of elbows when done in accordance with manufacturer's recommendations.
2. Initial filling and flushing of water mains shall be done by LCPW personnel only.
3. New water mains shall be tested in the presence of, and approved by, LCPW personnel.
4. Chlorination of water mains shall be done by certified chlorination firms approved by LCPW.
5. Bacteriological testing following disinfection shall be done either by the LCPW or other IEPA certified laboratory with original sample sheets supplied. In the event one or more of the sampling tests are unsatisfactory LCPW retains the right to take over the sampling process.

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D. Main Line and Service Connections

1. All taps larger than 2" shall be made with full body stainless steel pressure tapping sleeve and gate valve. Such taps shall be enclosed in vaults, minimum 5' diameter.
2. For non ductile iron pipe, all taps 2" and smaller for mainline connections shall use stainless steel, full body tapping saddles. Smith-Blair #372 shall be used for new taps. Double bolted Smith-Blair #264 shall be used for all repairs. For HDPE all service connections shall be thermally or electrically fused in a pre-approved manner by properly trained personnel.

E. Gate Valves for Water Mains

Completed design and materials in accordance with SSWSMCI, Division IV, Section 42 with the following exceptions:

1. Resilient wedge epoxy coated gate valves shall be used for all water mains less than 16" in diameter.
2. All buried hardware shall be non-ferrous material.
3. Gate valves shall be Mueller A2360 or Waterous 2500 meeting AWWA C509 or C515.

F. Butterfly Valves for Water Mains

Completed design and materials in accordance with SSWSMCI, Division IV, Section 43 with the following exceptions:

1. Butterfly valves shall not be used for water mains smaller than 16" in diameter.
2. Valves shall be epoxy coated.
3. All buried hardware shall be non-ferrous material.

G. Curb Valves/Curb Stops

1. Curb valves shall be rated for 175 PSIG working pressure, meeting ANSI/AWWA C800.
2. Valve shall used one piece closed bottom, all brass construction, no drain, large diameter top with T head, port sealing O-rings, Minneapolis thread top with copper flare nut on both ends, Mueller H-15154.

H. Valve Vaults and Boxes for Water Mains and Water Services

Completed design and materials in accordance with SSWSMCI, Division IV, Section 44 with the following exceptions:

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1. 5' inside diameter valve vaults shall be provided for all water main valves 8" and larger.
2. Construction must use precast or formed in place reinforced concrete. Concrete masonry units, concrete brick and clay brick will not be allowed.
3. Where flat top manholes are used the covers must have precast corbels for attachment of external chimney seals.
4. Unless otherwise required by the Illinois Department of Transportation Standards in IDOT right of way, valve vault frames must be Neenah R-1772 or EJIW 1022Z1 with frame inside diameter of 23", height of 7", flange diameter 34". Lids shall be Neenah R-1772 or EJIW 1020A with 22-3/4" outside diameter, 1-3/4" high with a minimum load capacity of 48,000 lbs. Lid shall be stamped "Water" and be provided with T-seal and concealed pickhole.
5. Valve vault stairs where required by LCPW shall be steel reinforced polypropylene, 14" minimum width, M.A. Industries model PS2-PF. Steps shall be placed on nominal 14" centers.
6. Valve vaults shall be provided with adjusting rings no less than two inch (2") high and no more than a total of ten inches (10") high.
7. For water distribution system valves six inches (6") and smaller, valve boxes may be supplied as an alternate to valve vaults. Valve boxes shall be Tyler 3 piece and shall have a full cast or ductile iron body with rubber valve box stabilizers. Valve box covers shall be labeled "Water".
8. For water service connections two inch (2") diameter and smaller curb boxes shall be supplied. Curb boxes shall be "Minneapolis" pattern, slide adjustable, Mueller H-10300.
9. Curb boxes should be placed on public property normally one (1) foot from the property line, but must not be placed in or under sidewalks. Where sidewalks lie immediately adjacent to property lines the curb box should be placed approximately two feet from the street-side edge of the sidewalk with the copper service line extending from the curb box underneath and five (5) feet beyond the edge of the sidewalk.
10. Unconnected service stubs shall be provided with curb stops and a pigtail approximately 1 foot long, crimped at the end and marked with a 2x4, painted blue and extending two (2) to four (4) feet above grade.
11. Electrical grounding for all services shall follow the National Electrical Code.

I. Fire Hydrants

Completed design and materials in accordance with SSWSMCI, Division IV,



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Section 45 with the following exceptions:

1. Fire hydrants shall be Mueller Super Centurion A423-250, East Jordan Water Master 5CD250 or Waterous WB67-250 with bronze seats. Hydrant shall have a 250 psig working rated pressure and shall utilize an oil reservoir lubricating system. Hydrants shall be traffic model with upper and lower barrels joined by a breakable flange and a stainless steel break coupling.
2. Hydrants shall have the OSHA yellow factory applied coating. Damage to factory coating shall be power tool cleaned per SSPC-SP3 followed by a direct to metal acrylic enamel, Pitt-Tech 90-330. Final coating colors shall meet all local code requirements.
3. The auxiliary hydrant valve shall be direct coupled to the hydrant without spool piece. Valve shall meet the requirements of water main valves.
4. Where fire hydrants are located further than 150 feet from the closest residence, a minimum 53" high, 5/16" diameter galvanized spring, spring steel riser and 20 square inch red lexan flag (USABlueBook 44064) shall be attached to the hydrant.

J. Pressure Connections

Completed design and materials in accordance with SSWSMCI, Division IV, Section 46 with the following exceptions:

1. All tapping saddles for non HDPE mainline connections shall be full body stainless steel. Smith-Blair #372 shall be used for new taps. Double bolted Smith-Blair #264 shall be used for all repairs. HDPE mainline connections shall be made with Friatec type "VA" electrofusion service saddles.
2. All taps, other than services 2" and smaller, shall be made with pressure tapping sleeve and valve. Such taps shall be enclosed in vaults, minimum 5' diameter.
3. Valve vaults with eccentric cones shall be provided for pressure connections.

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K. Backflow Prevention Devices

1. Backflow prevention shall be installed in accordance with the Illinois Plumbing Code, IEPA Title 35, Subtitle F chapter II Part 653.801 and the LCPW Cross-Connection Control Ordinance. See Appendix for excerpt of the Cross Connection Control Ordinance specifying when and what type of backflow prevention is required.
2. The installation of the backflow prevention device shall be certified by a certified Cross-Connection Control Device Inspector. Copies of the certification shall be submitted to LCPW. Subsequent testing of the device shall be done in accordance with the Control Ordinance.

# **LCPW Sewage Pumping Stations**

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*Sewage pumping station design shall be in accordance with the latest addition of the IRSSW Part 370 Subpart D unless specifically addressed in SSWSCI or otherwise noted below. IRSSW sections are noted below for reference purposes.*

## **Section 370.400 General**

### **Site Requirements**

*The lift station site and access to it shall be approved by Lake County Public Works. The dimensions of the site shall be sufficient for vehicular access to all structures for maintenance purposes, and provide parking for a minimum of two vehicles without driveway obstruction.*

### **Site Ownership, Access and Permitting**

*As a minimum acceptable property interest in the lift station site, LCPW shall be provided a perpetual utility easement for the lift station property and site access. Access to the site shall be provided from an existing public roadway suitable for limited heavy truck travel independent of weather conditions.*

*This easement shall include full rights of ingress or egress by LCPW or its employees, contractors or agents without pre-authorization for the purpose of installation, operation or maintenance of the lift station facility and its appurtenances. The easement shall further prohibit any action by the grantor, its successors or assigns, employees, contractors or agents that may impair the exercise of those rights.*

If property interest for the lift station is to be conveyed to LCPW as part of a lift station construction project, a map or plat of survey of the site shall be provided incorporating a legal description of the property, the boundaries of the property, the total area of the property, topographic contours at 2-foot intervals of the property following construction, the location, width and name of all existing or previously platted street, railroad, and utility easements and rights-of-way and the location of exist sewers, drainage tiles, water mains, culverts and other underground facilities within or proposed to be installed in the tract, indicating pipe sizes, grades, manholes and location.

*Lift stations sited in unincorporated areas of Lake County are subject to permit regulations including but not limited to the Lake County Unified Development Ordinance ("UDO"). Requirements and restrictions include but are not necessarily limited to*

*Site Capacity Calculation and Site Plan Review Procedure (Article 4, parcels larger than 40,000 square feet)*

*Natural Resource Protection Standards for Regulatory Floodplains, Wetland, Nonlinear and Linear Water Bodies, Buffers, Woodlands and Significant Trees (Sections 4.2) Floodplain, floodway, wetland and soil erosion and sediment control provisions (Section 8.1, including compensatory storage Section 8.5.8)*

*Site Development permits (Section 8.1.2H).*

*Site Development Plan and Site Development Report (Section 8.1.6)*

*Landscaping (Section 9.3)*

*Architectural Standards (Section 9.7)*

*Subdivision Application Requirements (Section 10.2.3.O.3.f.3)*

*Sanitary Sewage Disposal Facilities (Section 10.9)*

### **Utilities**

*The coordination necessary for obtaining utilities shall be the responsibility of the Contractor. LCPW will cooperate with the Contractor by executing all forms necessary for establishing necessary service accounts, required for new permanent facilities. Unless specifically provided otherwise, all costs associated for utility construction and startup shall be borne by the Contractor.*

### **General Construction Considerations**

*All fasteners used in buried or wetted or surfaces potentially exposed to corrosive gasses shall be non-ferrous material, 304 stainless steel, or approved equal.*

*Unless otherwise specifically noted, all equipment and appurtenances installed in the wet well shall be non-ferrous.*

### **Pavement and Sidewalks**

*Driving and parking areas shall be paved. Pavement design shall require*

*Removal of all soils containing more than 1% organic matter and subsequent backfill using compacted crushed concrete aggregate, limestone aggregate or other approved structural fill.*

*A geotextile meeting AASHTO materials specification M-288, with maximum apparent opening size (AOS) of 100 (150 micron) placed in strict accordance with geotextile manufacturer's recommendations prior to placement of any granular materials. A minimum 8" base of crushed concrete aggregate, limestone aggregate or approved equal shall be provided under paved walkways and driveways, or unpaved maintenance access to structures.*

*A minimum 3.5" of Mix C, Class I, Type 2 bituminous concrete.*

*Sidewalks shall be constructed using 5-inch thick concrete on top of 4-inch thick aggregate base course meeting the requirements of UDO Section 10.15.19.*

### **Structures**

*Above ground structure architectural design must be consistent with and complementary to neighboring structures and landscaping.*

*The design of all below grade structures, with the exception of precast manholes and valve vaults shall be reviewed and approved by a licensed structural engineer.*

*Below grade steel structures shall be provided with an active cathodic protection system designed by a NACE certified cathodic protection specialist CP Level 3.*

*Concrete wet wells shall be lined with a minimum 1/2" of factory blended 100% calcium aluminate cement based mortar or high strength microsilica mortar with anti-microbial admixtures: Strong Seal Systems High Performance Mix , Kerneos Sewper Coat PG, LaFarge Corporation Quadex Aluminaliner, or Permacast MS-10,000 with Con(mic)Shield or equal.*

### **Painting**

*Steel structures and surfaces are to receive two prime coats of polyamide epoxy coating, minimum total 10 dry mil thickness using contrasting colors for each coat. The final coat shall be minimum 3 dry mil thickness polyurethane. Colors to be selected by LCPW.*

*Submerged, wetted or below grade carbon steel surfaces and structures shall receive SSPC SP-10 surface preparation. Other steel surfaces shall meet SSPC SP-6 requirements.*

### **Landscaping and Signage**

*Landscaping shall be consistent with and complementary to neighboring properties and meet requirements of the UDO Section 9.3.*

*One (1) two-square foot sign constructed from durable, non corroding material shall be provided on the lift station providing emergency contact information as required by Lake County Public Works.*

## **370.410 DESIGN**

### **a) Type**

*Sewage pumping stations requiring pumps 75 HP or less shall use the submersible design. Station designs requiring pumps greater than 75 HP shall be considered on a case by case basis.*

### **Access Hatches**

*Access to wet wells and valve vaults larger than 4-foot diameter shall be by aluminum access hatches. Hatches shall be provided with a recessed or flush opening mechanism and stainless steel locking hasp.*

*Design of the access hatch shall be such that it is sized for removal of the largest installed component in the structure without disassembly. Hatches installed on a structure at least 8 inches higher than the adjacent grade must be capable of supporting a minimum concentrated load of 500 lbs. Otherwise, hatches must be designed to support an H-20 wheel load.*

### **Electrical and Instrumentation Enclosures**

*All outdoor electrical and instrumentation boxes and enclosures shall be stainless steel, dead front enclosure NEMA 4 with drip shield. External doors shall be hinged and provided with locking hasps. Enclosures shall include a 10 gauge steel interior equipment mounting panel, NEMA swing-out panel and necessary ventilation to prevent overheating in summer.*

*No conduits shall be filled to greater than 50% capacity. Every conduit run longer than ten feet shall have a nylon pull line installed with the conductors.*

*Electrical and instrumentation enclosure pad(s) shall be set at an elevation 8" above the adjacent finished grade.*

### **Power and Instrumentation Wiring**

*To the greatest extent practicable wiring for power and instrumentation shall be installed without splicing between the device and control panel. In the event an intermediate splice for instrumentation or control wiring is unavoidable it shall be done in an above ground cabinet or pedestal. Terminal strips shall be required for all signal and power wiring 120 volts or below. No terminal strips or splicing shall be at a level less than 18" above grade.*

### **Wire Labels**

*All wires shall be labeled at their terminations and all intermediate pull boxes. Wire labels shall be made using a label printer such as the Brady ID Pal labeling tool, Brady Worldwide, Inc., Milwaukee, WI or approved equal. Label printing shall be non smearing black text on white background using a minimum 10 point font. The label shall be weatherproof and abrasion resistant, suitable for exposure to oil, grease and mild water or petroleum based solvents without loss of adhesion or legibility.*

*For electrical enclosures containing power transformers, outdoor enclosures without sun shielding, or other enclosures where internal temperatures in excess of 105 deg F are anticipated, labels shall be equal to Brady B-499 polyamide coated nylon cloth labels with acrylic pressure sensitive adhesive. For all other applications, labels shall be Brady B-439 vinyl film with acrylic pressure sensitive adhesive.*

### **Instrumentation & Controls. (Modified 4/19/04 apm)**

*All components in the lift station control panel shall be UL approved.*

*The sewage pumping station shall be provided with an Allen Bradley Micrologix 1500 PLC with memory and real time clock module including 5 meter RS232 Operating/Programming cable.*

*A Panelview Plus 600 Color Touchscreen 2711P-T6C20D terminal. The Panelview shall be provided with a blank external 32MB compact flash card and external compact flash card to PCMCIA adapter.*

*The Micrologix and Panelview Software and programming will be provided by Lake County Public Works.*



*Sensors and appropriate Micrologix interface modules shall be provided to monitor the following parameters*

*Pump called for  
Pump run (each pump)  
Wetwell level  
Pumping rate (when required)  
Pump run time (each pump)  
When provided  
Generator called for  
Generator run.  
Generator run time  
Alarms as listed in Section 370-440 below  
Phase monitoring*

*LCPW may require, at its option, the use of a Consolidated D152 controller for pump control.*

*Pump run timers shall be by Cramer.*

*Phase monitors shall be octal 8 pin plug in type manufactured by Diversified Electronics or Time Mark.*

*Pump seal failure shall be monitored by Time Mark Dual Seal Failure protector.*

*Motor starters, breakers and contactors shall be manufactured by Allen Bradley.  
All relays shall be manufactured by Potter Brownfield or Square D tubular terminal Type KP*

***Power supply and power protection and conditioning shall be SOLA Hevi-duty DIN Rail Series.***

*Terminal strips shall have a minimum of 50% unused terminal capacity.*

*A battery backup shall be provided to power instrumentation and telemetry for a minimum 8-hour period following power failure. The battery shall be lithium ion, nickel metal hydride or other technology that does not require periodic conditioning to maintain full capacity.*

*Pressure measurement – 1/4" npt brass instrumentation cocks shall be provided in the valve vault on the discharge line of each pump prior to the check valve and also on the pump header discharge.*

Level measurement – Level measurement shall be provided using Dwyer PBLTX-10-##-PU<sup>2</sup> level transducers with voltage surge suppression mounted in the wet well. Transducers signal shall be 4-20 ma output with >10,000 amp peak surge (lightning) protection. Each transducer lead shall be isolated with an intrinsically safe Zener barrier.

A four float mercury float ball level backup system shall be provided with a Diversified Electronics ARM series integrated duplex controller. Inputs must be intrinsically safe.

#### **Valves –**

Check valves shall be flanged, full-bodied swing type for sewage applications with position indicator, counterweight arm, bronze seat, and mechanism for backwashing. Pratt Swing Check valve or approved equal. All check valve internal parts must be cast/ductile iron, non ferrous or fully encapsulated steel.

Valves larger than 4" shall be flanged resilient wedge epoxy coated gate valves, Mueller A2360 or Waterous 2500 gate valves meeting AWWA C509 or C515. , **Valves shall be provided with a standard operating nut and be furnished with an operating lever unless otherwise shown on the plan. Valves larger than 8" shall have operators preapproved by LCPW.**

For valves 4" diameter and smaller non-lubricated, eccentric, resilient face plug valves with a minimum 80% full port area (for valves 20" diameter and smaller). The valve body shall be ASTM A126 class B with corrosion-resistant seats in compliance with AWWA C507 and C504. Valves shall have a position indicator.

All buried hardware shall be non-ferrous material.

#### **Flow measurement**

Flow measurement, when required by IRSSW shall be provided using magnetic or transit time type ultrasonic flow meters. Instruments must provide a local readout of flow rate and flow total, and further to provide an isolated 4-20 ma signal proportional to the flow rate.

When flow measurement is not required by IRSSW, there shall be provided in the valve vault or other downstream structure on site a discharge pipe mounting location for a portable flowmeter. The pipe should provide a straight, accessible uninterrupted upstream length of 10 pipe diameters followed by a minimum straight run of 5 pipe diameters. This pipe shall be oriented so as to flow full during pumping.

## **Section 370.430 Submersible Pump Stations – Special Considerations**

### **Valve Vaults**

*Completed design and materials must be in accordance with SSWSMCI, Division III, Section 33 with the following exceptions:*

*Valve vault construction may use steel or concrete. Concrete valve vaults may be constructed of precast or formed in place reinforced concrete. Concrete masonry units, concrete brick and clay brick will not be allowed.*

*Valve vaults must be designed to provide a minimum 6" clearance between the edge of flanges or other service and the sidewall of the vault. A minimum 18-inch diameter, 12 inch deep sump shall be supplied for vault dewatering.*

*All pipe penetrations through structures shall be made using Link-Seal. Steel structures must provide a welded pipe sleeve to accommodate the Link-Seal.*

## **Section 370.440 Alarm Systems**

### **Alarms –**

*The following alarms shall be provided:*

*Pump shaft seal failure  
Power failure  
Pump failure  
Unauthorized entry  
Telemetry failure  
High water level  
Generator fail  
Common*

*All alarms shall be annunciated through the Micrologix controller. The common alarm should be announced using a red light mounted at the top of the I&C enclosure.*

### **Telemetry**

*An automatic telephone dialer, Sensaphone Model 400<sup>1</sup>, shall be provided to annunciate all alarms.*

## Section 370.450 Emergency Operation

### **Standby power (Revised 4/19/04, 9/23/05 apm)**

Standby electrical power shall be provided by a second geographically separated and electrically independent substation utilizing an automatic transfer switch **manufactured by Asco, Zenith or Generac**. The two power supplies shall not share any conduit or duct up to the emergency transfer switch.

Where a second independent electrical source is not available, standby power shall be provided for each lift station by an emergency natural or LP gas or diesel generator, sized for full station connected load. The emergency generator shall be provided with an automatic transfer switch and controls to facilitate automatic unattended exercise of the generator on a weekly basis. The generator manufacturer shall be as approved by LCPW.

Where fuel storage for operation is required, fuel storage capacity must be sufficient to operate the station at maximum design load for a minimum of 24 hours.

For stations with less than 20 total connected horsepower, and a minimum 12 hours of storage capacity at maximum daily flow rates, consideration will be given to allowing portable generating equipment with appropriate emergency electrical connections and fuel storage capacity.

A load step analysis must be provided based upon starting conditions representing the most conservative load sequencing of pumping and auxiliary electrical equipment.

The engine generator set shall be provided with a sound attenuation enclosure and meet all applicable noise standards.

The engine generator shall be mounted on a reinforced concrete pad designed in accordance with the manufacturer's recommendation.

The generator shall be provided with a 5 year warrantee.

End of Section

Revision notes

9/23/05 apm. Consolidated changes and placed in U:/Engr/Library. Added check valve spec. Extended control spec.

9/30/05 apm Struck out Consolidated D152 controller

*Lake County Public Works  
Lift Station Design Standards  
6/9/14*

*11/3/06 apm Added Power & Instrumentation Wiring*

*7/24/08 apm added resilient wedge gate valves as alternate to plug valves in force mains per MG.*

*9/11/08—1—The 1104 was replaced by the 400. RWR*

*9/11/08—2—The KPSI Series 750 was replaced by the Dwyer PBLTX-10-##-PU. RWR*

*2/16/09 added Strong Seal Systems High Performance Mix to acceptable sulfate resistant liners per GPW(RWR)*

*11/23/10 apm Added genset noise and foundation requirements.*

*1/14/11 apm Revised all valves above 4" to be resilient gate valve.*

*4/2/14 rwr Added 5 year warrantee requirement to stand by generators*

**SPECIFICATION HC05121  
STRUCTURAL STEEL FABRICATION  
FOR RAILWAY BRIDGES  
(MODIFIED)**

SZ

**OFFICE OF THE CHIEF ENGINEER - STRUCTURES**  
CANADIAN NATIONAL RAILWAY  
EDMONTON, ALBERTA  
January 12, 2010

**GENERAL CONDITIONS**

~~The general conditions of the purchase order and all parts of Section HC01000 shall apply equally to this Specification.~~

**PART 1 - GENERAL**

**1.1 Work Included**

- .1 The work shall include all members required to complete the steel superstructure as shown on the drawings and as specified herein.
- .2 This work shall generally include supply, fabrication, assembly, loading and blocking of the following:
  - .1 plate girders, including shear connectors
  - .2 stiffeners,
  - .3 diaphragms,
  - .4 jacking beams,
  - .5 floor beams, spacer beams and stringers,
  - .6 bottom and top cross bracing,
  - .7 gusset plates,
  - .8 lifting devices,
  - .9 inspection catwalks and inspection bars,
  - .10 all shop and field high strength connection bolts,
  - .11 shop welds
  - .12 trainman's walkway grating, handrail, support structures and field connection hardware
  - .13 deck plates and deck drains
  - .14 grillages and shim plates
  - .15 deck joint cover plates
  - .16 fibre optic support brackets
  - .17 all other members required to complete the steel superstructure as shown on the drawings and specified herein.
  - .18 all labour, material and equipment required to load and block the steel superstructure on Railway cars for transport.
- ~~.3 Work included in a specific project will be listed in Section HC01000 of the Specifications.~~

**1.2 Work Excluded**

- .1 Substructure construction, off-loading of the bridge spans, removal of existing spans and erection of new spans and other associated materials at the bridge site.
- .2 Track materials (ties, tie plates, rails, guardrails, crushed rock ballast, spacer bars, hook bolts and hardware) will be supplied by others.

### 1.3 Related Work Specified Elsewhere

- .1 Fixed and expansion bridge bearings.

### 1.4 Reference Specifications, Standards and Guidelines

- .1 Perform work in accordance with the requirements of this Specification and the latest versions of following documents:
- .1 AREMA Chapter 15 (2009) - Steel Structures
  - .2 CSA G40.20/G40.21-04 (R2009) - Structural Quality Steel
  - ASTM A709/A709M-09a - Standard Specification for Structural Steel for Bridges
  - A588/A588M-05 - Standard Specification for High-Strength, Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance
  - A572/A572M-07 - Standard Specification for High-Strength, Low-Alloy Columbium-Vanadium Structural Steel
  - A500/A500M-09 - Standard Specification for Cold-Formed Welded and Sea
  - A36/A36M-08 - Standard Specification for Carbon Structural Steel
  - .3 ASTM A325-09a, Type 3 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
  - .4 ASTM F1554-07a - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
  - .5 CSA W59-03 (R2008) - Welded Steel Construction (Metal Arc Welding)
  - AWS D1.5/D1.5M:2008 - Bridge Welding Code



- |     |      |                        |  |
|-----|------|------------------------|--|
|     | AWS  | A5.29/A5.29M:2010      | - Specification for Low-Alloy Steel Electrodes for Flux Cored Arc Welding  |
| .6  | CSA  | W47.1-09               | - Certification of Companies for Fusion Welding of Steel   |
| .7  | ASTM | B833-09                | - Standard Specification for Zinc and Zinc Alloy Wire for Thermal Spraying (Metallizing) for the Corrosion Protection of Steel                                       |
|     | AWS  | C2.23-03/SSPC-CS 23.00 | - Specification for the Application of Thermal Spray Coatings (Metallizing) of Aluminum, Zinc, and Their Alloys and Composites for the Corrosion Protection of Steel |
|     | AWS  | C2.18-93               | - Guide for the Protection of Steel with Thermal Sprayed Coatings of Aluminum and Zinc and Their Alloys and Composites   |
| .8  | ASTM | A123-09                | - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products   |
| .9  | ASTM | A153-09                | - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware   |
| .10 | ASTM | B695-04 (2009)         | - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel   |
| .11 | CNR  | Standard Details       | - S1, S2, S3, S4, S5, S6, S7, S8, S10  |
| .12 | CNR  | TD-05-L1               | - Location for Bridge Name   |
- .2 The Fabricator shall insure that the steel fabricator's foreman and welding supervisor have a copy of the specifications and AREMA Chapter 15; and are readily available for CN Inspectors' reference.

### 1.5 Source Quality Control

- .1 Prior to fabrication provide the Engineer with two copies of steel producer certificates, in accordance with CSA G40.20 (ASTM A6) for all steel supplied by Contractor.
- .2 Provide the Engineer with two copies of Charpy V-notch certified test reports prior to the start of fabrication.
- .3 Materials and fabrication will be subjected to inspection by Engineer or by organization appointed by Engineer. Provide suitable facilities and cooperate fully with inspection organization and Engineer in carrying out inspection and tests required.
- .4 Fabricator shall submit to CN's appointed Inspection Engineer for review and approval of material traceability reports and non-destructive test results carried out as part of internal quality assurance in the plant.

### 1.6 Identification of Correspondence and Shop Drawings

- .1 Clearly identify all shop drawings and correspondence submitted to the Engineer with the project title as it appears on the Railway's drawing title block including subdivision and mileage.

### 1.7 Shop Drawings

- .1 Submit shop drawings for review by the Engineer before any shop work is commenced. Shop Drawings are to be submitted in electronic "PDF" format. These can be sent via email or deposited on to CN's FTP site.
- .2 Clearly indicate shop and erection details including cuts, copes, connections, holes, bearing plates, threaded fasteners, and welds. Indicate welds by CSA / AWS welding symbols.
- .3 All changes in material from that specified shall be underlined in red on all prints submitted for review.
- .4 After review, provide corrected drawings in electronic "PDF" format. These can be sent via email or deposited on to CN's FTP site.
- .5 No alterations shall be made to any reviewed plan without the written consent of the Engineer.
- .6 Correctness of all shop drawings irrespective of any review by the Engineer shall be the responsibility of the Fabricator.
- .7 As-built shop drawings shall be submitted in electronic form. Electronic form shall be submitted on a CD disk in two different formats - ADOBE ACROBAT "PDF" and AUTOCAD "DWG".

- .8 As-built shop drawings in electronic form shall be delivered to the Railway Company as soon as the shop fabrication is completed, drawings shall be addressed to:

**CANADIAN NATIONAL RAILWAYS**

George Nowak, P. Eng  
Senior Structural Engineer  
10229 – 127<sup>th</sup> Avenue,  
Floor 2 Building "B",  
Engineering - Structures,  
Edmonton, Alberta  
T5E 0B9

- .9 Drawings shall be drawn to the same system (Metric or Imperial) as the Railway Company's drawings.
- .10 Any materials ordered with the exception of material supplied by CN prior to the review of the shop detail drawing shall be at the Fabricator's risk.
- .11 Final payment will not be issued unless all plans are delivered to the Railway Company.
- .12 Each job shall be considered separately. Complete sets of shop drawings for each bridge location, clearly identified as to Subdivision, Mileage and name of crossing are to be submitted for the Engineer's review. Detail plans for each bridge location shall be complete with all sizes of materials indicated for each set.

~~1.8~~ **Method of Payment**

- ~~.1~~ Submit Lump Sum Prices on the "**Request for Quotations**" for fabrication, loading and blocking for each span.
- ~~.2~~ The Lump Sum for fabrication shall include loading and blocking to CN approval on railcars.

**PART 2 - PRODUCTS**

**2.1 Materials**

- .1 **General requirements for steel:**
- .1 Steel shall be in accordance with CSA G40.21 or ASTM A709, A588, A572, A500 and A36.
- .2 Grade and types, Fracture Critical Members:

- .1 CSA G40.21 Grade 350AT Category 5, A709 Grade 50WF3
  - .1 Plate girder webs and flanges,
  - .2 Stringers, floor beams and jacking beams (made from steel plate)
- .2 CSA G40.21 Grade 350AT Category 3, A709 Grade 50WF3
  - .1 Stringers, floor beams and jacking beams (from rolled sections)
  - .2 Connections between floor beams and main girders.
  - .3 End bearing stiffener plates
- .3 Grade and Types, Non-Fracture Critical Members:
  - .1 CSA G40.21 Grade 350A, 350W, (A588, A709, A572 and A36 with minimum actual yield strength of 50 ksi)
    - .1 Bracing
    - .2 Struts
    - .3 Intermediate and horizontal stiffeners
    - .4 Knee bracing
    - .5 Deck plates
    - .6 Walkway brackets
    - .7 Columns/posts
    - .8 Jacking beams when used solely for jacking and not part of a floor system
    - .9 Gusset plates
    - .10 All other miscellaneous components
  - .2 CSA G40.21 Grade 300W (A572, A36, A500 Grade B with minimum actual yield strength of 42 ksi)
    - .1 Secondary members to be galvanized as specified on the drawings
- .4 When ordering steel from the Mill, state that it will be used for railway bridge construction.
- .5 Furnish to the Railway Company's Shop Inspector mill test reports, properly correlated to all steel sections to be used for steel construction under this specification.
- .6 Before the start of fabrication, supply to the Railway Company the results of the low temperature Charpy impact tests made in accordance with CSA G40.21 (ASTM A709). Three test pieces for thickest plate of each heat of web and flange plates in the main girders shall be taken. The tests shall be taken at the temperature of -30 deg. C (-22 deg F) and shall have the following guaranteed minimum average level of energy absorption:
  - .1 Category 5 material - **34 Joules (25 ft-lbs)**
  - .2 Category 3 material - **27 Joules (20 ft-lbs)**

- .3 For ASTM designated steels, impact test requirements will be as per Zone 3 service temperatures of Table 15-1-14 of AREMA Chapter 15 for Fracture Critical Members, and will be as per Zone 3 service temperatures of Table 15-1-2 for NonFracture Critical elements.
- .7 Material for Charpy specimens shall be supplied to the Railway Company for their inspection when requested.
- .8 All identification and erection marks shall be located on surfaces, which will not be visible in the completed structure.
- .9 Fabrication shall be carried out in the Fabricator's own plant, the use of sub-contractors for all or portions of the fabrication will only be considered unless applied for in writing by the Fabricator and subsequently approved in writing by the Engineer. The Fabricator shall be fully responsible for the quality of work and shall bear all additional costs related to work being carried out at the sub-contractors plant such as additional quality inspections, shipment, etc.
- .2 **High strength bolts, nuts and washers:** bolts to ASTM A325 Type 3, nuts to ASTM A563-C3 Grade DH3 and washers to ASTM F436 Type 3. Galvanized bolted items may be used when approved by the Engineer. Bolt tightening shall be provided by means of the turn-of-nut method.
- .3 **Anchor bolts, washers and nuts:** anchor bolts to ASTM F1554, Grade 105 and supplied with UNC threads as shown on Drawing S3m/S3i. Steel plate washers shall be of sufficient area to completely cover each hole, with a minimum yield strength of 250 MPa (36 ksi). Nuts shall be specified as ASTM A563, heavy-hex style, to accommodate overlapping of threads due to metallized coatings. Anchor bolts, washers and nuts shall be galvanized.
- .4 **Welding:**
- .1 Welding of principal members shall be performed by automatic or semi-automatic submerged arc process, in accordance with CSA Standard W59 Welded Steel Construction or AWS D1.5.
- Gas metal-arc, electrogas, and electroslag welding are not permitted.
- Welds between the web and flange plates shall be made in the flat position, except that 8 mm (5/16") fillet welds may be made in horizontal position.
- The fabrication of steel members designated herein or on design plans as fracture critical members and the materials making up those members shall be in accordance with the requirements set forth in AREMA Manual for Railway Engineering, Chapter 15,

Section 1.14 - Fracture Critical Members. All welding for fracture critical members shall be in accordance to AWS D1.5, Section 12.

- .2 Welding electrodes and fluxes shall conform to the latest revised editions of:
- .1 CSA W48 / AWS D1.5 for submerged arc welding
  - .2 CSA W48 / AWS D1.5 for manual welding
  - .3 AWS A5.29 / A5.29M for flux cored arc welding

The deposited weld metal shall have atmospheric corrosion properties and Charpy V-Notch impact resistance properties similar to the parent (base) metal being welded.

The electrodes for manual welding shall be low-hydrogen Type E55018-C3 (E8018-C3).

The electrode for flux core welding shall be Low Hydrogen E8XTX-Ni1 (E7XT8-Ni1).

Arc strikes and tack welds, which will not be incorporated into the final welds as shown on the approved drawings, will not be permitted. Tack welds are to be not longer than 70 mm (2 3/4"), not closer than 500 mm (20") and no larger than 5mm (3/16").

- .3 Exact shop welding procedures, including weld sizes, stress relief treatment, types of electrodes, flux, current, and sequence of welding shall be submitted for the Engineer's review. Any standard sheets submitted for review shall be marked up to indicate clearly the type of weld to be used for every particular application. The welding procedures used shall be indicated on Fabricator's shop drawings by cross-referencing them with the standard sheets submitted.

All joints and procedures shall be approved by the Canadian Welding Bureau in accordance to CSA W59 or AWS D1.5.

- .4 All welding shall be done by Operators qualified under the provisions of the CSA Standard W47.1, Division 1 or AWS D1.5.
- .5 Butt welds of tension flange plates shall be stress-relieved in accordance with procedure described in Clause 5.12 of CSA Standard W59 or Section 4.4 of AWS D1.5.
- .6 Fillet welds between flange and web plates and between end stiffeners and web plates will be NDT tested.

Flange and web butt welds will be inspected (after stress relieving when applicable) by approved radiographic and ultrasonic methods and approved before assembly of flanges to the web. Standards of acceptance for radiographic, ultrasonic or magnetic

particle examination of welds shall be as specified in CSA Standard W59, Clause 12.5 / AWS D1.5, Section 4.4.

Railway Company will arrange and pay for the radiographic, ultrasonic or magnetic particle tests, except that the cost of inspection of any welding repairs entailed in the fabrication will be at the expense of the steel fabricator.

## .5 Shear Connectors

- .1 Shear connectors shall be as specified and tested in accordance with AREMA Chapter 15, Clause 1.7.9.3.
- .2 Diameter, length and spacing of the shear connectors shall be as indicated on the drawings.
- .3 Shear connectors shall be as manufactured by Nelson Stud Welding Division of KSM of Canada Ltd., or approved equal.

## 2.2 Grating

- ~~.1 Grating for Inspection Catwalks shall be Standard Flowforge Steel Grating Type 30-102M, size of bearing bars 38mm x 3.2mm as manufactured by Fisher & Ludlow, or approved equal.~~
- ~~.2 Grating for Trainman's Walkways shall be Heavy Duty Flowforge Steel Grating Type HD-38-H4, size of bearing bars 38mm x 9.5mm at 60mm o/c and cross bars at 102mm o/c, as manufactured by Fisher & Ludlow, or approved equal. Supply of the grating shall include saddle clips and 13mm bolts.~~
- ~~.3 Grating panels shall be fully banded.~~
- ~~.4 Grating panels shall be welded to angle retainers.~~
- ~~.5 Grating shall be hot-dipped galvanized and cut to the dimensions shown on the drawings. All welds shall be wire brushed clean and coated with "Z.R.C. Cold Galvanizing Compound" supplied by Kerry Industrial Supplies, Agincourt, Ontario, or other approved liquid galvanizing material. The material shall be applied in strict accordance with Manufacturer's specifications.~~
- ~~.6 Gratings shall be fabricated and installed in such a manner that the cross bars in each grating runs continuously in the same direction.~~

## 2.3 Handrails

- .1 Handrails shall be of tubular round steel, hot-dipped galvanized after fabrication as detailed on the drawings.

## 2.4 Hot Dip Galvanizing

- .1 All steel except anchor bolts, where called for on the drawing as being hot-dip galvanized shall be executed after fabrication of the element and shall be in accordance with ASTM A123 and shall have a minimum mass of zinc coating of 610 g/m<sup>2</sup> (2 oz//ft<sup>2</sup>).
- .2 ASTM F1554 Anchor bolts shall be galvanized by the following methods:  
Grade 105: Zinc Hot Dip to ASTM A153 Class C
- .3 Galvanized nuts shall be tapped oversize according to ASTM A563 and shall meet the requirements of supplementary Requirement S1 of ASTM 563. Excess hot-dip galvanizing on threaded portions shall be removed by centrifuging or air blasting immediately upon withdrawal; flame chasing is prohibited.
- .4 Prior to galvanizing all steel components shall be surface prepared in accordance with SSPC-SP10.

## 2.5 Metallization

- ~~.1 The following areas shall be zinc metallized with a minimum coating of 0.25mm in accordance with AWS C2.23-03/SSPC-CS 23.00:~~
  - ~~.1 Girder ends, to the extent shown on the drawings,~~
  - ~~.2 Top surface and sides of the top flange, Deck Plate Girders only.~~

## 2.6 Painting of Metallized Surfaces

- ~~.1 Apply 2 coats of PPG Amercoat 385 to the metallized areas at the girder ends. Minimum dry film thickness per coat shall be 3 mils (75 microns). Color shall be Ameron RT1405 (Reddish Brown).~~

## 2.7 Identification of Span

- .1 Apply, where shown on the drawings, a 8" x 12" (200mm x 300mm) span identification plate. The plate shall be installed using two 3/8" (10mm) diameter stainless steel cap screws in accordance with Drawing TD-05-L1 attached to these specifications.
- .2 The plate and screws will be supplied by the Railway.

## 2.8 Fibre Optic Ductwork

- .1 Supply and deliver fibre optic ductwork on each side of the main girders as detailed. Fibre optic ducts shall be 4" x 4" fabricated from 14 gauge galvanized sheet steel as manufactured by Hovey Industries and



distributed by IEC Holden Inc., or approved equal. The ducts shall be supplied in minimum lengths of 3 feet.

- .2 Ducts shall be supplied with field assembly bolts required for a complete installation in the field by the Railway.
- .3 Ducts shall be supplied with removable covers permitting the installation of fibre optic cable.
- .4 At each main girder, at the end of the span the Fabricator shall supply two 45 degree elbows (one downward and one upward) in order to permit burial of the duct approximately 2 feet into the embankment.

## 2.9 Bearing Levelling Pads

- .1 The Fabricator shall supply and place levelling pads where indicated on the drawings.
- .2 Levelling pads shall be laminated fabric rubber such as Fabreeka, Sorbtex or equivalent.
- .3 The levelling pads, where indicated, shall be fully adhered with a waterproof adhesive compatible with the pad.

## PART 3 - EXECUTION

### 3.1 Work Schedule

- ~~.1 **PROVIDE WITH THE TENDER A DETAILED WORK SCHEDULE** in increments of not more than one week. The detailed schedule shall be in a clear, concise, bar chart form and shall clearly indicate the fabrication periods and sequences of operations of each item of work in sufficient detail so the Engineer can determine the feasibility of the program and monitor the progress of the work. A copy of the acceptable work schedule form is attached to these specifications. The work schedule must be submitted with your quotation in order for your tender to be considered.~~
- ~~.2 When establishing the work schedule conform to the mandatory delivery date called for in the "Delivery" clause of the "Instructions to Bidders".~~
- ~~.3 Interim reviews of work progress based on schedule submitted by the Fabricator will be conducted as decided by the Engineer and schedule updated by the Fabricator in conjunction with approval of the Engineer.~~
- ~~.4 Delivery date must be met otherwise damages will be assessed by the Railway and charged to the Fabricator.~~

### 3.2 Fabrication Procedures and Tolerances

- .1 Fabrication procedures and tolerances shall be in accordance with Chapter 15, Part 3 of the AREMA Manual, unless stated otherwise in the specifications or on the drawings.
- .2 Shearing of plates shall only be permitted on edges of secondary material which will be welded; all edges of primary material must be machine flame cut or, if sheared, must be planed to a depth of  $\frac{1}{4}$ " (6mm).
- .3 Flange material preheating:
  - .1 Flange material thicker than  $1\frac{1}{2}$ " (40mm) and up to  $2\frac{3}{8}$ " (60 mm) shall be preheated to 150 deg F (65 deg. C) before flame cutting or welding.
  - .2 Flange material thicker than  $2\frac{3}{8}$ " (60 mm) shall be preheated to 225 deg. F (107 deg C) before flame cutting or welding.
- .4 All holes must be drilled from the solid or sub-punched a maximum  $1\frac{1}{16}$ " (18 mm) diameter and reamed.
- .5 Steel templates with hardened bushings will not be required for drilling holes in gussets and bracing with 4 holes or less.
- .6 Camber in girders shall be as indicated on the drawings. Deviation from camber in girders shall not be permitted.
- .7 Bottom flanges of girders over bearings shall be true and square. Maximum measured deviation at outside edge of bearing plates shall not exceed  $\frac{1}{25}$ " (1mm).
- .8 Deviations from straightness of main girders shall not exceed  $\frac{1}{8}$ " (3 mm).
- .9 Submit request for approval of flange splices, other than as called for on the drawings, with tendering documents.
- .10 Field connections and bolts for deck joint cover plate:
  - .1 Supply all bolts for shop and field connections as called for on the drawings.
  - .2 The Fabricator shall supply additional high strength connection bolts for field assembly. The number of field high strength bolts of each size and length furnished in excess of the nominal number required shall be 5% plus 5. The number of nuts and washers of each size and type furnished in excess of the nominal number required shall be 5%.
  - .3 All shop and field connections shall be slip-resistant (friction-type) using High Strength bolts.
  - .4 Bolts shall conform to ASTM Specification A325 Type 3, with matching nuts to ASTM A563-C3 Grade DH3 and washers to ASTM F436 Type 3.

- .5 Contact surfaces shall be thoroughly cleaned of all weld deposits and dirt prior to assembly of components in order to obtain the desired friction component.
- .6 Tightening of high strength bolts shall be executed by the turn-of-nut method as specified under Chapter 15, Part 3, Clause 3.2.3 of the AREMA.
- .11 Assembly:
  - .1 For spans called for on the drawing or specification as being shipped completely assembled:
    - .1 Spans shall be shipped entirely shop assembled complete with bearing assemblies except for the following items:
      - .1 Walkway brackets shall be bolted to the spans in the field by others.
      - .2 Grating shall be secured to the brackets in the field by others.
      - .3 Railings shall be shop assembled in units for each span.
      - .4 Deck joint cover plates shall be installed in the shop to ensure a snug fit along the profile of the deck plate and shall be match marked and supplied loose for installation in the field by the Railway.
      - .5 Cap beam connection plates and filler plates shall be bolted to cap beams as indicated.
  - .2 For spans called for in the drawing or specification as being shipped knocked down:
    - .1 Shop assembly of spans shall ensure good fit of all parts, including bearings, and match marking of all parts. Ship completely knocked down for assembly in the field as follows:
      - .1 Diaphragms shall be supplied with connection angles loosely bolted.
      - .2 Floor beams to be connected to girders shall be supplied with connection angles loosely bolted.
      - .3 All other floor beams shall be supplied loose with bolts for connecting in the field by others.
      - .4 Gusset plates and connecting angles shall be permanently bolted to the girders.
      - .5 Walkway brackets and grating shall be supplied loose.
      - .6 Railings shall be shop assembled in units for each span.
      - .7 Deck joint cover plates shall be installed in the shop to ensure a snug fit along the profile of the deck plate and shall be match marked and supplied loose for installation in the field by the Railway.
  - .3 For inspection purposes, all bolts must have their snug tight positions marked by the Fabricator prior to final tightening.
  - .4 All remaining miscellaneous steel pieces should be bundled and clearly marked as called for on the identification of pieces drawing.

- .12 Cleaning:
  - .1 Commercial blast clean inside and outside of main girders and its connections prior to the assembly.
  - .2 Commercial blast clean outside of main girders after assembly has been completed.
  - .3 Commercial blast cleaning shall be executed in accordance with SSPC-SP6.
  - .4 Remove heavy deposits of oil or grease by Solvent Cleaning to SSPC-SP1.

### 3.3 Inspection

- ~~.1 CN shall arrange for an additional inspection by an independent inspection firm under a separate contract. This will be in addition to the Fabricator's Quality Assurance Program referred to herein.~~
- .2 The Fabricator shall notify CN and the Inspector of the scheduled date for beginning fabrication.
- .3 The Fabricator shall perform the inspections to verify that welds meet the quality requirements of the current edition of the CSA Standard W59 (AWS D1.5).
  - .1 All non-destructive testing performed by the Fabricator shall be done by personnel qualified under CSA Standard W59 (AWS D1.5).
  - .2 The Fabricator shall submit to the Engineer, in triplicate, copies of all inspections and weld testing reports.
  - .3 Butt welds in flange and web joints are to be completed, inspected, and accepted before the flange to web tee joint is made.
  - .4 Welds requiring repairs shall be retested after repairs are made, at the expense of the Fabricator.
- .4 Non-destructive testing to be arranged and paid for separately by CN:
  - .1 All welds shall be visually inspected.
  - .2 All butt welds in flange splices in tension zones shall be Radiographic Tested (RT) inspected 100% after stress relieving.
  - .3 All other butt-welds in flange and web splices shall be 100% RT.

- .4 All flange to web fillet welds are to be Magnetic Particle Tested (MT) 50% concentrated at the centre of the girders, at every stop and start location and repair location.
- .5 All bearing stiffener to flange welds of girders and beams shall be Ultrasonically Tested (UT) tested 100%.
- .6 All joints to be RT inspected will be ground flush on both sides, and shall be free of paint, scale and grease. The direction of grinding shall be perpendicular to the length of the weld.

### 3.4 Weight Information

- .1 The TOTAL WEIGHT of each fully assembled span shall be indicated at the end of the bottom flange of the span. The weight shall be stencilled on the material with a minimum 100 mm (4") high yellow waterproof letters. The weight shall be indicated in Imperial units.
- .2 For all members or components that are shipped unattached to the spans, these members shall show the weight of these individual members or components on a metal tag attached thereto.

### 3.5 Protective Blocking

- .1 Provide protective blocking for lifting and transportation. Exercise care during fabrication and transportation so as not to damage span and, in particular, to avoid notches to edges of members, which may cause cracks due to fatigue stresses.
- .2 The use of welded attachments of any type, the field drilling or burning of holes, in any member, for shipping, or any other purpose is strictly forbidden.
- .3 Bolts shall not be loosened or removed from attachments in order to facilitate shipping.

### 3.6 Loading for Shipment

- .1 Each span should be marked and tagged indicating the Span Number.
- .2 Mark end of girder to identify which end will be pointing west or north when erected in the bridge by marking "West" or "North" on the top of the top flange at the end of each girder.
- .3 Loading on the rail cars will be done with the West or North ends of all spans pointing to the same end of the rail car.

- .4 The Fabricator shall supply and install the necessary blocking to fully support the span during shipment.
- .5 Four (4) weeks prior to shipping, the fabricator shall provide CN for review and approval four (4) copies of loading and blocking scheme drawings, which shall be stamped and signed by a Professional Engineer.
- .6 The Fabricator shall supply all material (including bolsters or swivel blocks under spans) and labour required to load and block the spans or girders to meet the Association of American Railroads (AAR) open top loading rule requirements.
  - .1 Load securements shall be capable of withstanding 3 times the object weight in the longitudinal direction, and 2 times the object weight in the lateral and vertical directions.
  - .2 Tie downs shall consist of 1" minimum diameter rods or plates only. The use of tie down cables or wires is strictly prohibited.
  - .3 Spans or girders over 50 feet in length can be shipped on flat cars and the fabricator shall then request flat cars from CN's customer service when undertaking necessary transport arrangements.
  - .4 For spans being shipped knocked down, the fabricator shall load and block each main girder individually on separate railcars.
  - .5 Spans or girders are to be shipped in the vertical position.
- .7 All field connection bolts, nuts, and washers shall be packed in 5-gallon (20 litre) metal cans and clearly labelled. The label will show mile and subdivision, the type and quantities of fasteners each can contains and the name and address of the receiver. The cans shall be strapped to a wooden pallet.
- .8 Walkway grating panels shall be strapped in bundles of 5 or 10 pieces with steel strapping. The steel strapping must be cushioned so as not to come in direct contact with the grating panel.
- .9 Walkway support structure materials shall be strapped to wooden pallets or shipped in steel drums or shall be strapped in bundles of not more than 2000 pounds each.
- .10 Shipping instructions shall accompany the bill of loading to ensure that the spans arrive on site, pointing in the correct direction for erection.
- .11 The Fabricator shall obtain a clearance for dimensional loads from the Engineer prior to shipment of the span(s).

### 3.7 **Identification of Pieces**

- .1 All members or components shall be identified on a metal tag attached thereto.
- .2 The metal tag shall have the following information:
  - .1 Bridge location (Mileage and Subdivision)

- .2 "Mark" as indicated on the drawings.
- .3 "Weight" in lb. of the individual members
  
- .3 The metal tags shall be have the following characteristics:
  - .1 Tag format type no. 90, 18 gauge
  - .2 Dimension: 2 1/2 x 2 3/4"
  - .3 Tag information shall be engraved with min. 1/2" high letters.
  - .4 Metal bands shall be used to attach the tags to the components.

\*\*\*\*\***END OF SECTION**\*\*\*\*\*

**LAKE COUNTY DIVISION OF TRANSPORTATION  
 TRAFFIC SIGNAL SPECIAL PROVISIONS**

**Effective: January 1, 2013**

All work and equipment performed and installed under this Contract shall be governed by and shall comply with:

SPECIFICATION	ADOPTED/DATED
<b>The State of Illinois            "Standard Specifications for Road and Bridge Construction"            referred to as "Standard Specifications"</b>	<b>Latest Edition</b>
<b>The State of Illinois            "Manual on Uniform Traffic Control Devices for Streets and            Highways,"            referred to as "MUTCD"</b>	<b>Latest Edition</b>
<b>The National Electrical Code            referred to as "NEC"</b>	<b>Latest Edition</b>
<b>The National Electrical Manufacturers Association            (All publications for traffic control items)            referred to as "NEMA"</b>	<b>Latest Edition</b>
<b>The International Municipal Signal Association            ("Official Wire &amp; Cable Specifications Manual,")            referred to as "IMSA"</b>	<b>Latest Edition</b>
<b>The Institute of Transportation Engineers            Technical Report No. 1,            (A Standard for Adjustable Face Vehicular Traffic Control Heads)            referred to as "ITE"</b>	<b>Latest Edition</b>
<b>AASHTO "Standard Specifications"            Structural Supports for Highway Signs, Luminaires, and Traffic            Signals</b>	<b>Latest Edition</b>
<b>Supplemental Specifications and Recurring Special Provisions</b>	<b>Latest Edition</b>

The following Traffic Signal Special Provisions supplement the above specifications, manuals, and codes. In case of conflict with any part or parts of said documents, these Special Provisions shall take precedence and shall govern.

The following terms and acronyms are used:

- |                  |  |
|------------------|--|
| IDOT             | Illinois Department of Transportation      |
| District 1       | IDOT District 1                            |
| LCDOT            | The Lake County Division of Transportation |
| Engineer         | The Resident Engineer                      |
| Traffic Engineer | The County Traffic Engineer – LCDOT        |



The intent of these Special Provisions is to prescribe the materials and construction methods commonly used in traffic signal installations. All material furnished shall be new. The locations and the details of all installations shall be indicated on the plans or as directed by the Engineer.

The work performed under this contract shall consist of furnishing and installing all traffic signal work as specified on the plans and as specified herein in a manner acceptable and approved by the Engineer.

**SUBMITTALS.**

Revise Article 801.05 of the Standard Specifications to read:

General requirements include:

- a. All material approval requests shall be submitted at the preconstruction meeting.
- b. Product data and shop drawings shall be assembled by pay item. Only the top sheet of each pay item submittal will be stamped by the LCDOT Traffic Department with the review status, except shop drawings for mast arm pole assemblies will be stamped with the review status on each sheet.
- c. Four complete copies of the manufacturer's descriptive literatures and technical data for the traffic signal materials. If the literature contains more than one item, the Contractor shall indicate which item or items will be furnished.
- d. Seven complete copies of the shop drawings for the mast arm assemblies and poles, and the combination mast arm assemblies and poles showing, in detail, the fabrication thereof and the certified mill analyses of the materials used in the fabrication, anchor rods, and reinforcing materials.
- e. Partial or incomplete submittals will be returned without review.
- f. Certain non-standard mast arm poles and structures will require additional review from IDOT's Bureau of Bridges and Structures. Examples include special mast arms and non-standard length mast arm pole assemblies. The contractor shall account for the additional review time in their schedule.
- g. The contract number or permit number, project location/limits and corresponding pay code number must be on each sheet of correspondence, catalog cuts and mast arm poles and assemblies drawings.
- h. Where certifications and/or warranties are specified, the information submitted for approval shall include certifications and warranties. Certifications involving inspections, and/or tests of material shall be complete with all test data, dates, and times.
- i. 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 CORRECTED', 'NOT APPROVED', or 'RESUBMIT'. 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 Engineer's approval thereof. The Contractor must still be in full compliance with contract and specification requirements.

- j. All submitted items reviewed and marked 'APPROVED AS CORRECTED', 'NOT APPROVED', or 'RESUBMIT' are to be resubmitted in their entirety, unless otherwise indicated within the submittal comments., with a disposition of previous comments to verify contract compliance at no additional cost to the contract.
- k. Exceptions to and deviations from the requirements of the Contract Documents will not be allowed. It is the Contractor's responsibility to note any deviations from Contract requirements at the time of submittal and to make any requests for deviations in writing to the Engineer. In general, substitutions will not be acceptable. Requests for substitutions must demonstrate that the proposed substitution is superior to the material or equipment required by the Contract Documents. No exceptions, deviations or substitutions will be permitted without the approval of the Engineer.

### **MARKING PROPOSED LOCATIONS**

Revise "Marking Proposed Locations for Highway Lighting System" of Article 801.09 to read "Marking Proposed Locations for Highway Lighting System and Traffic Signals."

### **INSPECTION OF ELECTRICAL SYSTEMS**

Add the following to Article 801.10 of the "Standard Specifications":

All cabinets, including temporary traffic signal cabinets, shall be assembled by an approved equipment supplier in IDOT District 1. LCDOT reserves the right to request that any controller and cabinet be tested at an IDOT District 1 approved equipment supplier's facility prior to field installation. Such testing will be at no extra cost to the contract. All permanent or temporary "railroad interconnected" controllers and cabinets, shall be new, built, tested and approved by the controller equipment vendor, in the vendor's IDOT District 1 approved facility, prior to field installation. The vendor shall provide the technical equipment and assistance as required by the Engineer to fully test this equipment.

### **MAINTENANCE AND RESPONSIBILITY**

Revise Article 801.11 of the "Standard Specifications" to read:

- a. Existing traffic signal installations and/or any electrical facilities at locations included in this contract may be altered or reconstructed totally or partially as part of the work on this contract. The Contractor is hereby advised that all traffic control equipment presently installed at these locations may be the property of the State of Illinois, Department of Transportation, Division of Highways, County, Private Developer, or the Municipality in which it is located. Once the Contractor has begun any work on any portion of the project, all traffic signals within the limits of this contract or those which have the pay item MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION, TEMPORARY TRAFFIC SIGNAL INSTALLATION, and/or MAINTENANCE OF EXISTING FLASHING BEACON INSTALLATION, shall become the full responsibility of the Contractor. The Contractor shall supply the Engineer and the County's Traffic Signal Maintenance Contractor two 24-hour emergency contact names and telephone numbers. The Contractor shall provide sufficient qualified personnel to respond to all notifications of malfunctions on a round-the-clock basis (24 hours a day, 7 days a week). The Contractor is required to keep a time and date log of all maintenance items, including the time of the initial report, the response time, and the time of final permanent repair. The Contractor shall provide this information to the Engineer, upon request.

- b. When the project has a pay item for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION, TEMPORARY TRAFFIC SIGNAL INSTALLATION, and/or MAINTENANCE OF EXISTING FLASHING BEACON INSTALLATION, the Contractor must notify the Traffic Engineer at **(847) 377-7000** of their intent to begin any physical construction work on the project or any portion thereof. This notification must be a minimum of seven (7) working days prior to the start of construction to allow sufficient time for an inspection of the existing traffic signal installation(s) and the transfer of maintenance to the Contractor. If work is started prior to the inspection, maintenance of the traffic signal installation(s) will be immediately transferred to the Contractor without an inspection. The Contractor shall then become responsible for repairing or replacing all equipment that is not operating properly or is damaged at no cost to the owner of the traffic signal. Final repairs to or the replacement of damaged equipment must meet the approval of the Engineer at the time of final inspection or the traffic signal installation will not be accepted.
- c. Contracts that don't include traffic signal installations or modifications, but do include pay items for milling or pavement patching which may result in the destruction of traffic signal loops, do not require maintenance transfer. These contracts do require a notification of intent to work and an inspection. A minimum of seven (7) working days prior to the loop removal, the Contractor shall notify the Traffic Engineer at **(847) 377-7000**, at which time arrangements will be made to adjust the traffic controller timing to compensate for the absence of detection.
- d. The Contractor is advised that the existing and/or temporary traffic signal installation must remain in operation during all construction stages, except for the most unavoidable down time. Any plan to shutdown the traffic signal installation for a period exceeding fifteen (15) minutes must receive prior approval from the Engineer. Approval to shutdown the traffic signal installation will only be granted during the hours of 9:00 A.M. to 3:00 P.M. on weekdays. Shutdowns will not be allowed during inclement weather, weekends or holiday periods.
- e. The Contractor shall be fully responsible for the safe and efficient operation of the traffic signals. Any inquiry, complaint or request by the Division, the County's Traffic Signal Maintenance Contractor or the public, shall be investigated and repairs started. The Contractor shall restore service and complete permanent repairs in accordance with the following Repair Timetable. Failure to provide this service will result in liquidated damages of \$500 per day per occurrence. The Traffic Engineer reserves the right to assign any work not completed within this timeframe to the County's Traffic Signal Maintenance Contractor. All costs associated to repair this uncompleted work shall be the responsibility of the Contractor. Failure to pay these costs to the Traffic Signal Maintenance Contractor within one month after the incident will result in additional liquidated damages of \$500 per month per occurrence. Unpaid bills will be deducted from the cost of the Contract. The County's Traffic Signal Maintenance Contractor may inspect any signaling device on the Division's highway system at any time without notification.

Immediately after performing any work related to a signal maintenance item (troubleshooting, temporary repair, permanent repair, etc.) the Contractor shall contact the Lake County PASSAGE Transportation Management Center (TMC) at **(847) 377-7000**.

Unless specifically stated to the contrary, all items shall be repaired within the time frame described in the Repair Timetable. The times listed are noncumulative. Any repairs not

specifically covered in the Repair Timetable, or described elsewhere, shall be completed within a time frame matching the most similar line item in the Repair Timetable.

**REPAIR TIMETABLE**  
 (non cumulative)

<u>ITEM</u>	<u>RESPONSE TIME</u>	<u>SERVICE RESTORATION</u>	<u>PERMANENT REPAIRS</u>
<b>KNOCKDOWNS/FAILURE/DAMAGE:</b>			
Cabinet	1 hr	24hrs	2 wks
Controller (Local or Master)	1 hr	24hrs	2 wks
Detector Loop	1 hr	n.a.	3 wks
Loop Detector/Amplifier	1 hr	4 hrs	2 wks
MVP Sensor	1 hr	4 hrs	2 wks
PTZ Camera	2 hrs	48 hrs	2 wks
Detector Interface Card/Mini Hub	1 hr	4 hrs	2 wks
Modem	2 hrs	NWD	2 wks
Load Switch	1 hr	2 hrs	2 hrs
Signal Head/Lenses	1 hr	2 hrs	NWD
Pole/Mast Arm	1 hr	2 hrs	ENG
Cabling/Conduit	1 hr	4 hrs	ENG
Interconnect/Communication	1 hr	NWD	ENG
Graffiti/Advertising	NWD	NWD	NWD
Telemetry, Electrical	1 hr	2 hrs	NWD
Ethernet Switches/Video Encoders	1 hr	48 hrs	2 wks
Highway Advisory Radio (HAR)	1 hr	48 hrs	2 wks
Indicators/switches/LEDs/displays	NWD	n.a.	2 wks
Outages not covered elsewhere	1 hr	2 hrs	NWD
Filter/Cleanliness/fans/thermostat	NWD	NWD	n.a.
Misalignment (conflicting)	1 hr	2 hrs	NWD
Misalignment (non-conflicting)	2 hrs	4 hrs	NWD
<b>COMPLAINTS/CALLS/ALARMS:</b>			
Timing/Phasing/Programming	1 hr	2 hrs	ENG
Coordination Alarm/Cycle Fail	NWD	ENG	ENG
Controller Alarm/Status Change	1 hr	NWD	1 wk
Detector Alarm/Status change	NWD	NWD	ENG
CMU Flash/Local Flash	1 hr	2 hrs	1 wk
Door Open/Maint. Req.	2 hrs	4 hrs	NWD

**LEGEND:** hr=hour, hrs=hours, NWD=next working day, wk=week, wks=weeks, ENG=acceptable to Engineer, days=calendar days, n.a.=not applicable

**DAMAGE TO TRAFFIC SIGNAL SYSTEM**

Revise Article 801.12(b) of the "Standard Specifications" to read:

Any damaged equipment or equipment not operating properly from any cause whatsoever shall be repaired and/or replaced with new equipment meeting current traffic signal specifications and provided by the Contractor at no additional cost to the Contract and/or owner of the traffic signal system, to the satisfaction of the Engineer. Final repairs or replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection; otherwise the

traffic signal installation will not be accepted. Cable splices outside the controller cabinet shall not be allowed.

Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, and peripheral equipment, damaged or not operating properly from any cause whatsoever, shall be the responsibility of the municipality or the Automatic Traffic Enforcement company per Permit agreement.

**TRAFFIC SIGNAL INSPECTION (TURN-ON)**

Revise Article 801.15(b) of the "Standard Specifications" to read:

It is LCDOT's intent to have all electric work completed and the equipment field-tested by the vendor, prior to LCDOT's "turn-on" field inspection. The Contractor must have all traffic signal work completed and the electrical service installation connected by the utility company prior to requesting an inspection and "turn-on" of the traffic signal installation. In the event the Traffic Engineer determines that the work is not complete and that the inspection will require more than two (2) hours to complete, the inspection shall be canceled and the Contractor will be required to reschedule at another date.

The 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 Traffic Engineer at **(847) 377-7000** a minimum of seven (7) working days prior to the time of the requested inspection. LCDOT will not grant a field inspection until the Contractor provides notification that the equipment has been field tested, and the intersection is operating according to contract requirements.

Signal indications being tested shall match the lane configurations and markings at the intersection. If any conflicting signal indications are visible to motorist or pedestrians while testing, Contractor shall be responsible to provide police officer(s) to direct traffic. In addition, the Contractor shall provide a representative from the control equipment vendor's office to attend the traffic signal inspection for both permanent and temporary traffic signal "turn-ons". Upon demonstration that the signals are operating properly and that all work has been completed in accordance with the contract and to the satisfaction of the Traffic Engineer, the Traffic Engineer will then allow the signals to be placed in continuous operation. The Agency that is responsible for the maintenance of each traffic signal installation will reassume the traffic signal maintenance upon acceptance by the Traffic Engineer.

The Lake County Division of Transportation requires the following from the Contractor at Traffic Signal "turn-ons":

1. One (1) set of as-built signal plans.
2. One (1) letter from the electrical contractor certifying that all material and equipment provided and installed as part of the project is in accordance with the approved catalog cuts and shop drawings.
3. A knowledgeable representative of the controller equipment supplier shall be present at the traffic signal "turn-on". The representative shall be knowledgeable concerning the cabinet design and the controller functions.
4. One (1) CD or electronic version of the cabinet box prints.

5. One (1) copy of the operation and service manuals for the signal controller and the associated control equipment.
6. Five (5) copies (11" x 17") of the cabinet wiring diagrams.
7. Five (5) copies of the traffic signal installation cable log.
8. All manufacturer and contractor warranties and guarantees required by Article 801.14.

Acceptance of the traffic signal equipment by LCDOT shall be based on the inspection results at the traffic signal "turn-on". If approved, the traffic signal acceptance shall be given verbally at the "turn-on" inspection, followed by written correspondence from the Traffic Engineer. The Contractor shall be responsible for all traffic signal equipment and associated maintenance thereof until LCDOT acceptance is granted. Any "punch list" work remaining after the installation is accepted shall be completed within thirty (30) calendar days of the acceptance date. If this work is not completed within thirty days, LCDOT reserves the right to have the work completed by others at the Contractor's expense. This cost will be in addition to Liquidated Damages for Untimely Work.

The Contractor shall furnish all equipment and/or parts to keep the traffic signal installation operating.

All cost of work and materials required to comply with the above requirements shall be included in the pay item bid prices, under which the subject materials and signal equipment are paid, and no additional compensation will be allowed. Materials and signal equipment not complying with the above requirements will be subject to removal and disposal at the Contractor's expense.

#### **LOCATING UNDERGROUND FACILITIES**

Revise Section 803 of the "Standard Specifications" to read:

Contractor requests for equipment locates will be granted only once prior to the start of the contract. Additional requests shall be at the expense of the Contractor. The location of underground traffic facilities does not relieve the Contractor of their responsibility to repair any item(s) damaged during the construction, at his/her own expense.

Locate requests should be directed to LCDOT's Traffic Signal Maintenance Contractor or to the LCDOT Traffic Engineering Department at (847) 377-7000.

The exact location of all utilities shall be field verified by the Contractor before the installation of any components of the traffic signal system. For locations of utilities call J.U.L.I.E. at **1-800-892-0123**. For the locations of some utilities, other Agencies or Municipalities may need to be contacted.

#### **MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION**

Revise Section 850 of the "Standard Specifications" to read:

The Contractor shall not be required to pay the energy charges for the operation of the existing traffic signal installation. Full maintenance responsibility shall start as soon as the Contractor begins any physical work on the Contract or any portion thereof.

The Contractor shall have electricians on staff with IMSA Level II certification to provide signal maintenance.

This item shall include maintenance of all traffic signal equipment at the intersection, including cameras, emergency vehicle pre-emption equipment, master controllers, telephone service installations, communication equipment, communication cables and conduits to adjacent intersections.

The maintenance shall be according to Article 850 of the "Standard Specifications", and the following contained herein.

The Contractor shall check all controllers every two (2) weeks, which will include visually inspecting all timing intervals, relays, detectors, and pre-emption equipment to ensure that they are functioning properly. This item includes, as routine maintenance, all portions of the emergency vehicle pre-emption system. The Contractor shall maintain in stock at all times a sufficient amount of materials and equipment to provide effective temporary and permanent repairs.

The Contractor shall provide immediate corrective action when any part or parts of the system fail to function properly. Two (2) far side heads facing each approach shall be considered the minimum acceptable signal operation pending permanent repairs. When repairs at a signalized intersection require that the controller be disconnected, and power is available, the Contractor shall place the traffic signal installation on flashing operation. The signals shall flash RED for all directions unless a different indication has been specified by the Engineer. The Contractor shall be required to place at least 1 STOP sign (R1-1-36) at each approach of the intersection as a temporary means of regulating traffic. At approaches where a yellow flashing indication is necessary, as directed by the Engineer, STOP signs will not be required. The Contractor shall furnish and equip all their signal maintenance vehicles with a sufficient number of STOP signs as specified herein. The Contractor shall maintain a sufficient number of spare STOP signs in stock at all times to replace those which may be damaged or stolen.

The Contractor shall provide the Engineer with a 24-hour telephone number for traffic signal maintenance. The Contractor, or his representative, shall be available on a 24-hour basis to respond to emergency calls by the Traffic Engineer or other parties.

Traffic signal equipment which is lost or not returned to the County for any reason shall be replaced with new equipment meeting the requirements of these Specifications.

The Contractor shall respond to all emergency calls from the County or others within one hour after notification and provide immediate corrective action. When equipment has been damaged or becomes faulty beyond repair, the Contractor shall replace it with new and identical equipment. The cost of furnishing and installing the replaced equipment shall be borne by the Contractor at no additional charge to the County. The Contractor may institute action to recover damages from a responsible third party. If at any time the Contractor fails to perform all work as specified herein to keep the traffic signal installation in proper operating condition or if the Engineer cannot contact the Contractor's designated personnel, the Engineer shall have the County's Traffic Signal Maintenance Contractor perform the maintenance work required. The County's Traffic Signal Maintenance Contractor shall bill the Contractor for the total cost of the work. The Contractor shall pay this bill within thirty (30) days of the date of receipt of the invoice or the cost of such work will be deducted from the amount due the Contractor. The Contractor

shall allow the County's Traffic Signal Maintenance Contractor to make reviews of the existing traffic signal installation that has been transferred to the Contractor for maintenance.

The Engineer may require the Contractor to transfer maintenance of a signal back to the County's Traffic Signal Maintenance Contractor (or other electrical contractor) for a short time. This may become necessary due to other signal projects in the area, or if the County needs to perform work at the signal. Any costs incurred by the Contractor for maintenance transfer inspections of this type shall be included in cost of pay item MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION.

Any proposed activity in the vicinity of a highway-rail grade crossing must adhere to the guidelines set forth in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) regarding work in temporary traffic control zones in the vicinity of highway-rail grade crossings which states that lane restrictions, flagging, or other operations shall not create conditions where vehicles can be queued across the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.

Basis of Payment. This work shall be paid for at the contract unit price each for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION.

#### **TEMPORARY TRAFFIC SIGNAL INSTALLATION**

Add the following to Section 890 of the "Standard Specifications":

Only an approved equipment vendor will be allowed to assemble the temporary traffic signal cabinet. Also, an approved equipment vendor shall assemble and test a temporary railroad traffic signal cabinet. (Refer to the "Inspection of Electrical Systems" specification) A representative of the approved control equipment vendor shall be present at the temporary traffic signal turn-on inspection.

Only controllers compatible with "Centrac" software (NTCIP) or "Aries" software, currently in use by LCDOT, will be approved for use at temporary signal locations. Controller software compatibility requirements are based upon the controller's location in the communication system, and shall be as shown on the plans. All controllers used for temporary traffic signals shall be fully-actuated NEMA microprocessor based with RS232 data entry ports compatible with existing monitoring software, installed in NEMA TS-1 or TS-2 cabinets with 8 phase back panels, capable of supplying 255 seconds of cycle length and individual phase length settings up to 99 seconds. On projects with one lane open and two way traffic flow, such as bridge deck repairs, the temporary bridge signal controller shall be capable of providing an adjustable all red clearance setting of up to 30 seconds in length. All controllers used for temporary traffic signals shall meet or exceed the requirements of Section 857 of the "Standard Specifications" with regards to internal time base coordination and preemption.

All temporary traffic signal cabinets shall have a closed bottom made of aluminum alloy. The bottom shall be sealed along the entire perimeter of the cabinet base to ensure a water, dust and insect-proof seal. The bottom shall provide a minimum of two (2) 4-inch diameter holes to run the electric cables through. The 4-inch diameter holes shall have a bushing installed to protect the electric cables and shall be sealed after the electric cables are installed.



The stand which supports the temporary traffic signal cabinet shall be constructed of lumber and plywood that has been pressure-treated to protect against rot, mold, and insects.

Grounding shall be provided for the temporary traffic signal cabinet meeting or exceeding the applicable portions of the National Electrical Code, Section 806 of the "Standard Specifications" and the "Grounding of Traffic Signal Systems" section of these special provisions.

All traffic signal head sections shall be twelve (12) inches. Traffic signal sections shall be LED with expandable view, unless otherwise approved by the Engineer. The temporary traffic signal heads shall be placed as indicated on the temporary traffic signal plan or as directed by the Traffic Engineer. The Contractor shall furnish enough cable slack to relocate heads to any position on the span wire or at locations illustrated on the plans for construction staging. The temporary traffic signal shall remain in operation during all signal head relocations. Each temporary traffic signal head shall have its own cable from the controller cabinet to the signal head.

All temporary traffic signal installations shall have vehicular detection installed as shown on the plans or as directed by the Engineer. Pedestrian push buttons shall be provided for all pedestrian signal heads/phases as shown on the plans or as directed by the Engineer. All approaches shall have vehicular detection provided by vehicle detection system as shown on the plans or as directed by the Engineer. The Contractor shall install, wire, and adjust the alignment of the video vehicle detection system in accordance to the manufacturer's recommendations and requirements. The Contractor shall be responsible for adjusting the alignment of the video vehicle detection system for all construction staging changes and for maintaining proper alignment throughout the project. A representative of the approved control equipment vendor shall be present and assist the contractor in setting up and maintaining the video vehicle detection system. An in-cabinet video monitor shall be provided with all video vehicle detection systems and shall be included in the item Temporary Traffic Signal Installation. When called for in the plans, the UPS cabinet shall be mounted to the temporary traffic signal cabinet and meet the requirements of UNINTERRUPTABLE POWER SUPPLY of these Special Provisions.

For temporary traffic signal installations within closed loop system(s), the controller shall be compatible with the existing traffic signal system master controller. The existing system interconnect is to be maintained as part of the Temporary Traffic Signal Installation specified on the plan. The interconnect shall be installed into the temporary controller cabinet as per the notes or details on the plans. Refer to the INTERRUPTION OF COMMUNICATION requirements described earlier. All labor and equipment required to install and maintain the existing interconnect shall be included in the cost of the item TEMPORARY TRAFFIC SIGNAL INSTALLATION.

All emergency vehicle priority equipment (light detectors, light detector amplifiers, confirmation beacons, etc.) as shown on the temporary traffic signal plans shall be provided by the Contractor. It shall be the Contractor's responsibility to contact the municipality or fire district to verify the brand of emergency vehicle priority equipment to be installed prior to the contract bidding. The equipment must be completely compatible with all components of signal equipment currently in use by the County. All light operated systems shall operate at a uniform rate of 14.035 hz  $\pm$ 0.002, or as otherwise required by the Engineer. All labor and material required to install and maintain the Emergency Vehicle Priority system shall be included in the cost of the item TEMPORARY TRAFFIC SIGNAL INSTALLATION.

When directed by the Engineer, this item shall also include operational items such as: controller database changes, timing changes, activation/deactivation of phases, relocation of signal heads, relocation / reconfiguration of detectors (microwave and/or video), and bagging / unbagging signal heads. On temporary traffic signal installations with detector loops, coilable non-metallic conduit shall be used for detector loop raceways from the saw-cut to 10 feet up the wood pole, unless otherwise shown on the plans. Coilable non-metallic conduit shall meet the requirements of NEC Article 343 and meet the requirements of COILABLE NON-METALLIC CONDUIT of the Special Provisions.

All existing street name and intersection regulatory signs shall be removed from existing poles and relocated to the temporary signal span wire. If new mast arm assemblies and posts are specified for the permanent signals, the signs shall be relocated to the new equipment at no extra cost.

The Contractor shall not be required to pay the energy charges for the operation of the existing traffic signal installation. If the installation replaces an existing signal, the Contractor shall not be required to pay the energy charges for the operation of the temporary traffic signal. The Contractor shall pay the energy charges for all other temporary traffic signal installations.

The Contractor shall furnish all control equipment for the temporary traffic signal(s) unless otherwise stated in the plans. On projects with multiple temporary traffic signal installations, all controllers shall be of the same manufacturer and model number with current software installed. Maintenance shall meet the requirements of the "Standard Specifications" and the "Maintenance of Existing Traffic Signal Installation" section of these special provisions. Maintenance of temporary signals and of the existing signals shall be included in the cost of this item. When temporary traffic signals are to be installed at locations where existing signals are presently operating, the Contractor shall be fully responsible for the maintenance of the existing signal installation as soon as he begins any physical work on any portion of the project. Maintenance responsibility of the existing signals shall be incidental to the item TEMPORARY TRAFFIC SIGNAL INSTALLATION. In addition, a minimum of seven (7) days prior to assuming maintenance of the existing traffic signal installation(s) under this contract, the Contractor shall contact the Traffic Engineer **(847) 377-7000** to request an inspection of the installation(s).

Temporary Traffic Signals for bridge projects shall follow the State Standards, "Standard Specifications", LCDOT Traffic Signal Special Provisions, and any plans for Bridge Temporary Traffic Signals included in the plans. The installation shall meet the above requirements for TEMPORARY TRAFFIC SIGNAL INSTALLATION. In addition, all electric cable shall be aerially suspended, at a minimum height of 18 feet, on temporary wood poles (Class 5 or better) of 45 feet minimum height. The signal heads shall be span-wire-mounted or bracket-mounted to the wood pole or as directed by the Engineer. The Controller cabinet shall be mounted to the wood pole or as directed by the Engineer. All approaches for temporary traffic signals for bridge projects shall have microwave vehicle sensors or video vehicle detection, as shown on the plans or as approved by the Engineer.

Basis of Payment: This work shall be paid for at the contract unit price each for TEMPORARY TRAFFIC SIGNAL INSTALLATION which shall include all costs for the installation, vehicular detection system, UPS, modification, maintenance, operational items, complete removal of the temporary traffic signal, and all material required to complete the work.

**REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT**

Add the following to Article 895.05 of the "Standard Specifications":

The traffic signal equipment, which is to be removed and will become the property of the Contractor, shall be disposed of by the Contractor outside the right-of-way at his/her own expense.

The Contractor shall safely store and arrange for delivery of all equipment that will remain the property of LCDOT. The Contractor shall deliver, unload and stack the equipment at the owner's facility, as directed by the Engineer, within 30 days of removing it from the traffic signal installation. The Contractor shall provide three (3) copies of a list of equipment that is to remain the property of LCDOT including model and serial numbers where applicable. The Contractor shall also provide a copy of the contract plan or special provisions showing the quantities and type of equipment to be delivered. Controllers and peripheral equipment from the same location shall be boxed together (equipment from different locations may not be mixed) and all boxes and controller cabinets shall be clearly marked or labeled with the location from which they were removed. The Contractor shall be responsible for the condition of the traffic signal equipment from the time of removal until the acceptance of a receipt written by the owner indicating that the items have been returned in good condition.

Traffic signal equipment which is lost or not returned to the County for any reason shall be replaced with new equipment meeting the requirements of these Specifications.

#### **RESTORATION OF WORK AREA**

Add to Section 801 of the "Standard Specifications":

Restoration of the traffic signal work area shall be included in the related pay item such as foundation, conduit, handhole, trench and backfill, etc. and no extra compensation shall be allowed. All roadway surfaces such as shoulders, medians, sidewalks, pavement, etc. shall be restored to match the previously existing conditions. All damage to mowed lawns shall be replaced with an approved sod, and all damage to unmowed fields shall be seeded, in accordance with Section 250 and 252 of the "Standard Specifications" respectively.

#### **CABINET NEATNESS**

The Contractor shall assure that all wiring and peripheral equipment in any new traffic signal cabinet is in a neat and orderly fashion that is acceptable to the Engineer. This applies to controller cabinets, master cabinets, railroad cabinets, communication cabinets, electrical service cabinets, or any other new cabinet called for in the project plans.

All conduit entrances into the cabinet shall be sealed with a pliable waterproof material. Electrical cables inside the cabinet shall be neatly trained along the base and back of the cabinet. Each conductor shall be connected individually to the proper terminal, and the spare conductors shall be bound into a neat bundle. All cables, including those for signals, vehicle detection, pushbuttons, emergency vehicle preemption, video transmission, and communication shall be neatly arranged and bundled within the cabinet to the satisfaction of the Engineer. Each cable shall be marked with an identification number which corresponds to the number and description on the cabinet cable log.

In the case of an existing cabinet that is being modernized or modified, the new cables being installed shall be trained, bundled and labeled to the satisfaction of the Engineer. When working inside an existing cabinet, the Contractor shall minimize disturbance to existing cables and cabinet wiring. Any existing cables and cabinet wiring disturbed by the Contractor shall be re-trained, bundled, and/or labeled to the satisfaction of the Engineer.

The County shall not accept maintenance of the traffic signal installations until the requirements of this specification are satisfied.

### **VENDOR REPRESENTATION**

Under this provision, the Engineer reserves the right to request the equipment vendor be present at the activation of new traffic equipment. Equipment covered under this provision includes signal heads, cabinets, controllers, amplifiers, preemption, video detection/monitoring, communication/transmission, fiber-optic/telemetry, radio, microwave, infrared, illuminated signs, streetlights, push buttons, lighted crosswalks, uninterruptable power supplies, and any other new equipment being installed and activated.

This provision is in addition to the requirement contained herein that the Contractor provide a representative from the control equipment vendor to attend the traffic signal inspection for both permanent and temporary traffic signal "turn-ons".

Any costs associated with equipment vendor representation shall not be paid for separately, but shall be included in the cost of the associated traffic equipment being activated. Any unforeseen costs incurred by the Contractor to provide this representation shall not be the responsibility of the County.

### **INTERRUPTION OF COMMUNICATION**

The interruption of communication with County equipment shall be kept to an absolute minimum. This includes communication such as controller telemetry, video transmission, camera control signals, Highway Advisory Radio, wireless interconnect, telephone (POTS/ISDN/DSL), high speed Internet, or any other County communication equipment. This provision applies to cable types including copper, multimode fiber optic, singlemode fiber optic, telephone cables, Internet cables, or any other cable used by the County to monitor and maintain its various signal and ITS equipment.

The contractor shall plan ahead, and shall stage his construction work accordingly, so that he can interrupt communication, and then restore communication, with as little down time as possible. For example, when a section of existing interconnect is being relocated, the new handholes and conduits should be installed prior to disconnecting the interconnect cable. The interconnect cable can then be disconnected, pulled out of the existing conduit, pulled through the new conduit, and re-connected. In addition, when an existing fiber optic cable is to be re-used, the contractor shall be prepared to immediately replace any fiber splices and/or terminations that become damaged.

Prior to disconnecting any LCDOT communication link, the contractor shall contact the Traffic Engineer for approval of his planned construction method.

### **ELECTRIC SERVICE INSTALLATION**

Revise Section 805 of the "Standard Specifications" to read:

Description. This work shall consist of all materials and labor required to install, modify, or extend the electric service installation. All installations shall meet the requirements of the details in the "IDOT District 1 Standard Traffic Signal Design Details" and applicable portions of the Specifications.

General. The electric service installation shall be the electric service disconnecting means and it

shall be identified as suitable for use as service equipment.

The electric utility contact information is noted on the plans and represents the current information at the time of contract preparation. The Contractor must request in writing for service and/or service modification within 10 days of contract award and must follow-up with the electric utility to assure all necessary documents and payment are received by the utility. The Contractor shall forward copies of all correspondence between the contractor and utility company to the Engineer of Traffic.

Materials.

- a. General. The completed control panel shall be constructed in accordance with UL Std. 508, Industrial Control Panel, and carry the UL label. Wire terminations shall be UL listed.
- b. Enclosures. All electrical service enclosures shall be UL 50, single door design, fabricated from Type 5052 H-32 aluminum or stainless steel. All seams shall be continuous welded and ground smooth, and the cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. Enclosures shall meet the following additional requirements:
  1. Pole Mounted Cabinet. The cabinet shall be NEMA Type 4X. Stainless steel screws and clamps shall secure the cover and assure a watertight seal. The cover shall be removable by pulling the continuous stainless steel hinge pin. The cabinet shall have an oil-resistant gasket and a lock kit shall be provided with an internal O-ring in the locking mechanism assuring a watertight and dust-tight seal. A minimum size of 14-inches high, 9-inches wide and 8-inches deep is required. The cabinet shall be channel mounted to a wooden utility pole using assemblies recommended by the manufacturer.
  2. Ground Mounted Cabinet. The cabinet shall be NEMA Type 3R with back panel. The cabinet frame and door shall be 0.125-inch thick, the top 0.250-inch thick, and the bottom 0.500-inch thick. The door and door opening shall be double flanged. The door shall be approximately 80% of the front surface, with a full-length tamperproof stainless steel .075-inch thick hinge bolted to the cabinet with stainless steel carriage bolts and nylock nuts. The locking mechanism shall be slam-latch type with a keyhole cover. A minimum size of 40-inches high, 16-inches wide, and 15-inches deep is required. The cabinet shall be mounted upon a square Type A concrete foundation as indicated on the plans. The foundation is paid for separately.
- c. Surge Protector. Overvoltage protection, with LED indicator, shall be provided for the 120-volt load circuit by the means MOV and thermal fusing technology. The response time shall be <5n seconds and operate within a range of -40C to +85C. The surge protector shall be UL 1449 Listed.
- d. Circuit Breakers. Circuit breakers shall be standard UL listed molded case, thermal-magnetic bolt-on type, with trip-free indicating handles. 120-volt circuit breakers shall have an interrupting rating of not less than 65,000 rms symmetrical amperes. Unless otherwise indicated, the main disconnect circuit breaker for the

traffic signal controller shall be rated 60 amperes, 120 V and the auxiliary circuit breakers shall be rated 10 amperes, 120 V.

- e. Fuses, Fuseholders and Power Indicating Light. Fuses shall be small-dimensional cylindrical fuses of the dual element time-delay type. The fuses shall be rated for 600 V AC and shall have a UL listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated voltage. The power indicating light shall be LED type with a green colored lens and shall be energized when electric utility power is present.
- f. Ground and Neutral Bus Bars. A single copper ground and neutral bus bar, mounted on the equipment panel shall be provided. Ground and neutral conductors shall be separated on the bus bar. Compression lugs, plus 2 spare lugs, shall be sized to accommodate the cables with the heads of the connector screws painted green for ground connections and white for neutral connections.
- g. Utility Services Connection. The Contractor shall notify the Utility Company marketing representative a minimum of 30 working days prior to the anticipated date of hook-up. This 30-day advance notification will begin only after the Utility Company marketing representative has received service charge payments from the Contractor. Prior to contacting the Utility Company for service connection, the service installation controller cabinet and cable must be installed for inspection by the Utility Company.
- h. Ground Rod. Ground rods shall be copper-clad steel, a minimum of 10-feet in length, and 3/4-inch in diameter. Ground rod resistance measurements to ground shall be 25 ohms or less. If necessary additional rods shall be installed to meet resistance requirements at no additional cost to the contract.

#### Installation

- a. General. The Contractor shall confirm the orientation of the traffic service installation and its door side with the Engineer, prior to installation. All conduit entrances into the service installation shall be sealed with a pliable waterproof material.
- b. Pole Mounted. Brackets designed for pole mounting shall be used. All mounting hardware shall be stainless steel. Mounting height shall be as noted on the plans or as directed by the Engineer.
- c. Ground Mounted. The service installation shall be mounted plumb and level on the foundation and fastened to the anchor bolts with hot-dipped galvanized or stainless steel nuts and washers. The space between the bottom of the enclosure and the top of the foundation shall be caulked at the base with silicone.

The service installation shall be paid for at the contract unit price each for SERVICE INSTALLATION of the type specified which shall be payment in full for furnishing and installing the service installation complete. The type A foundation which includes the ground rod shall be paid for separately. SERVICE INSTALLATION, POLE MOUNTED shall include the 3/4-inch grounding conduit, ground rod, and pole mount assembly. Any changes by the utility companies shall be approved by the Engineer and paid for as an addition to the contract according to Article 109.05 of the "Standard Specifications".

**GROUNDING OF TRAFFIC SIGNAL SYSTEMS**

Revise Section 806 of the "Standard Specifications" to read:

General. All traffic signal systems, equipment and appurtenances shall be properly grounded in strict conformance with the NEC. See "IDOT District One Standard Traffic Signal Design Details" for additional information.

The grounding electrode system shall include a ground rod installed in all foundations, and the service installation. An additional ground rod will be required at locations where measured resistance to ground exceeds 25 ohms. Ground rods are included in the associated pay items and will not be paid for separately. Testing shall be according to Article 801.13.

- a) The grounded conductor (neutral conductor) shall be white color-coded. This conductor shall be bonded to the equipment-grounding conductor only at the Electric Service Installation. All power cables shall include one neutral conductor of the same size.
- b) The equipment-grounding conductor shall be green color-coded. The following is in addition to Article 1087.01 of the "Standard Specifications".
  - 1) Equipment-grounding conductors shall be XLP insulated No. 6, unless otherwise noted on the plans, and bonded to the grounded conductor (neutral conductor) only at the electric service installation. The Earth shall not be used as the equipment-grounding conductor, and no splices shall be allowed in the cable between ground rods. The equipment-grounding conductor is paid for separately.
  - 2) Equipment-grounding conductors shall be bonded, using a UL listed grounding connector, to all traffic signal mast arm poles, traffic signal posts, pedestrian posts, pull boxes, handhole frames and covers and other metallic enclosures throughout the traffic signal wiring system, except where noted herein. A UL listed electrical joint compound shall be applied to all conductors' terminations, connector threads and contact points.
  - 3) All metallic and non-metallic raceways containing traffic signal circuit runs shall have a continuous equipment-grounding conductor, with the following exceptions: Raceways containing only detector loop lead-in circuits, circuits under 50 volts and/or fiber optic cable will not be required to include an equipment-grounding conductor.
- c) The grounding electrode conductor shall be similar to the equipment-grounding conductor in color coding (green) and size. The grounding electrode conductor is used to connect the ground rod to the equipment-grounding conductor and is bonded to ground rods via exothermic welding, UL listed pressure connectors, UL listed clamps or other UL approved listed means.

**GROUNDING EXISTING HANDHOLE FRAME AND COVER**

This work shall consist of all materials and labor required to bond the equipment-grounding conductor to the existing handhole frame and handhole cover. All installations shall meet the requirements of the details in the "IDOT District One Standard Traffic Signal Design Details" and applicable portions of the Specifications.

The equipment-grounding conductor shall be bonded to the handhole frame and to the handhole cover. Two (2) ½-inch diameter x 1 ¼-inch long hex-head stainless steel bolts, spaced 1.75-inches apart center-to-center shall be fully welded to the frame and to the cover to accommodate a heavy duty Listed grounding compression terminal (Bumdy type YGHA or approved equal).

The grounding compression terminal shall be secured to the bolts with stainless steel split-lock washers and nylon-insert locknuts.

Welding preparation for the stainless steel bolt hex-head to the frame and to the cover shall include thoroughly cleaning the contact and weldment area of all rust, dirt and contaminates. The Contractor shall assure a solid strong weld. The welds shall be smooth and thoroughly cleaned of flux and spatter. The grounding installation shall not affect the proper seating of the cover when closed.

Mechanical connections to the frame and cover may be approved in lieu of the listed welding procedures. The contractor shall submit a detailed plan indicating the proposed connectors and installation procedures for review and approval by the Engineer prior to the start of any work on this item.

The grounding cable shall be paid for separately.

Basis of Payment: This work shall be paid for at the contract unit price each for GROUNDING EXISTING HANDHOLE FRAME AND COVER, which shall be payment in full for grounding one handhole complete, regardless of the type of handhole or its location.

#### **UNDERGROUND CONDUIT**

The conduit shall meet the requirements of Section 810 of the "Standard Specifications", except for the following:

Delete Article 810.01 of the "Standard Specifications" and add the following:

Description. This item shall consist of furnishing and installing galvanized steel conduit, fittings and accessories in the ground, either pushed, trenched, plowed, or directionally bored, with fittings complete as specified herein and as shown on the Contract drawings.

Add the following to Article 810.04 of the "Standard Specifications":

Pavement, driveways, and curbs shall not be removed to install electrical conduits. All buried conduits shall be placed at a minimum depth of 30 inches, except under railroad tracks, where the minimum depth shall meet the written requirements of the railroad company. All conduit couplings shall be threaded. Conduits terminating in junction and pull boxes shall be terminated with galvanized steel bushings.

When empty conduit is installed for future traffic signal interconnects(s), the Contractor shall provide a pull line within the conduit.

Revise Article 810.07 of the "Standard Specifications" to read:

Basis of Payment: This work will be paid for at the contract unit price per foot for UNDERGROUND CONDUIT of the type and size specified, which price shall be payment in full for furnishing and installing the conduit either pushed, trenched, plowed, or directionally bored with fittings, complete. Trenching, backfilling and area restoration are included in the cost of this item.

#### **CONCRETE FOUNDATIONS**

Add the following to Article 878.03 of the "Standard Specifications":



All anchor bolts shall be according to Article 1006.09, except all anchor bolts shall be hot dipped galvanized the full length of the anchor bolt including the hook.

Concrete Foundations, Type A for Traffic Signal Posts shall provide anchor bolts with the bolt pattern specified within the "IDOT District 1 Standards Traffic Signal Design Details". All Type A foundations shall be a minimum depth of forty-eight (48) inches.

Concrete Foundations, Type C (Special) for Traffic Signal Cabinets with Uninterruptable Power Supply (UPS / Battery Back-Up) cabinet installations shall be constructed a minimum of forty-eight (48) inches long by thirty-one (31) inches wide, and shall have a minimum depth of forty-eight (48) inches. An integral concrete pad foundation for the UPS cabinet shall be constructed a minimum of thirty-one (31) inches long by twenty (20) inches wide by ten (10) inches deep. The UPS cabinet pad foundation shall be integral to the side of the signal cabinet foundation, and shall be constructed on the same side as the signal cabinet power panel. An L-Shaped concrete apron shall be constructed along the entire front of the signal cabinet foundation, the entire side of the UPS cabinet foundation, and the entire front of the UPS cabinet foundation. This concrete apron shall be a minimum of thirty-six (36) inches wide by four (4) inches deep. Anchor bolts shall be provided and spaced according to the cabinet manufacturer's specifications.

Concrete Foundations, Type D for Traffic Signal Cabinets shall be constructed a minimum of forty-eight (48) inches long by thirty-one (31) inches wide, and shall have a minimum depth of forty-eight (48) inches. The concrete apron at the signal cabinet shall be constructed a minimum of thirty-six (36) inches wide by forty-eight (48) inches long by four (4) inches deep. Anchor bolts shall be provided and spaced according to the cabinet manufacturer's specifications.

Concrete Foundations, Type E for Mast Arm and Combination Mast Arm Poles shall be 15 ft. minimum depth and in accordance with the latest edition of IDOT standard 878001.

The Resident Engineer shall approve the foundation excavation prior to placing any concrete.

### **HANDHOLES**

Add the following to Section 814 of the "Standard Specifications":

All handholes shall be cast-in-place concrete, with a minimum inside dimension of 21-1/2 inches. Frames and lid openings shall match this dimension. The minimum wall thickness for heavy-duty hand holes shall be 12 inches. The handhole cover shall be labeled "Traffic Signals" with legible raised letters.

All conduits shall enter the handhole at a minimum depth of thirty (30) inches. However, the depth of conduit from detector loops located less than five (5) feet from the handhole may be less than thirty (30) inches.

All cable hooks shall be hot-dipped galvanized in accordance with AASHTO Specification M111. Hooks shall be a minimum of 3/8-inch diameter and extend into the handhole at least 6 inches. Hooks shall be placed a minimum of 12 inches below the lid, or lower if additional space is required. All cable hooks shall be secured with a retaining nut tightened against the handhole concrete.

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

Description. This work shall consist of furnishing and installing empty coilable non-metallic conduit (CNC) for detector loop raceways.

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

Add the following to Article 810.03 of the Standard Specifications:

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

Add the following to Article 811.03 of the Standard Specifications:

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

Basis of Payment. All installations of CNC shall be included in the cost of the contract and not paid for separately.

### **DETECTOR LOOP**

Revise Section 886 of the "Standard Specifications" to read:

A minimum of seven (7) working days prior to the Contractor cutting loops, the Engineer shall mark the location of the proposed loops and contact the Traffic Engineer **(847) 377-7000** to inspect and approve the layout. When preformed detector loops are installed, the Contractor shall have them inspected and approved prior to the placement of the concrete surface, using the same notification process as above.

Loop detectors shall be installed according to the requirements of the "IDOT District 1 Standard Traffic Signal Design Details". Saw-cuts (homeruns on preformed detector loops) from the loop to the edge of pavement shall be made perpendicular to the edge of pavement in order to minimize the length of the saw cut (homerun), unless otherwise directed by the Engineer or as shown on the plans. Polyethylene unit duct shall be used for detector loop raceways to the handholes. Coilable non-metallic conduit shall meet the requirements of NEC Article 343. All coilable non-metallic conduit used for traffic signal loop detector runs shall be included in cost of the detector loop.

The detector loop cable insulation shall be labeled with the cable specifications. Each detector loop lead-in wire shall be labeled in the handhole using a Panduit 250W175C waterproof tag or approved equal. The tag will be secured to each wire with nylon ties.

The resistance to ground for new detector loops shall be a minimum of 500 megaohms under any conditions of weather or moisture. Inductance shall be more than 50 microhenries and less than 700 microhenries. Quality readings shall be more than 5. All new or replacement lead-in cables shall be connected to the loop interface panel using appropriate crimp-on, spade type connectors. Detector loop measurements shall include the saw cut and the length of the loop lead-in to the edge of pavement. The lead-in wire, including all necessary connections for proper operations, from the edge of pavement to the handhole, shall be included in the cost of the detector loop. Coilable non-metallic conduit, trench and backfill, and drilling of pavement or

handholes shall be incidental to detector loop quantities.

The location of each dive hole shall be marked on the face of the curb, the edge of pavement or the handhole, with a saw cut 1/4 inch deep by 4 inches long.

- (a) Type I: Each detector loop, which is to be installed in new asphalt pavement, must be placed in the pavement below the surface course. Each detector loop, which is to be installed in an existing asphalt or concrete pavement, shall be located to miss existing pavement cracks, if possible. Loop sealant used to seal new loops shall consist of a two-component thixotropic, chemically-cured polyurethane. The sealant will be Chemque Q-Seal 295, Perol Elastic Cement A/C Grade or an approved equal. The sealant shall be installed 1/8 inch below the pavement surface. Excess sealant, which accumulates on the surface, shall be removed immediately. Loop sealant used to reseal existing loops shall be composed of an asphalt-based compound. The sealant will be Doseal 230 or an approved equal.
- (b) Preformed. This work shall consist of furnishing and installing a rubberized heat resistant preformed traffic signal loop in accordance with the "Standard Specifications", except for the following:

Preformed detector loops shall be installed in new pavement constructed of portland cement concrete and shall be placed in the substrate. Loop lead-ins shall be protected to the satisfaction of the Engineer.

Handholes shall be placed next to the shoulder or back of curb when preformed detector loops enter the handhole.

Preformed detector loops shall be factory assembled. Homeruns and interconnects shall be pre-wired and shall be an integral part of the loop assembly. The loop configurations and homerun lengths shall be assembled for the specific application. The loop and homerun shall be constructed using 11/16-inch outside diameter (minimum), 3/8-inch inside diameter (minimum) Class A oil resistant synthetic cord-reinforced hydraulic hose with 250 psi internal pressure rating. Hose for the loop and homerun assembly shall be one continuous piece. No joints or splices shall be allowed in the hose except where necessary to connect homeruns or interconnects to the loops. This will provide maximum wire protection and loop system strength. Hose tee connections shall be heavy-duty high temperature synthetic rubber. The tee shall be of proper size to attach directly to the hose, minimizing glue joints. The tee shall have the same flexible properties as the hose to insure that the whole assembly can conform to pavement movement and shifting without cracking or breaking. The wire used shall be #16 THWN stranded copper. The number of turns in the loop shall be application specific. Homerun wire pairs shall be twisted a minimum of four turns per foot. No wire splices will be allowed in the preformed loop assembly. The loop and homeruns shall be filled and sealed with a flexible sealant to insure complete moisture blockage and further protect the wire.

To minimize the length of time that a signal operates without vehicle detection, detector loops for active traffic signal installations shall be installed in a timely manner as follows:

If in the opinion of the Engineer construction conditions are suitable for loop installation(s), the Engineer shall notify the Contractor to proceed. The detector loops shall be installed and fully

operational within fourteen (14) calendar days following notification to proceed by the Engineer. This 14-day period shall be in effect throughout the entire year, including the off season, regardless of the Contractor's working day status. Failure by the Contractor to complete the loop installation(s) within the specified timeframe shall result in liquidated damages in the amount of **\$500.00** per calendar day, per occurrence.

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

### **ELECTRIC CABLE**

Delete "or stranded, and No. 12 or" from the last sentence of Article 1076.04 (a) of the "Standard Specifications".

Add the following to the Article 1076.04(d) of the Standard Specifications:

Service cable may be single or multiple conductor cable.

The electric service cable shall have an XLP jacket. All other cable jackets shall be polyvinyl chloride, meeting the requirements of IMSA 19-1 or IMSA 20-1. The jacket color for signal cable shall be black. The jacket color for lead-in and communications cable shall be gray. All cabling between the signal cabinet and the signal heads shall be solid copper, not multi-stranded. Heat shrink splices shall be used according to the IDOT District 1 "Standard Traffic Signal Design Details".

### **GROUNDING CABLE**

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

Add to Article 817.02 of the "Standard Specifications":

Unless otherwise noted on the Plans, the system grounding cable shall be one conductor, #6 gauge copper, with an XLP jacket.

The traffic signal grounding conductor (system grounding cable) shall be bonded, using a Listed grounding connector (Burdny type KC/K2C, as applicable, or approved equal), to all new and existing traffic signal mast arm poles and traffic/pedestrian signal posts, including push button posts. The grounding conductor shall be bonded to all new and existing pull boxes, handhole frames and covers and other metallic enclosures throughout the traffic signal wiring system and noted herein and detailed on the plans. Bonding to existing handhole frames and covers shall be paid for separately.

Add the following to Article 817.05 of the "Standard Specifications":

Basis of Payment. Payment shall be at the Contract unit price, per foot, for ELECTRIC CABLE IN CONDUIT, EQUIPMENT GROUNDING CONDUCTOR, NO. 6 1C, which price includes all associated labor and material including grounding clamps, splicing, exothermic welds/other UL Listed connectors and hardware.

### **RAILROAD INTERCONNECT CABLE**

The cable shall meet the requirements of Section 873 of the "Standard Specifications", except for the following:

Add the following to Article 873.02 of the "Standard Specifications":

The cable shall be three conductor standard #14 copper cable in a clear polyester binder, shielded with #36 AWG tinned copper braid with 85% coverage, and insulated with .016 inch polyethylene (black, blue, red). The jacket shall be black 0.045 PVC or polyethylene.

Revise Article 873.06 of the "Standard Specifications" to read:

Basis of Payment. This work shall be paid for at the contract unit price per foot for ELECTRIC CABLE IN CONDUIT, RAILROAD, NO. 14 3C, which price shall be payment in full for furnishing, installing, and making all electrical connections in the traffic signal controller cabinet. Connections in the railroad controller cabinet shall be performed by railroad personnel.

**ELECTRIC CABLE IN CONDUIT, COAXIAL**

This work shall consist of furnishing and installing a Belden 1694A RG-6/U Type Digital Coaxial Cable or approved equal. The cable shall be a 75-ohm coaxial cable with 18 AWG solid bare copper conductor, tinned copper braided shield (95% min), and black polyvinyl chloride jacket. The nominal outside diameter shall be 0.274 inches. Amphenol 31-71032 (or equivalent) BNC plug connectors shall be used at both the PTZ camera and traffic signal cabinet ends of the cable. An Amphenol CLT-2 crimping tool is required for the termination. No splices shall be allowed in the cable between the PTZ camera and the traffic signal cabinet.

Basis of payment. This work will be paid for at the contract unit price per foot for ELECTRIC CABLE IN CONDUIT, COAXIAL, which price shall be payment in full for furnishing the material, making all electrical connections and installing the cable complete, measured as specified herein.

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

This work shall consist of furnishing and installing lead-in cable for light detectors installed at existing and/or proposed traffic signal installations as part of an emergency vehicle priority system. The work includes installation of the lead-in cables in existing and/or new conduit. The electric cable shall be shielded and have (3) stranded conductors colored blue, orange, and yellow with a stranded tinned copper drain wire. The cable shall meet the requirements of the manufacturer of the Emergency Vehicle Priority System Equipment.

Basis of Payment. This work will be paid for at the contract unit price per foot for EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C, which price shall be payment in full for furnishing, installing and making all electrical connections necessary for proper operations.

**ELECTRICAL CABLE IN CONDUIT, VIDEO NO 20 4 C**

This work shall consist of furnishing and installing a Belden 5402 FE Cable or approved equal. No splices shall be allowed in the cable between the PTZ camera and the traffic signal cabinet.

Basis of payment. This work will be paid for at the contract unit price per foot for ELECTRIC CABLE IN CONDUIT, VIDEO NO. 20 4 C, which price shall be payment in full for furnishing the material, making all electrical connections and installing the cable complete, measured as specified herein.

**OUTDOOR RATED NETWORK CABLE**

This work shall consist of furnishing and installing a network cable from the traffic signal cabinet to the associated field device shown on the plans.

The outdoor rated network cable shall be a black Category 5e cable, meeting the TIA/EIA 568-B.2 telecommunication standards. The cable shall be composed of 24 AWG solid bare copper conductors, twisted pairs, polyolefin insulation, inner LLPE jacket, overall shield (100% coverage), 24 AWG stranded TC drain wire, industrial grade sunlight- and oil-resistant LLPE jacket. The cable shall be capable of performing from -40 °C to 70 °C.

Each end of the cable shall be terminated with an RJ-45 connector installed according to the TIA/EIA 568B standard. The drain wire at each end shall be terminated with a ring lug and attached to a suitable ground point.

The cable shall be Belden 7937A or approved equivalent.

The work shall be performed according to the applicable portions of Section 873 of the "Standard Specifications", and details as shown on the plans.

Basis of payment. This work will be paid for at the contract unit price per foot for OUTDOOR RATED NETWORK CABLE. The unit price shall include furnishing and installing the cable, and making all connections necessary for proper operation. Furnishing and installing the RJ-45 connectors, ring terminals and grounding the OUTDOOR RATED NETWORK CABLE shall be included in the cost of this pay item.

#### **TRAFFIC-ACTUATED CONTROLLER**

Add the following to Section 857 of the "Standard Specifications":

The controller shall be the latest model available that is compatible with "Centrac" software or "Aries" software, currently in use by LCDOT, and shall be NEMA TS2 Type 1 compatible, unless specified otherwise on the plans. Controller software compatibility requirements are based upon the controller's location in the communication system, and shall be as shown on the plans. The controller shall have the latest version of NTCIP software installed, and be equipped with an Ethernet port and a removable data key to save the controller database. Only controllers supplied by approved IDOT District 1 closed-loop equipment manufacturers will be allowed. The traffic signal controller shall provide features to inhibit simultaneous display of circular yellow and yellow arrow indications.

#### **CONTROLLER CABINET AND PERIPHERAL EQUIPMENT**

Add the following to Article 1074.03 of the "Standard Specifications":

Cabinets shall be designed for NEMA TS2 Type 1 operation. All cabinets shall be pre-wired for a minimum of eight (8) phases of vehicular, four (4) phases of pedestrian, and four (4) phases of overlap operation. Individual load switches shall be provided for each vehicle, pedestrian and right turn overlap phase.

- Cabinets – Controller cabinets shall have a footprint of approximately 44 inches wide by 26 inches deep. Type IV cabinets shall be 65 inches high, and shall provide a third shelf for mounting additional equipment. Type V cabinets shall be 77 inches high. Cabinets shall be fabricated of 1/8" thick unpainted aluminum alloy 5052-H32. The surface shall be smooth, free of marks and scratches. All external hardware shall be stainless steel.

- Cabinet Doors – Provide front and rear doors of NEMA type 3R construction with cellular neoprene gasket that is rain tight. Door hinges shall be continuous 14-gauge stainless steel and shall be secured with ¼-20 stainless steel carriage bolts. Standard equipment shall include a three-point locking system that secures the door at the top, bottom and center. A corbin lock with two keys shall also be furnished. The door shall be equipped with a two-position doorstop, one at 90° and one at 120°.
- Controller Harness – Provide a TS2 Type 2 “A” harness in addition to the TS2 Type 1 harness.
- Surge Protection – Atlantic Scientific ZoneIT Model 91391 base station, Model 91375 ZoneIT pluggable module (50kA rating) with LED status indicators, or approved equivalent.
- BIU – Containment screw required.
- Switch Guards – All switches shall be guarded.
- Back Panel – The back panel wiring shall be securely covered with a piece of plexiglass, minimum thickness 1/8-inch.
- Heating – One (1) 200-watt, thermostatically-controlled, Hoffman electric heater, or approved equivalent.
- Lighting – Four (4) LED light assemblies shall be included along the top and sides of the cabinet. The LED panels shall be controlled by a wall switch. Relume Traffic Control Box LED panels and power supply, or approved equivalent.
- Plan & Wiring Diagrams – 12” x 16” moisture sealed container attached to door.
- The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1 ½ inch deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one (1) complete set of cabinet prints and manuals. This drawer shall support 50 lbs. in weight when fully extended. The drawer shall open and close smoothly. Drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 24 inches wide.
- Detector Racks – Full-size rack fully wired to support one BIU, sixteen channels of vehicle detection, and four channels of EVP.
- Field Wiring Labels – All field wiring shall be labeled.
- Field Wiring Termination – Approved channel lugs required.
- Power Supply – Provide a nonconductive shield.
- Circuit Breaker – The signal circuit breaker shall be sized for the proposed load, but shall not be rated less than thirty (30) amps.
- Police Door – Provide wiring and termination for plug-in manual phase advance switch.
- Railroad Pre-Emption Test Switch – Eaton 8830K13 SHA 1250 or approved equivalent.
- MMU – 16 Channel, LCD display, IP addressable (Ethernet) Malfunction Management Unit. The MMU shall be connected to the Ethernet switch with a CAT 5e cable, and configured for proper communication.
- Door Alarm – The front and rear doors shall be equipped with switches wired to the traffic signal controller alarm 1 input for logging and reporting of a door open condition.

**FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL**

This item shall comply with Sections 857 and 863 of the “Standard Specifications” for Road and Bridge Construction, and shall also comply with the following requirements:

The controller shall meet the requirements for NEMA-TS2 standards for a Type 1 Cabinet. The controller shall be the latest model available that is compatible with “Centracs” software or

"Aries" software, currently in use by LCDOT. Controller software compatibility requirements are based upon the controller's location in the communication system, and shall be as shown on the plans. The controller shall have the latest version of NTCIP software installed, and be equipped with an Ethernet port and a removable data key to save the controller database.

The cabinet shall be NEMA TS2 Type 1 design, meeting the requirements of CONTROLLER CABINET AND PERIPHERAL EQUIPMENT.

Basis of payment. This item will be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL which price shall be payment in full for furnishing and installing the cabinet and controller, complete with necessary connections and equipment for proper operation, at a location designated by the Engineer.

**TRAFFIC ACTUATED CONTROLLER & CABINET INTERCONNECTED WITH RAILROADS**

Add the following to Articles 1073.01 (c) (2) and 1074.03 (a) (5) (e) of the Standard Specifications:

Controllers and cabinets shall be new and NEMA TS2 Type 1 design.

A method of monitoring and/or providing redundancy to the railroad preemptor input to the controller shall be included as a component of the Railroad, Full Actuated Controller and Cabinet installation and be verified by the traffic signal equipment supplier prior to installation. The cabinet shall be NEMA TS2 Type 1 design, meeting the requirements of CONTROLLER CABINET AND PERIPHERAL EQUIPMENT and FULL ACTUATED CONTROLLER, IN TYPE IV CABINET, (SPECIAL).

Railroad interconnected controllers and cabinets shall be assembled only by an approved traffic signal equipment supplier. All railroad interconnected (including temporary railroad interconnect) controllers and cabinets shall be new, built, tested and approved by the controller equipment vendor, in the vendor's IDOT District 1 facility, prior to field installation. The vendor shall provide the technical equipment and assistance as required by the Engineer to fully test this equipment.

**MASTER CONTROLLER**

Revise Articles 860.02 and 860.03 of the "Standard Specifications" to read:

The Master Controller shall be the latest model available that is compatible with "Aries" software, currently in use by LCDOT. The minimum baud rate for fiber optic interconnected signal systems shall be 9600 bps.

This item shall also include the installation of an outdoor network interface for termination of the telephone service and a US Robotics 56k modem. The outdoor network interface shall be mounted to the inside of the cabinet in a location suitable to provide access for termination of the telephone service. The outdoor network interface shall be equipped with a standard Three-Electrode Heavy Duty Gas Tube Surge Arrestor.

**INTERSECTION MONITOR**

This item shall consist of furnishing and installing an Intersection Monitor at a new or existing traffic signal controller. This item is necessary at isolated (non-interconnected) traffic signals in order to monitor the intersection and controller operations. The Intersection Monitor shall be either an internal module installed in the controller, or an external data key, and shall be the



latest model available. The Intersection Monitor shall be fully compatible with "Aries" traffic signal management software, currently in use by LCDOT.

This item shall also include the installation of an outdoor network interface for termination of the telephone service and a US Robotics 56k modem. The outdoor network interface shall be mounted to the inside of the cabinet in a location suitable to provide access for termination of the telephone service. The outdoor network interface shall be equipped with a standard Three-Electrode Heavy Duty Gas Tube Surge Arrestor.

Basis of payment. This item will be paid for at the contract unit price each for INTERSECTION MONITOR, which price shall be payment in full for furnishing and installing the Intersection Monitor (module or data key) complete with all necessary connections and equipment for proper operations.

### **INDUCTIVE LOOP DETECTOR.**

Add the following to Article 1079.01 of the Standard Specifications:

Contracts requiring new cabinets shall provide for rack mounted detector amplifier cards. Detector amplifiers shall provide LCD displays with loop frequency, inductance, and change of inductance readings.

### **UNINTERRUPTABLE POWER SUPPLY, SPECIAL**

This specification sets forth the minimum requirements for an uninterruptable power system (UPS) with battery back-up, for a traffic signal. The system is comprised of the UPS or Inverter unit, bypass switch, batteries, cabinet, and related wiring harnesses.

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

The UPS shall be line interactive or double conversion and provide voltage regulation and power conditioning when utilizing utility power.

The UPS shall be sized appropriately for the intersection's normal traffic signal operating connected load, plus 20 percent (20%). The total connected traffic signal load shall not exceed the published ratings for the UPS. The UPS shall provide a minimum of six (6) hours of normal operation run-time for signalized intersections with LED type signal head optics at 77 °F (25 °C) (minimum 700 W/1000VA active output capacity, with 90 percent minimum inverter efficiency).

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

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

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

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

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

Batteries, inverter/charger and power transfer relay shall be housed in a separate NEMA Type

3R cabinet. The cabinet shall be Aluminum alloy, 5052-H32, 0.125-inch thick and have a natural mill finish.

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

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

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

The door shall be equipped with a two-position doorstop, one at 90° and one at 120°.

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

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

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

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

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

- (8) The UPS shall include a tip or kill switch installed in the battery cabinet, which shall completely disconnect power from the UPS when the switch is manually activated.
- (9) The UPS shall incorporate a flanged electric generator inlet for charging the batteries and operating the UPS. The generator connector provided shall be a NEMA L5-15P or NEMA L5-30P locking plug. The connector shall be rated for a minimum of 15/125VAC.
- (10) A power adapter cord shall be provided which converts the supplied NEMA locking connector to a NEMA 5-15P plug. The power adapter cord shall be rated for a minimum of 15A/125VAC and shall be a minimum of 12 inches in length.
- (11) Access to the generator inlet shall be from a secured weatherproof lift cover plate or behind a locked battery cabinet police panel.

#### Battery System.

Revise Article 1074.04(d) (3) of the Standard Specifications to read:

All batteries supplied in the UPS shall be either gel cell or AGM type, deep cycle, completely sealed, prismatic lead calcium based, silver alloy, valve regulated lead acid (VRLA) requiring no maintenance. All batteries in a UPS installation shall be the same type; mixing of gel cell and AGM types within a UPS installation is not permitted.

Revise Article 1074.04(d) (4) of the Standard Specifications to read:

Batteries shall be certified by the manufacturer to operate over a temperature range of -13 to 160 °F (-25 to + 71 °C) for gel cell batteries and -40 to 140 °F (-40 to + 60 °C) for AGM type

batteries.

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

- (9) The UPS shall consist of an even number of batteries that are capable of maintaining normal operation of the signalized intersection for a minimum of six hours. Calculations shall be provided showing the number of batteries of the type supplied that are needed to satisfy this requirement. A minimum of four batteries shall be provided.

Add the following to the Article 1074.04 of the Standard Specifications:

- (e) Warranty. The warranty for an uninterruptable power supply (UPS) shall cover a minimum of two years from date the equipment is placed in operation; however, the batteries of the UPS shall be warranted for full replacement for a minimum of five years from the date the traffic signal and UPS are placed into service.

Basis of payment. This item shall be paid for at the contract unit price, each, for furnishing and installing the UNINTERRUPTABLE POWER SUPPLY, SPECIAL. The price shall include the UPS/Inverter unit, Bypass Switch, Batteries, Cabinet, wiring harnesses, power adapter cord, and all associated equipment and materials necessary for proper operation.

#### **EMERGENCY VEHICLE PRIORITY SYSTEM**

Revise Section 887 of the "Standard Specifications" to read:

If not marked in the Contract plans, it shall be the Contractor's responsibility to contact the municipality or fire district to verify the brand of emergency vehicle preemption equipment to be installed prior to the contract bidding. The equipment must be of the latest type manufactured and must be completely compatible with all components of signal equipment currently in use by the County.

All new installations shall be equipped with confirmation beacons as shown on the IDOT District 1 "Standard Traffic Signal Design Details". The confirmation beacon shall consist of a PAR 38 white LED flood lamp (90 watt equivalent, approved by the Engineer) for each direction of traffic. The lamp shall have an adjustable mount with a weatherproof enclosure for cable splicing. All hardware shall be cast aluminum or stainless steel. Holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires. In order to maintain uniformity between communities, the confirmation beacons shall indicate when the control equipment receives the preemption signal. The preemption movement shall be signaled by a flashing indication at the rate specified by Section 4L.01 of "MUTCD". The stopped preempted movements shall be signaled by a continuous indication.

All light operated systems shall operate at a uniform rate of 14.035 hz  $\pm$  0.002 hz, or as otherwise required by the Traffic Engineer, and provide compatible operation with other light systems currently being operated in the County.

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

Basis of Payment. The work shall be paid for at the contract unit price each for furnishing and installing LIGHT DETECTOR and LIGHT DETECTOR AMPLIFIER. Furnishing and installing the confirmation beacon shall be included in the cost of the Light Detector. Any required

modifications to the traffic signal controller shall be included in the cost of the LIGHT DETECTOR AMPLIFIER. The light detector amplifier shall be paid for on a basis of (1) one each per intersection controller and shall provide operation for all movements required in the pre-emption phase sequence.

**STEEL MAST ARM ASSEMBLY AND POLE**

**STEEL COMBINATION MAST ARM ASSEMBLY AND POLE**

Add the following to Article 1077.03 of the "Standard Specifications":

Traffic signal mast arms shall be one-piece construction, unless otherwise approved by the Engineer. All mast arms, mast arm poles, luminaire arms, cast iron bases, and any exposed steel hardware shall be hot-dipped galvanized.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

Luminaire arms shall be steel, and of the length shown on the plans. Luminaire arms over fifteen (15) feet in length shall be tapered, monotube style, with AASHTO 2001 wrap-around, gusset style connection.

Luminaires shall be "cobra head" style, with a minimum mounting height of forty-five (45) feet, and shall be paid for separately.

Stainless steel mesh screening shall be stainless steel banded to the anchor bolts, with a minimum 2-inch lap, to enclose the void between the top of the foundation and the base plate. The mesh screening shall have ¼-inch maximum opening and a minimum wire diameter of AWG NO. 16.

The base of the mast arm pole shall be protected by a bolt-on galvanized metal shroud or an approved equal. The shroud shall be of sufficient strength to deter pedestrian and vehicular damage. The shroud shall be constructed and designed to allow air to circulate throughout the mast arm but not allow infestation of insects or other animals, and such that it is not hazardous to probing fingers and feet. All mounting hardware shall be stainless steel.

**STEEL MAST ARM ASSEMBLY AND POLE (SPECIAL)**

**STEEL COMBINATION MAST ARM ASSEMBLY AND POLE (SPECIAL)**

Add the following to Article 1077.03 of the "Standard Specifications":

Base covers for mast arm poles shall be cast aluminum. All mast arms, mast arm poles, luminaire arms, and any exposed steel hardware shall be hot-dipped galvanized, and then powder-coated black by the supplier/manufacturer, as described below or an approved alternative finishing method. Cast aluminum base covers shall be powder-coated black by the supplier/manufacturer, as described below or an approved alternative finishing method.

All galvanized and aluminum exterior surfaces shall be coated with chip resistive epoxy resin primer applied via electrostatic spray equipment. The primer is to be applied at a minimum dry film thickness (DFT) of 3.0 mils with a minimum DFT of 6.0 mils applied to the lower 8 feet of the pole. The primer coat must be energy absorptive, and capable of achieving a rating of 10A under testing per ASTM (American Society for Testing and Materials) Procedure D3170, Standard Test Method for Chipping Resistance of Coatings. The primed surfaces shall then be coated with a black semi-gloss TGIC Super Durable Polyester topcoat to a minimum dry film

thickness of 3.0 mils. The topcoat must meet the requirements of AAMA (American Architectural Manufacturer's Association) 2604 for color and gloss retention properties.

The manufacturer shall warranty the finish of all components for a period of at least 5 years from the date of shipment. The contractor shall provide a copy of the warranty to the Engineer, upon request.

All chips, scrapes, scratches, etc. in the paint shall be touched-up by the Contractor according to the manufacturer's recommendations, with matching paint supplied by the manufacturer.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

Stainless steel mesh screening shall be stainless steel banded to the anchor bolts, with a minimum 2-inch lap, to enclose the void between the top of the foundation and the base plate. The mesh screening shall have ¼-inch maximum opening and a minimum wire diameter of AWG NO. 16.

All base covers shall fit tightly around the poles, with little or no gap at the top of the base cover. Two-piece base covers shall fit together tightly, with little or no gap between the two pieces. All base covers shall fit securely on top of the foundation, and shall not easily move or wobble. All base covers shall have an access hand hole, with a removable cover, and a minimum opening size of 200 square inches.

Pedestrian pushbutton stations shall be mounted to mast arm base covers according to the following: The top and bottom of the station shall be secured by drilling, tapping, and installing a 3/8-inch stainless steel threaded bolt, lock washer, and hex nut. Do not use self-tapping screws. Spacers made of 3/4-inch aluminum conduit shall be installed behind the pushbutton station, to level and plumb the station.

Luminaire arms shall be steel, and of the length shown on the plans. Luminaire arms over fifteen (15) feet in length shall be tapered, monotube style, with AASHTO 2001 wrap-around, gusset style connection.

Luminaires shall be installed at a minimum mounting height of forty-five (45) feet, and shall be paid for separately.

All (Special) steel mast arm assemblies and poles (including combination mast arm assemblies) shall be manufactured and/or supplied by Sternberg Vintage Lighting, Union Metal, Valmont, or approved equal, according to the following:

- Round, tapered, 16-sharp fluted pole.
- Round, tapered, smooth, standard-curved, flange-connected, traffic signal mast arm

The two-piece mast arm base cover shall be cast aluminum, and shall be manufactured and/or supplied by the same company as the mast arm assembly and pole. Manufacturer designations for the two-piece mast arm base cover to be used with (SPECIAL) MAST ARM ASSEMBLIES include the following:

- Hamilton 6401SS (Sternberg)
- Lake County AC1 base cover (Valmont)

**LUMINAIRE**

Add the following to Article 1067.01(e) of the "Standard Specifications":

The luminaire housing shall be cobra head style.

Revise Article 1067.01(i) of the "Standard Specifications" to read:

The luminaire shall be painted black or powder-coated black to match the finish of STEEL COMBINATION MAST ARM ASSEMBLY AND POLE (SPECIAL).

**TRAFFIC SIGNAL POST**

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

Steel posts and cast iron bases shall be hot-dipped galvanized.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

**TRAFFIC SIGNAL POST (SPECIAL)**

Add the following to Article 1077.01 of the "Standard Specifications":

All Traffic Signal Posts (Special) shall be sixteen (16) feet in height, extruded aluminum, unless otherwise specified on the plans. All bases for Traffic Signal Post (Special) shall be cast aluminum.

All Traffic Signal Posts (Special) and associated bases shall be assembled and powder-coated black at the factory. The powder-coated finish and warranty shall meet the requirements of STEEL MAST ARM ASSEMBLY AND POLE (SPECIAL). All exposed steel hardware shall be hot-dipped galvanized, and then powder-coated black.

All chips, scrapes, scratches, etc. in the paint shall be touched-up by the Contractor according to the manufacturer's recommendations, with matching paint supplied by the manufacturer.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

Pedestrian pushbutton stations shall be mounted to signal posts according to the following: The top and bottom of the station shall be secured by drilling, tapping, and installing a 3/8-inch stainless steel threaded bolt. Self-tapping screws are not allowed. Anti-seize lubricating compound shall be applied to all pushbutton and pushbutton station hardware. Spacers made of 3/4-inch aluminum conduit shall be installed behind the pushbutton station, to level and plumb the station.

All Traffic Signal Posts (Special) and associated bases shall be manufactured and/or supplied by Beacon, Stemberg Vintage Lighting, Union Metal, Valmont, or approved equal, according to the following:

- Round, straight (non-tapered), five (5)-inch diameter, 12-flat fluted post.
- A ball center cap for the top of the post, instead of a tenon.
- The base section of the post shall be approximately forty-three (43) inches tall.

Manufacturer designations for TRAFFIC SIGNAL POST (SPECIAL) include the following:

- MainStreet Series (100SJ) base (Beacon)
- Hamilton Series (5400D) base (Sternberg)

### **PEDESTRIAN PUSH-BUTTON**

Replace Article 1074.02 of the "Standard Specifications" with the following:

Pedestrian Push-button assembly shall be ADA compliant, 3-inch round style, highly vandal resistant, non-moving, pressure activated, with a solid-state Piezo switch actuator that cannot be stuck in an "on" or constant call position. A latching red LED and audible tone shall be provided to confirm an actuation. The housing, or bezel, of the assembly shall be solid aluminum and powder coated yellow. The button shall be stainless steel or nickel-plated aluminum.

Pedestrian Push-button assembly shall be a Campbell Company 4 EVR CL with Enlightened Interface Module (ENIM), a Polara Bulldog BDL3-Y with Latching Push Button Control Unit (LPBCU), or approved equivalent.

The pedestrian station shall be a Campbell Company 912H Station, Polara PBF9X12 or approved equivalent.

The station shall be installed with a 9-inch by 12-inch retro-reflective sign, according to the following: Where pedestrian signal heads are used, pedestrian signs shall provide the "Push Button for" legend, with the Walking Man symbol and arrow (R10-3). Where no pedestrian signal heads are used, pedestrian signs shall provide the "Push Button for Green Light" legend with arrow (R10-4 with arrow), or as specified on the plans.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

Anti-seize lubricating compound shall be applied to all pushbutton and pushbutton station hardware.

Refer to STEEL MAST ARM ASSEMBLY AND POLE (SPECIAL), STEEL COMBINATION MAST ARM ASSEMBLY AND POLE (SPECIAL), and/or TRAFFIC SIGNAL POST (SPECIAL) for additional installation requirements.

### **ILLUMINATED SIGN, LIGHT EMITTING DIODE**

Delete last sentence of Article 1084.01(a) and add "Mounting hardware shall be black polycarbonate or galvanized steel and similar to mounting Signal Head hardware and bracket specified herein and shall provide tool free access to the interior."

Revise the second paragraph of Article 1084.01(a) of the Standard Specifications to read:

The exterior surface of the housing shall be acid-etched and shop painted with one coat of zinc-chromate primer and two coats of exterior enamel. The housing shall be the same color (yellow or black) to match the existing or proposed signal heads. The painting shall be according to Section 851.

Add the following to Article 1084.01 (b) of the Standard Specifications:

The message shall be formed by rows of LEDs. The sign face shall be 24 inches by 24 inches .

Add the following to Article 1084.01 of the Standard Specifications:

- (e) The light emitting diode (LED) blank out signs shall be manufactured by National Sign & Signal Company, or an approved equal and consist of a weatherproof housing and door, LEDs and transformers.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

Basis of payment. This work shall be paid for at the unit price each for ILLUMINATED SIGN, LIGHT EMITTING DIODE.

### **LED INTERNALLY ILLUMINATED STREET NAME SIGN**

This work shall consist of furnishing a street name sign which is internally illuminated with light emitting diodes, and installing the sign on a traffic signal mast arm or span wire.

#### (a) Description.

The LEDs shall be white in color and utilize InGaN or UV thermally efficient technology. The LED Light Engines shall be designed to fit inside a standard fluorescent illuminated street sign housing in lieu of fluorescent lamps and ballasts. The LED internally-illuminated street name sign shall display the designated street name clearly and legibly in the daylight hours without being energized and at night when energized. The sign assembly shall consist of a four-, six-, or eight-foot aluminum housing. White translucent 3M DG<sup>3</sup> reflective sheeting sign faces with the street name applied in 3M/Scotchlite Series 1177 or current 3M equivalent transparent green shall be installed in hinged doors on the side of the sign for easy access to perform general cleaning and maintenance operations. Illumination shall occur with LED Light Engine as specified.

#### (b) Environmental Requirements.

The LED lamp shall be rated for use in the ambient operating temperature range of -40 to +50°C (-40 to +122°F) for storage in the ambient temperature range of -40 to +75°C (-40 to +167°F).

#### (c) General Construction.

1. The LED Light Engine shall be a single, self-contained device, for installation in an existing street sign housing. The power supply must be designed to fit and mounted on the inside wall at one end of the street sign housing. The LED Light Engine shall be mounted within the inner top portion of the housing and no components of the light source shall sit between the sign faces.
2. The assembly and manufacturing processes of the LED Light Engine shall be designed to ensure that all LED and electronic components are adequately supported to withstand mechanical shocks and vibrations in compliance with the specifications of the ANSI, C136.31-2001 standards.

#### (d) Mechanical Construction.

1. The sign shall be constructed using a weatherproof, aluminum housing consisting of an extruded aluminum top with a minimum thickness of .140" x 10 3/4" deep (including the drip edge). The extruded aluminum bottom is .094" thick x 5 7/8" deep. The ends of the housing shall be cast aluminum with a minimum thickness of .250". A six-foot sign shall



be 72 5/8" long and 22 5/16" tall and not weigh more than 77 pounds. An eight-foot sign shall be 96 5/8" long and 22 5/16" tall and not weigh more than 92 pounds. All corners are continuous TIG (Tungsten Inert Gas) welded to provide a weatherproof seal around the entire housing.

2. The door shall be constructed of extruded aluminum. Two corners are continuous TIG welded with the other two screwed together to make one side of the door removable for installation of the sign face. The door is fastened to the housing on the bottom by a full length, .040" x 1 1/8" open stainless steel hinge. The door shall be held secure onto a 1" wide by 5/32" thick neoprene gasket by three (six total for two-way sign) quarter-turn fasteners to form a watertight seal between the door and the housing.
  3. The sign face shall be constructed of .125" white translucent polycarbonate. The letters shall be 8" upper case and 6" lower case. The sign face legend background shall consist of 3M/Scotchlite Series 4090T or current equivalent 3M translucent DG<sup>3</sup> white VIP (Visual Impact Performance) diamond grade sheeting (ATSM Type 9) and 3M/Scotchlite Series 1177 or current 3M equivalent transparent green acrylic EC (electronic cut-able) film applied to the front of the sign face. The legend shall be framed by a white polycarbonate border. A logo symbol and/or name of the community may be included with approval of the Engineer.
  4. All surfaces of the sign shall be etched and primed in accordance to industry standards before receiving appropriate color coats of industrial enamel. The sign frame shall be painted black with a durable powder coated process.
  5. All fasteners and hardware shall be corrosion resistant stainless steel. No tools are required for routine maintenance.
  6. All wiring shall be secured by insulated wire compression nuts.
  7. A wire entrance junction box shall be supplied with the sign assembly. The box may be supplied mounted to the exterior or interior of the sign and provide a weather tight seal.
  8. Each sign shall be activated by a photocell mounted/installed on the side of the sign frame.
  9. Brackets and Mounting: LED internally-illuminated street name signs will be factory drilled to accommodate mast arm two-point support assembly mounting brackets.
- (e) Electrical.
1. Photocell shall be rated 105-305V, turn on at 1.5 fcs. with a 3-5 second delay. A manufacturer's warranty of six (6) years shall be provided. Power consumption shall be no greater than 1 watt at 120V.
  2. The LED Light Engine shall operate from a 60 +/- 3 cycle AC line power over a voltage range of 80 to 135 Vac rms. Fluctuations in line voltage over the range of 80 to 135 Vac shall not affect luminous intensity by more than +/- 10%.
  3. Total harmonic distortion induced into the AC power line by the LED Light Engine, operated at a nominal operating voltage, and at a temperature of +25°C (+77°F), shall not exceed 20%.

4. The LED Light Engine shall be cycled ON and OFF with a photocell as shown on the detail sheet and shall not exceed the following maximum power values:

4-Foot Sign	60 W
6-Foot Sign	90 W
8-Foot Sign	120 W

The signs shall not be energized when traffic signals are powered by an alternate energy source such as a generator or uninterruptible power source (UPS). The signs shall be connected to the generator or UPS bypass circuitry.

(f) Photometric Requirements.

1. The entire surface of the sign panel shall be evenly illuminated. The average maintained luminous intensity measured across the letters, operating under the conditions defined in Environmental Requirements and Wattage Sections shall be of a minimum value of 100 cd/m<sup>2</sup>.
2. The manufacturer shall make available independent laboratory test results to verify compliance to Voltage Range and Luminous Intensity Distribution Sections.
3. Twelve (12) 1.25 watt LED units shall be mounted on 1-inch x 22-inch metal core printed circuit boards (MCPCB). The viewing angle shall be 120 degrees. LED shall have a color temperature of 5200k nominal, CRI of 80 with a life expectancy of 75,000 hrs.

(g) Quality Assurance.

The LED Light Engine shall be manufactured in accordance with a vendor quality assurance (QA) program. The production QA shall include statistically controlled routine tests to ensure minimum performance levels of the LED Light Engine build to meet this specification. QA process and test result documentations shall be kept on file for a minimum period of seven (7) years. The LED Light Engine that does not satisfy the production QA testing performance requirements shall not be labeled, advertised, or sold as conforming to these specifications. Each LED Light Engine shall be identified by a manufacturer's serial number for warranty purposes. LED Light Engines shall be replaced or repaired if they fail to function as intended due to workmanship or material defects within the first sixty (60) months from the date of acceptance. LED Light Engines that exhibit luminous intensities less than the minimum value specified in Photometric Section within the first thirty-six (36) months from the date of acceptance shall be replaced or repaired.

The sign shall be mounted on the mast arm three feet to the right of the furthest right signal head, as viewed by the approaching traffic.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The Manufacturer/Vendor shall supply shop drawings of the fixtures, sign, sign message and mounting hardware for approval. All hardware used to install the sign shall be in accordance with the manufacturer's recommendations.

Basis of Payment. This work will be paid for at the contract unit price each for furnishing and installing LED INTERNALLY ILLUMINATED STREET NAME SIGN, of the size specified,

complete in place, including photocell and all related hardware, wiring, and connections required for proper operations. The #14 2/C cable from the signal cabinet to the sign shall be paid for separately.

### **MAST ARM SIGN PANELS**

Add the following to Article 720.02 of the Standard Specifications:

Signs attached to poles or posts (such as mast arm signs) shall have mounting brackets and sign channels which are equal to and completely interchangeable with those used by LCDOT. All aluminum signs shall have a white reflectorized legend and border on a green reflectorized background, DG<sup>3</sup> type sheeting. The sign face shall not have any holes. 3M Scotch Joining Systems bonding tape or an approved equal shall be used in place of screws or rivets. The Signfix Aluminum Channel Framing System is currently recommended, but other brands of mounting hardware or bonding tape may be acceptable based upon LCDOT approval.

### **SIGNAL HEADS**

Add the following to Section 1078 of the Standard Specifications to read:

All vehicle signal and pedestrian signal heads shall provide 12-inch displays, with glossy black polycarbonate housings, with the following exception: At locations where existing yellow polycarbonate heads will remain, all new signal heads shall be yellow to match the existing ones. Connecting hardware and mounting brackets shall be polycarbonate, the same color as the heads, or galvanized. A corrosive resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints, and shall be visible to the inspector at the signal turn-on. Where required, incandescent bulbs shall be manufactured by Duratest, Sylvania or an approved equal.

### **SIGNAL HEAD, LED**

This work shall consist of furnishing and installing a traffic signal head with light emitting diodes (LED) of the type specified in the plans, in accordance with Sections 880 and 1078 of the Standard Specifications for Road and Bridge Construction, and the following.

The lens of the LED signal module shall be tinted with a wavelength-matched color to reduce sun phantom effect and enhance on/off contrast. The tinting shall be uniform across the lens face, and shall not affect chromaticity. The lens shall be smooth, with the same uniform appearance as incandescent lenses.

Each individual LED signal module shall be clearly marked with the manufacturer's name, model number, date of manufacture, nominal operating voltage, and power consumption in watts.

The LED signal module shall have a one-piece neoprene gasket.

The LEDs arrow indication shall be a solid display with a minimum of three (3) outlining rows of LEDs and at least one (1) fill row of LEDs.

All LED signal modules shall be warranted for 5 years from the date of traffic signal turn-on against failures due to manufacturing, workmanship, or material defects including modules which exhibit luminous intensities less than the minimum values specified by the Institute for Transportation Engineers (ITE) LED purchase specification, "Vehicle Traffic Control Signal Heads: LED Circular Signal Supplement". Any modules that do not meet these warranty requirements shall be replaced or repaired at no expense to the County. The manufacturer's

written warranty for the LED signal modules shall be included in the product submittal to the County.

**PEDESTRIAN SIGNAL HEAD, LED**

**PEDESTRIAN SIGNAL HEAD, LED, COUNTDOWN**

This work shall consist of furnishing and installing a pedestrian countdown signal head, with light emitting diodes (LED) of the type specified in the plans, in accordance with Section 881 and Article 1078.02 of the Standard Specifications for Road and Bridge Construction, and the following.

Pedestrian Countdown Signal Heads shall not be used at signalized intersections where traffic signals and railroad warning devices are interconnected.

The nominal message-bearing surface of pedestrian signal heads shall be 12 in. x 12 in.

Pedestrian Countdown Signal Heads shall consist of two (2) 12-inch by 12-inch modules aligned vertically. The top module of the unit shall be overlapping full "HAND" and full "MAN" symbols. The bottom module of the unit shall be a two digit numerical countdown display ("00" to "99"). The counter shall begin countdown at the beginning of the pedestrian clearance interval as the pictogram of the hand starts flashing. The counter shall execute a countdown of the time, in seconds, of the pedestrian clearance interval synchronized with the controller and ending at (0) at the expiration of the pedestrian clearance interval. The counter shall be blank at all other times.

The visor for each signal shall be the tunnel visor.

The signal module shall have a one-piece neoprene gasket.

The signal module identification labels and warranty shall be according to the SIGNAL HEAD, LED section of these specifications.

**SIGNAL HEAD, LED, RETROFIT**

This work shall consist of furnishing and installing vehicle or pedestrian LED signal modules in an existing signal head, of the type and mounting specified in the plans, according to the following.

All vehicle and pedestrian LED Retrofit signal modules shall fully comply with the SIGNAL HEAD, LED; PEDESTRIAN SIGNAL HEAD, LED; and PEDESTRIAN SIGNAL HEAD, LED, COUNTDOWN sections of these specifications.

Basis of Payment. This item shall be paid for at the contract unit price each for SIGNAL HEAD, LED, of the type and mounting specified, RETROFIT or PEDESTRIAN SIGNAL HEAD, LED, RETROFIT; or PEDESTRIAN SIGNAL HEAD, LED, COUNTDOWN, RETROFIT, which price shall be payment in full for furnishing the equipment described above including LED(s) modules, all mounting hardware, and installing them in satisfactory operating condition.

**TRAFFIC SIGNAL BACKPLATE**

Delete the second sentence of the fourth paragraph of Article 1078.03 of the Standard Specifications.

Add the following to the fourth paragraph of Article 1078.03 of the Standard Specifications:

When retro reflective sheeting is specified, it shall be Type ZZ sheeting according to Article 1091.03 and applied in preferred orientation for the maximum angularity according to the manufacturer's recommendations. The retro reflective sheeting shall be installed under a controlled environment at the manufacturer/supplier before shipment to the contractor. The aluminum backplate shall be prepared and cleaned, following recommendations of the retro reflective sheeting manufacturer.

**VIDEO DETECTION SYSTEM, (COMPLETE INTERSECTION)**

This specification sets forth the minimum requirements for a system that monitors vehicles on a roadway via processing of video images and provides detector outputs to a traffic signal controller. This work shall consist of furnishing and installing video cameras, all cables, video processors, controller interface unit, and remote communication module to operate a video vehicle detection system at one signalized intersection.

The video detection system, (complete intersection) shall be one of the following or approved equal:

- Autoscope Encore, Terra TIP, Terra TAP
- Iteris RZ-4 WDR, Vantage Edge 2, Vantage TS2-IM, Edge Connect
- Autoscope AIS-IV, Terra RackVision,

All the cables from the detection cameras to the traffic signal cabinet and within the traffic signal cabinet itself shall be included in the cost of this item.

The video detection system, (complete intersection) shall also include a LCD monitor in the traffic signal cabinet with BNC connector for video input.

The video detection camera shall be installed on top of the luminaire arm. However, occasionally overhead utility wires obstruct the camera's field of view and prevent proper detector placement. When this occurs, the camera shall be installed on a J-hook below the luminaire arm, instead of the normal mounting bracket. The cost of the J-hook shall be included in the cost of this item.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

Surge protection and grounding shall be provided to protect the video detection cameras and components located in the traffic signal cabinet.

In order for the Traffic Engineer to manipulate detection zones and view the video signal over a high-speed connection, the VIDEO DETECTION SYSTEM, (COMPLETE INTERSECTION) must be connected to either the LCDOT Gigabit Ethernet network or a VIDEO TRANSMISSION SYSTEM.

If the VIDEO DETECTION SYSTEM, (COMPLETE INTERSECTION) is being connected to the Gigabit Ethernet network, the remote communications module shall communicate over 10/100 Base T Ethernet to a LAYER II (DATA LINK) SWITCH and/or a LAYER III (NETWORK) SWITCH. The Layer II and Layer III switches shall be installed according to the plans, and shall be paid for separately.

Basis of Payment. This item will be paid for at the contract unit price each for VIDEO DETECTION SYSTEM, (COMPLETE INTERSECTION) which price shall be payment in full for furnishing all associated equipment, cables and hardware required, installing the system at one signalized intersection, and placing the system in operation to the satisfaction of the Engineer.

**REMOTE-CONTROLLED VIDEO SYSTEM**

This pay item shall include providing and installing a remote-controlled video system at a location designated by the Engineer. The remote-controlled video system shall be a PELCO Spectra IV SE Series Discreet Dome System or approved equal. This pay item shall include a color camera (minimum 35x optical zoom), dome assembly, all mounting hardware, connectors, cables, and related equipment necessary to complete the installation in accordance with the manufacturer's specifications.

The PTZ control, power, and coax cables from the traffic signal cabinet shall be paid for separately.

The camera shall be installed as shown on the plans, either on the luminaire arm near the luminaire, or on the combination mast arm assembly pole, angled toward the center of the intersection. When installed on the pole, the camera shall be mounted with a 14-inch pendant arm with integral transformer / power supply (Pelco IWM24-GY or approved equal). When installed on the luminaire arm, the camera shall be installed with a 30-degree tilt-adjustable bracket, and the external power supply (Pelco WCS1-4 or approved equal) shall be installed on the pole. Cameras and external power supplies shall be installed with stainless steel straps.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The contractor shall contact the Traffic Engineer prior to installing the Pelco camera and associated wiring, to receive final approval on the camera location.

In order for the Traffic Engineer to control the camera remotely and view the video signal over a high-speed connection, the REMOTE-CONTROLLED VIDEO SYSTEM must be connected to either the LCDOT Gigabit Ethernet network or a VIDEO TRANSMISSION SYSTEM.

If the REMOTE-CONTROLLED VIDEO SYSTEM is being connected to the Gigabit Ethernet network, then a LAYER II (DATA LINK) SWITCH and/or a LAYER III (NETWORK) SWITCH will be required. Layer II and Layer III switches shall be installed according to the plans, and shall be paid for separately.

If the REMOTE-CONTROLLED VIDEO SYSTEM is being connected to a new or existing VIDEO TRANSMISSION SYSTEM, then fiber-optic video/data transmitters and receivers may be required. Fiber-optic video/data transmitters and receivers are necessary whenever the REMOTE-CONTROLLED VIDEO SYSTEM and the VIDEO TRANSMISSION SYSTEM are installed at separate signalized intersections. When required, fiber-optic video/data transmitters and receivers shall be installed according to the plans, and shall be included in the cost of this item. The VIDEO TRANSMISSION SYSTEM shall be paid for separately.

Basis of Payment. This item will be paid for at the contract unit price each for REMOTE-CONTROLLED VIDEO SYSTEM, which price shall be payment in full for furnishing all associated equipment required, installing the system complete and in place, and placing the system in operation to the satisfaction of the Engineer.

### **CAMERA MOUNTING ASSEMBLY**

This work shall consist of modifying an existing traffic signal mast arm pole to accommodate an extension pole suitable for mounting a CCTV Camera. The pole extension shall be a 20-foot long, 4-inch diameter, Schedule 80 galvanized steel pipe and fastened to the existing mast arm pole with adjustable, galvanized steel clamps as indicated in the plans. The galvanized clamps shall fit securely around the tapered mast arm and shall be modified as required to maintain a true vertical alignment of the camera mounting assembly pole. The exposed wires shall be trained into a drip loop and protected with black plastic spiral cable wrap.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

Basis of payment. This work shall be paid for at the contract unit price each for CAMERA MOUNTING ASSEMBLY, which shall include all necessary mounting hardware, labor, and incidentals necessary to securely fasten the assembly to an existing pole and placing the camera in operation to the satisfaction of the Engineer. The camera, cables, connectors, and related equipment shall be paid for separately as part of REMOTE-CONTROLLED VIDEO SYSTEM.

### **VIDEO TRANSMISSION SYSTEM**

This specification sets forth the minimum requirements for a video transmission system that allows a user to transmit video output from multiple cameras to a remote location, via video transmitter(s) and a high-speed communication link.

The high-speed communication link will be either an ISDN phone line or DSL connection as indicated on the plans.

The VIDEO TRANSMISSION SYSTEM may be installed in either the intersection traffic signal cabinet or in the VIDEO COMMUNICATIONS CABINET. The Cabinet shall be paid for separately.

The VIDEO TRANSMISSION SYSTEM may include the relocation of existing video transmitter(s), ISDN modems, Cisco router, and/or high-speed Internet modem(s) to a new traffic signal cabinet. The relocation of such existing equipment to a new traffic signal cabinet shall be performed as directed by the Engineer and included in the cost of the VIDEO TRANSMISSION SYSTEM. Any item damaged during removal, storage, or reinstallation shall be repaired or replaced in kind to the satisfaction of the Engineer at the Contractor's expense.

#### **System Components:**

The system shall consist of video transmitter(s) (ADPRO Fast Tx or approved equal) or a high-speed Internet modem(s), a Cisco Router, and related connection cables.

#### **High-Speed Internet Modem:**

The high-speed Internet modem shall be provided by the County or the Internet Service Provider.

The Cisco Router shall be procured from Delcan, the County's Passage engineering consultant. Delcan shall program this equipment for the appropriate location in the County's communication network.

Basis of payment. This item will be paid for at the contract unit price each for VIDEO TRANSMISSION SYSTEM, which price shall be payment in full for furnishing and/or relocating all associated equipment required, installing the system complete and in place, and placing the system in operation to the satisfaction of the Engineer

### **COMMUNICATIONS CABINET**

This specification sets forth the minimum requirements for a communications cabinet to be installed at the location(s) shown in the plans.

The Communications Cabinet shall be a Model 332 (Type 170) Controller Cabinet, with heat exchanger, or approved equal. The heat exchanger shall be thermostatically controlled to maintain the temperature between 32°F and 122°F within the enclosure. The cabinet shall be constructed of 0.125"-thickness, alloy-5052 sheet aluminum. The surface shall have a smooth, natural aluminum mill finish. The cabinet shall measure 24" wide x 30" deep x 55" high.

The communications cabinet shall have front and rear doors of NEMA type 3R construction with cellular neoprene gasket that is rain tight. Door hinges shall be continuous 14-gauge stainless steel and shall be secured with ¼-20 stainless steel carriage bolts. Standard equipment shall include a three-point locking system that secures the door at the top, bottom and center. A corbin lock with two keys shall also be furnished. The front and rear doors shall be equipped with a two-position doorstop, one at 90° and one at 120°. Door locking rods are ¼" x ¾" aluminum turned edgeways with 1" nylon rollers. Door handles shall be cast aluminum.

The front and rear doors shall be equipped with alarm switches wired to an I/O module. The I/O module shall be connected to the Layer III network switch to transmit door open and closed alarms to the TMC. The I/O device shall be a Moxa E2210, Advantech ADAM-6050, or approved equal meeting the following requirements:

- 10/100BaseT LAN connection
- Supports Modbus/TCP over a TCP/IP network
- Minimum of 8 digital dry-contact inputs (logic level 0 = short to GND, logic level 1 = open)
- -10C to +60C Power: 24VDC nominal
- Mounting: DIN rail

The communications cabinet shall be base mounted and equipped with inside flanges and anchoring holes in the front and back of the cabinet for anchoring to a base.

The communications cabinet shall be equipped with a 19" Electronic Industries Association (EIA) rack using 1.75" hole spacing for the purpose of mounting rack-mountable cabinet equipment. The cabinet shall include a fiber optic connector housing, Corning Cable Systems CCH-04U, or approved equal, and a splice housing, Corning Cable Systems CSH-03U, or approved equal, mounted on the 19" rack.

The communications cabinet shall also be equipped with a 15A rackmount power distribution unit and a pull-out drawer/ shelf assembly.

The heat exchanger handles the air inside the communication cabinet, as necessary, to maintain the equipment within the desired temperature range. Therefore, the cabinet shall be fully enclosed, with no louvers in any doors or side panels. No fans or thermostats shall be installed in the communication cabinet.



A power panel shall be included with the cabinet and shall include the following:

- 50-amp circuit breaker. This circuit breaker shall supply power to all devices in the cabinet.
- The main breaker shall be thermal magnetic type, U.L. listed for HACR service, with a minimum of 20,000 amp interrupting capacity.
- Two 15-amp load breakers with minimum 10,000 amp interrupting capacity.
- Two 20-amp load breakers with minimum 10,000 amp interrupting capacity.
- Atlantic Scientific ZoneIT Model 91391 base station, Model 91375 ZoneIT pluggable module (50kA rating) surge arrestor, with LED status indicators, or approved equivalent.
- A 15-position neutral bus bar capable of connecting three #12 wires per position.
- A 7-position ground bus bar capable of connecting three #12 wires per position.
- A NEMA type 5-15R GFI convenience outlet.

The heat exchanger shall be mounted on the side of the communications cabinet and conform to the following specifications.

- Maximum dimensions of 47 inches high x 15 inches wide x 11 inches deep
- The unit shall provide closed-loop system cooling and heating. (Heater option shall be included with the unit.)
- Unit shall be fully gasketed and maintain the NEMA 3R enclosure rating
- Shall utilize a high efficiency, convoluted, refrigerant-free, aluminum heat transfer element
- Shall operate under maximum enclosure temperature of 150°F and maximum ambient temperature of 131°F
- The unit shall dissipate a minimum of 54 Watts per °F
- Shall operate on 115 VAC, 60 Hz
- The heat exchanger shall be hard-wired to the communications cabinet power supply.
- Unit shall be UL listed

Basis of payment. This item will be paid for at the contract unit price each for COMMUNICATIONS CABINET, which price shall be payment in full for furnishing all associated equipment and labor, and installing the cabinet as shown on the plans and to the satisfaction of the Engineer. The Layer III switch, fiber optic splices and terminations, the video transmission system, if applicable, and the concrete foundation for the cabinet shall be paid for separately.

### **LAYER II (DATA LINK) SWITCH**

This specification sets forth the minimum requirements for a layer II Ethernet switch that will transmit data from one traffic signal cabinet to another traffic signal cabinet containing a layer II switch or a layer III (Network) switch. The layer II switch shall be a Cisco Catalyst 2955 Series Intelligent Ethernet Switch, or approved equal.

The Layer II (Data Link) Switch shall be procured from Delcan, the County's Passage engineering consultant. Delcan shall program this equipment for the appropriate location in the County's communication network.

The layer II switch and its power supply shall be mounted to either a standard DIN rail or an equipment mounting channel in the cabinet. The power supply shall be hard-wired to the cabinet power, not plugged into one of the traffic signal cabinet power outlets.

Basis of Payment. This item will be paid for at the contract unit price each for LAYER II (DATA LINK) SWITCH, which price shall be payment in full for furnishing and installing the switch, and all necessary connectors, cables, fiber optic jumpers, hardware, software, other peripheral equipment, and placing it in operation to the satisfaction of the Engineer. The VIDEO

ENCODER, MEDIA CONVERTERS, and TERMINAL SERVERS shall be paid for separately.

**LAYER III (NETWORK) SWITCH**

This specification sets forth the minimum requirements for a layer III switch that will transmit video data from one traffic signal cabinet to another traffic signal cabinet or to another location having a layer III switch. The layer III switch shall be a Cisco Catalyst 3560 Series Intelligent Ethernet Switch, or approved equal.

The Layer III (Network) Switch shall be procured from Delcan, the County's Passage engineering consultant. Delcan shall program this equipment for the appropriate location in the County's communication network.

The layer III switch shall be mounted to the 19-inch equipment rack inside the cabinet. The layer III switch shall be plugged into the 15A power distribution unit inside the cabinet.

Basis of Payment. This item will be paid for at the contract unit price each for LAYER III (NETWORK) SWITCH, which price shall be payment in full for furnishing and installing the switch, and all necessary connectors, cables, fiber optic jumpers, hardware, software, other peripheral equipment, and placing it in operation to the satisfaction of the Engineer. The VIDEO ENCODER, LAYER III FIBER OPTIC TRANSCEIVER MODULES, MEDIA CONVERTERS, and TERMINAL SERVERS shall be paid for separately.

**FIBER OPTIC TRANSCEIVER MODULE, SFP TYPE, LONG DISTANCE**

This specification sets forth the minimum requirements for a fiber optic transceiver module that plugs into a Cisco layer III gigabit ethernet switch. The module shall be a small form pluggable (SFP), long distance, single mode transceiver, Cisco GLC-LH-SM, or approved equivalent. The transceiver shall be installed in the Cisco layer III switch at the location shown on the plans.

Basis of payment. This item will be paid for at the contract unit price each for FIBER OPTIC TRANSCEIVER MODULE, SFP TYPE, LONG DISTANCE, which price shall be payment in full for furnishing and installing the module, and all necessary connectors, cables, hardware, software, other peripheral equipment, and placing it in operation to the satisfaction of the Engineer.

**FIBER OPTIC TRANSCEIVER MODULE, SFP TYPE, EXTRA LONG DISTANCE**

This specification sets forth the minimum requirements for a fiber optic transceiver module that plugs into a Cisco layer III gigabit ethernet switch. The module shall be a small form pluggable (SFP), extra-long distance, single mode transceiver, Cisco GLC-ZX-SM, or approved equivalent. The transceiver shall be installed in the Cisco layer III switch at the location shown on the plans.

Basis of payment. This item will be paid for at the contract unit price each for FIBER OPTIC TRANSCEIVER MODULE, SFP TYPE, EXTRA LONG DISTANCE, which price shall be payment in full for furnishing and installing the module, and all necessary connectors, cables, hardware, software, other peripheral equipment, and placing it in operation to the satisfaction of the Engineer.

**FIBER OPTIC TRANSCEIVER MODULE, GBIC TYPE, LONG DISTANCE**

This specification sets forth the minimum requirements for a fiber optic transceiver module that plugs into a Cisco layer III gigabit ethernet switch. The module shall be a Gigabit Interface Converter (GBIC) type, long distance, single mode transceiver, Cisco WS-G5486, or approved equivalent. The transceiver shall be installed in the Cisco layer III switch at the location shown

on the plans. This type of transceiver module is intended for use with earlier models of Cisco layer III switches.

Basis of payment. This item will be paid for at the contract unit price each for FIBER OPTIC TRANSCEIVER MODULE, GBIC TYPE, LONG DISTANCE, which price shall be payment in full for furnishing and installing the module, and all necessary connectors, cables, hardware, software, other peripheral equipment, and placing it in operation to the satisfaction of the Engineer.

**FIBER OPTIC TRANSCEIVER MODULE, GBIC TYPE, EXTRA LONG DISTANCE**

This specification sets forth the minimum requirements for a fiber optic transceiver module that plugs into a Cisco layer III gigabit Ethernet switch. The module shall be a Gigabit Interface Converter (GBIC) type, extra long distance, single mode transceiver, Cisco WS-G5487, or approved equivalent. The transceiver shall be installed in the Cisco layer III switch at the location shown on the plans. This type of transceiver module is intended for use with earlier models of Cisco layer III switches.

Basis of payment. This item will be paid for at the contract unit price each for FIBER OPTIC TRANSCEIVER MODULE, GBIC TYPE, EXTRA LONG DISTANCE, which price shall be payment in full for furnishing and installing the module, and all necessary connectors, cables, hardware, software, other peripheral equipment, and placing it in operation to the satisfaction of the Engineer.

**VIDEO ENCODER**

This specification sets forth the minimum requirements for a video encoder that will transmit video data from one traffic signal cabinet to another traffic signal cabinet or to another location having a layer three switch.

The video encoder shall be an Optelecom Model C-50e MPEG-4 video encoder/decoder, or an Optelecom Model C-54e E-MC 4-channel MPEG-4 encoder, as shown on the plans, or approved equivalent. Other video encoder/decoders submitted for approval must be compatible with the Lake County Passage Advanced Traffic Management System (ATMS) software and VideoLAN VLC Media Player Release 0.8.6D or later.

The VIDEO ENCODER shall be procured from Delcan, the County's Passage engineering consultant. Delcan shall program this equipment for the appropriate location in the County's communication network.

The video encoder shall be mounted on a 16 gauge (min.) aluminum plate, and the plate shall be mounted to the cabinet side rails.

The power supply shall be mounted to either a standard DIN rail or an equipment mounting channel in the cabinet. The power supply shall be hard-wired to the cabinet power, not plugged into one of the traffic signal cabinet power outlets.

Basis of payment. This item will be paid for at the contract unit price each for VIDEO ENCODER, which price shall be payment in full for furnishing and installing the encoder, and all necessary connectors, cables, hardware, software, other peripheral equipment, and placing it in operation to the satisfaction of the Engineer.

**MEDIA CONVERTER**

This specification sets forth the minimum requirements for an unmanaged Ethernet switch that

performs copper-to-fiber media conversion at 10/100Mbps speeds.

The media converter shall be a Ruggedcom RMC40 Series, (Model RMC40-HI-C200) four-port, unmanaged Ethernet switch, or approved equivalent. The power supply shall be the HI voltage type (85-264VAC) and ports 3 and 4 shall be for single-mode fiber with SC connectors.

The media converter shall be mounted to either a standard DIN rail or an equipment mounting channel in the cabinet. The power supply shall be hard-wired to the traffic signal cabinet power, not plugged into one of the traffic signal cabinet power outlets. When the media converter is mounted within a communications cabinet, the power supply shall be connected to the power distribution center.

Basis of payment. This item will be paid for at the contract unit price each for MEDIA CONVERTER, which price shall be payment in full for furnishing and installing the media converter, and all necessary connectors, cables, fiber optic jumpers, hardware, software, other peripheral equipment, and placing it in operation to the satisfaction of the Engineer.

### **TERMINAL SERVER**

This specification sets forth the minimum requirements for a terminal server that will transmit signal controller data from one or more traffic signal controllers onto the Lake County PASSAGE Gigabit Ethernet network.

The terminal server shall be a Digi PortServer TS Hcc 4 four-port serial-to-Ethernet device, or approved equivalent, installed at the location shown on the plans. The terminal server shall be properly configured for its location within the Lake County PASSAGE Network, and for proper communication with the signal equipment being connected to it.

Basis of payment. This item will be paid for at the contract unit price each for TERMINAL SERVER, which price shall be payment in full for furnishing, installing, and configuring the terminal server, and all necessary connectors, cables, hardware, software, other peripheral equipment, and placing it in operation to the satisfaction of the Engineer.

### **FIBER OPTIC CABLE**

Add the following to Section 871 and Section 1076.02 of the "Standard Specifications":

This work shall consist of furnishing and installing Fiber Optical cable in conduit with all accessories and connectors. The cable shall be of the type, size, and the number of fibers specified with twelve fibers per buffer tube.

The distribution enclosure shall be a Corning Model WIC-04P Wall-Mountable Interconnect Center, or approved equivalent, capable of accommodating the required number of fibers. The distribution enclosure shall be included in the cost of the fiber optic cable, including connections to any existing cables.

All fibers being terminated shall be connected to the distribution enclosure and labeled at the connector and also at the enclosure bulkhead. The label shall include the direction and also the fiber number (e.g. S1, S2, N11, N12).

All splices and terminations on the installed fiber optic cable shall be included in the cost of the fiber optic cable. The splicing of the installed fiber optic cable to any existing fiber optic cable shall be included in the cost of this pay item.

All terminations and splices required only on existing fiber optic cable shall be paid for separately in accordance with the pay item TERMINATE FIBER IN CABINET or SPLICE FIBER IN CABINET.

The quality of the fiber optic cable, including all splices and terminations, shall be verified by testing and documentation in accordance with Article 801.13(d) of the "Standard Specifications", to the satisfaction of the Engineer.

**Multimode:** The contractor shall coordinate with the equipment vendor, and shall terminate as many multimode fibers as are necessary to establish proper communications with signal controllers and/or video transmission equipment. In addition, the contractor shall terminate four unused multimode fibers and attach them to the distribution enclosure. All multimode terminations shall be ST compatible connectors with ceramic ferrules.

**Singlemode:** The contractor shall splice and/or terminate the number of singlemode fibers shown on the project plans, if any. Singlemode fiber terminations shall utilize pre-fabricated, factory-terminated pigtailed fusion spliced to bare fibers. The pre-fabricated pigtailed shall have all of their fibers color coded to match the singlemode fibers in the fiber optic cable. All fusion splices shall be secured on Corning splice trays, Models M67-068, M67-110, or approved equivalent, capable of accommodating the required number of fusion splices. All single-mode connectors shall be SC compatible, with ceramic ferrules.

A minimum of 13 feet of slack cable shall be provided for the controller cabinet. The controller cabinet slack cable shall be stored as directed by the Engineer.

Fiber Optic cable may be gel filled or have an approved water blocking tape.

**Basis of Payment.** The work shall be paid for at the contract unit price per foot for FIBER OPTIC CABLE IN CONDUIT, NO. 62.5/125, 24 FIBER (12 MULTIMODE AND 12 SINGLEMODE), (FIBER OPTIC CABLE IN CONDUIT, 24 SINGLEMODE) or as specified in plans for the cable in place, including distribution enclosure(s), all connectors, pigtailed, splice trays, connector bulkheads, testing and documentation, and the required number of fiber splices and terminations described in the plans. Additional fiber terminations and/or splices required by the Engineer, (not included in this item), shall be paid for as TERMINATE FIBER IN CABINET and/or SPLICE FIBER IN CABINET.

#### **TERMINATE FIBER IN CABINET**

This work shall consist of terminating existing or new fibers in field cabinets or buildings as indicated on the plans or as directed by the Engineer.

All multi-mode connectors shall be ST compatible, with ceramic ferrules. Singlemode fiber terminations shall utilize pre-fabricated, factory-terminated (SC compatible) pigtailed fusion spliced to bare fibers. . The pre-fabricated pigtailed shall have all of their fibers color coded to match the singlemode fibers in the fiber optic cable. All fusion splices shall be secured on Corning splice trays, Models M67-068, M67-110, or approved equivalent, capable of accommodating the required number of fusion splices. Splice trays and connector bulkheads shall be included in the cost of TERMINATE FIBER IN CABINET, and shall not be paid for separately. Connector bulkheads shall be the proper type for the fiber enclosure at the location, and shall be properly secured to the enclosure.

The quality of all fiber splices shall be verified by testing and documentation in accordance with

Article 801.13(d) of the "Standard Specifications", to the satisfaction of the Engineer.

Basis of payment. This work shall be paid for at the contract unit price each for each fiber terminated in a field cabinet or inside a building as TERMINATE FIBER IN CABINET, which will be payment in full for terminating each required multimode or singlemode fiber, including all connectors, pigtails, splice trays, bulkheads, testing and documentation. The splicing of pigtails for singlemode fibers is included in the cost of TERMINATE FIBER IN CABINET, and shall not be paid for separately. This pay item shall not be used to pay for fiber terminations and/or splices completed to meet the requirements of FIBER OPTIC CABLE IN CONDUIT.

### **SPLICE FIBER IN CABINET**

This work shall consist of fusion splicing singlemode fibers in a field cabinet or inside a building as indicated on the plans and as directed by the Engineer. Splices shall be secured in fiber optic splice trays within fiber optic distribution enclosures. The splice trays shall be Corning Models M67-068, M67-110, or approved equivalent, capable of accommodating the required number of fusion splices. Splice trays shall be included in the cost of SPLICE FIBER IN CABINET and shall not be paid for separately.

The quality of all fiber splices shall be verified by testing and documentation in accordance with Article 801.13(d) of the "Standard Specifications", to the satisfaction of the Engineer.

All optical fibers shall be spliced to provide continuous runs. Splices shall only be allowed in equipment cabinets except where otherwise shown on the Plans.

All splices shall be made using a fusion splicer that automatically positions the fibers using a system of light injection and detection. The Contractor shall provide all equipment and consumable supplies.

Basis of payment. This work shall be paid for at the contract unit price each for SPLICE FIBER IN CABINET, which will be payment in full for all fusion splicing, fiber optic splice trays, testing and documentation, at a cabinet or building location shown on the plans and as directed by the Engineer. This pay item shall not be used to pay for fiber terminations and/or splices completed to meet the requirements of FIBER OPTIC CABLE IN CONDUIT.

### **FIBER OPTIC TRACER CABLE**

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

In order to trace the fiber optic cable after installation, an XLP black insulated copper cable No. 14 shall be pulled in the same conduit as the fiber optic cable. The tracer cable shall be continuous, and extend a minimum of 3 feet into the controller cabinet. The tracer cable shall be clearly marked and identified. In order to minimize the number of splices required, the tracer cable shall incorporate maximum lengths of cable supplied by the manufacturer. Splicing of the tracer cable will be allowed at the handholes only. The tracer cable splice shall use a Western Union splice soldered with resin core flux. All exposed surfaces of the solder shall be smooth. Splices shall be soldered using a soldering iron. Blowtorches or other devices which oxidize copper cable shall not be allowed for soldering operations. The splice shall be covered with underwater grade WCSMW 30/100 heat shrink tube, minimum length four (4) inches and with a minimum one (1) inch coverage over the XLP insulation.

Basis of payment. The tracer cable shall be paid for separately as ELECTRIC CABLE IN

CONDUIT, TRACER, NO. 14 1C per foot, which price shall include all associated labor and material for installation.

**WIRELESS TRANSMISSION SYSTEM SHORT RANGE**

This work shall consist of the installation of a new node on the Lake County PASSAGE wireless network. This item includes the directional antenna and power injector, associated cables / wiring, and all mounting hardware.

The WIRELESS TRANSMISSION SYSTEM SHORT RANGE includes:

- One (1) Proxim TsunamiMP.11 5054-R Subscriber unit with Integrated 23dBi Antenna (Model 5054-SUR-US) or approved equivalent.
- Two (2) Proxim Model 76394 surge suppressors, or approved equivalent.
- Power wiring from the radio power injector to the circuit breaker.
- All mounting hardware.

All components of this item shall be installed as shown on the plans. The radio transceiver and antenna shall be installed as high as possible on the mast arm assembly pole. The antenna shall be directed / aimed at another antenna on the County's wireless system, (e.g. aimed at a sector antenna on a water tower), as shown on the plans and as directed by the Engineer. The power injector shall be installed inside the traffic signal cabinet.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The WIRELESS TRANSMISSION SYSTEM SHORT RANGE electronics shall be procured from Delcan, the County's Passage engineering consultant. Delcan shall program this equipment for the appropriate location in the County's communication network.

Basis of payment. This item will be paid for at the contract unit price each for WIRELESS TRANSMISSION SYSTEM SHORT RANGE, which price shall be payment in full for furnishing and installing the power injector, antenna, and all associated connectors, cables, hardware, and other peripheral equipment, and placing it in operation to the satisfaction of the Engineer. The Outdoor Rated Network Cable from the antenna to the traffic signal cabinet shall be paid for separately.

**WIRELESS TRANSMISSION SYSTEM LONG RANGE**

This work shall consist of the installation of a new node on the Lake County PASSAGE wireless network. This item includes the directional antenna and power injector, associated cables / wiring, and all mounting hardware.

The WIRELESS TRANSMISSION SYSTEM LONG RANGE includes:

- One (1) Proxim TsunamiMP.11 5054-R-LR Subscriber unit for extended range with Integrated 23dBi Antenna (Model 5054-SUR-LR-US) or approved equivalent.
- Two (2) Proxim Model 76394 surge suppressors, or approved equivalent.
- Power wiring from the radio power injector to the circuit breaker.
- All mounting hardware.

All components of this item shall be installed as shown on the plans. The radio transceiver and antenna shall be installed as high as possible on the mast arm assembly pole. The antenna shall be directed / aimed at another antenna on the County's wireless system, (e.g. aimed at a

sector antenna on a water tower), as shown on the plans and as directed by the Engineer. The power injector shall be installed inside the traffic signal cabinet.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The WIRELESS TRANSMISSION SYSTEM LONG RANGE electronics shall be procured from Delcan, the County's Passage engineering consultant. Delcan shall program this equipment for the appropriate location in the County's communication network.

Basis of payment. This item will be paid for at the contract unit price each for WIRELESS TRANSMISSION SYSTEM LONG RANGE, which price shall be payment in full for furnishing and installing the power injector, antenna, and all associated connectors, cables, hardware, and other peripheral equipment, and placing it in operation to the satisfaction of the Engineer. The Outdoor Rated Network Cable from the antenna to the traffic signal cabinet shall be paid for separately.

#### **WIRELESS TRANSMISSION SYSTEM EXTRA LONG RANGE**

This work shall consist of the installation of a new node on the Lake County PASSAGE wireless network. This item includes the radio, directional antenna and power injector, associated cables / wiring, and all mounting hardware.

The WIRELESS TRANSMISSION SYSTEM EXTRA LONG RANGE includes:

- One (1) Proxim TsunamiMP.11 (Model 5054-SUA-LR-US) Subscriber unit for extended range with type N connector
- One (1) RadioWaves 28dBi Antenna (Model FP2-5-28) or approved equivalent.
- One (1) low loss RF coaxial cable, 3 foot, N to N
- Two (2) Proxim Model 76394 surge suppressors, or approved equivalent.
- Power wiring from the radio power injector to the circuit breaker.
- All mounting hardware.

All components of this item shall be installed as shown on the plans. The radio transceiver and antenna shall be installed as high as possible on the mast arm assembly pole. The antenna shall be directed / aimed at another antenna on the County's wireless system, (e.g. aimed at a sector antenna on a water tower), as shown on the plans and as directed by the Engineer. The power injector shall be installed inside the traffic signal cabinet.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The WIRELESS TRANSMISSION SYSTEM EXTRA LONG RANGE electronics shall be procured from Delcan, the County's Passage engineering consultant. Delcan shall program this equipment for the appropriate location in the County's communication network.

Basis of payment. This item will be paid for at the contract unit price each for WIRELESS TRANSMISSION SYSTEM EXTRA LONG RANGE, which price shall be payment in full for furnishing and installing the power injector, antenna, and all associated connectors, cables, hardware, and other peripheral equipment, and placing it in operation to the satisfaction of the Engineer. The Outdoor Rated Network Cable from the radio to the traffic signal cabinet shall be paid for separately.



**WIRELESS TRANSMISSION SYSTEM POINT TO POINT**

This work shall consist of the installation of a new node on the Lake County PASSAGE wireless network. This item includes the directional antenna and power injector, associated cables / wiring, and all mounting hardware.

The WIRELESS TRANSMISSION SYSTEM POINT TO POINT includes:

- One (1) Proxim Tsunami Quick Bridge unit with Integrated 23dBi Antenna (Model QB-8150-LINK-US) or approved equivalent.
- Two (2) Proxim Model 76394 surge suppressors, or approved equivalent.
- Power wiring from the radio power injector to the circuit breaker.
- All mounting hardware.

All components of this item shall be installed as shown on the plans. The radio transceiver and antenna shall be installed as high as possible on the mast arm assembly pole. The antenna shall be directed / aimed at another antenna on the County's wireless system, (e.g. aimed at corresponding antenna at other intersection), as shown on the plans and as directed by the Engineer. The power injector shall be installed inside the traffic signal cabinet.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The WIRELESS TRANSMISSION SYSTEM POINT TO POINT electronics shall be procured from Delcan, the County's Passage engineering consultant. Delcan shall program this equipment for the appropriate location in the County's communication network.

Basis of payment. This item will be paid for at the contract unit price each for WIRELESS TRANSMISSION SYSTEM POINT TO POINT, which price shall be payment in full for furnishing and installing the power injector, antenna, and all associated connectors, cables, hardware, and other peripheral equipment, and placing it in operation to the satisfaction of the Engineer. The Outdoor Rated Network Cable from the antenna to the traffic signal cabinet shall be paid for separately.

**WIRELESS TRANSMISSION SYSTEM BACKHAUL**

This work shall consist of the installation of a new node on the Lake County PASSAGE wireless network. This item includes the directional antenna and power injector, associated cables / wiring, and all mounting hardware.

The WIRELESS TRANSMISSION SYSTEM BACKHAUL includes:

- One (1) Proxim Tsunami licensed backhaul radio (Model **GX-800**) or approved equivalent.
- One (1) 2 foot dish antenna or other as specified on plans
- Two (2) Proxim Model 76394 surge suppressors, or approved equivalent.
- Power wiring from the radio power injector to the circuit breaker.
- All mounting hardware.

All components of this item shall be installed as shown on the plans. The radio transceiver and antenna shall be installed as high as possible on the mast arm assembly pole or tower as shown on plans. The antenna shall be directed / aimed at another antenna on the County's wireless system, (e.g. aimed at corresponding antenna at other intersection / tower), as shown on the plans and as directed by the Engineer. The power injector shall be installed inside the traffic signal / grade level cabinet.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The WIRELESS TRANSMISSION SYSTEM BACKHAUL electronics shall be procured from Delcan, the County's Passage engineering consultant. Delcan shall program this equipment for the appropriate location in the County's communication network.

Basis of payment. This item will be paid for at the contract unit price each for WIRELESS TRANSMISSION SYSTEM BACKHAUL, which price shall be payment in full for furnishing and installing the power injector, antenna, and all associated connectors, cables, hardware, and other peripheral equipment, and placing it in operation to the satisfaction of the Engineer. The Outdoor Rated Network Cable from the antenna to the traffic signal cabinet shall be paid for separately.

### **WIRELESS TRANSMISSION SYSTEM BASE STATION**

This work shall consist of the installation of a new node on the Lake County PASSAGE wireless network. This item includes the directional antenna and power injector, associated cables / wiring, and all mounting hardware.

The WIRELESS TRANSMISSION SYSTEM BASE STATION includes:

- One (1) Proxim Tsunami base station long range unit (Model 5054-BSU-R-LR) or approved equivalent.
- One (1) 60 degree sector antenna or other as shown on the plans.
- Two (2) Proxim Model 76394 surge suppressors, or approved equivalent.
- Power wiring from the radio power injector to the circuit breaker.
- All mounting hardware and poles.

All components of this item shall be installed as shown on the plans. The radio transceiver and antenna shall be installed on a new mounting pole or other as shown on the plans. The antenna shall be directed / aimed according to the azimuth settings listed in the plans and as directed by the Engineer. The power injector shall be installed inside the cabinet.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The WIRELESS TRANSMISSION SYSTEM BASE STATION electronics shall be procured from Delcan, the County's Passage engineering consultant. Delcan shall program this equipment for the appropriate location in the County's communication network.

Basis of payment. This item will be paid for at the contract unit price each for WIRELESS TRANSMISSION SYSTEM BASE STATION, which price shall be payment in full for furnishing and installing the power injector, antenna, and all associated connectors, cables, hardware, and other peripheral equipment, and placing it in operation to the satisfaction of the Engineer. The Outdoor Rated Network Cable from the antenna to the cabinet shall be paid for separately.

### **RELOCATE EXISTING VIDEO DETECTION SYSTEM (COMPLETE INTERSECTION)**

This work shall consist of the removal, storage, and relocation of an existing video detection system (complete intersection) from one traffic signal installation (temporary or permanent) to another traffic signal installation (temporary or permanent). This item shall also include the relocation of the remote-controlled video system according to the plans.

The video detection system (complete intersection) shall be removed and relocated as shown in the plans. Any damage sustained to the video detection system during removal, storage, transport, and/or reinstallation operations shall be repaired or replaced in kind to the satisfaction of the Engineer at the Contractor's expense.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

Basis of payment. This item will be paid for at the contract unit price each for RELOCATE EXISTING VIDEO DETECTION SYSTEM (COMPLETE INTERSECTION), which price shall be payment in full for disconnecting the existing video detection system, remote-controlled video system, packaging/storing it, transporting it, and relocating it to the new location complete and operating to the satisfaction of the Engineer.

**RELOCATE EXISTING REMOTE-CONTROLLED VIDEO SYSTEM**

This work shall consist of the removal, storage, and relocation of an existing remote-controlled video system from one traffic signal installation (temporary or permanent) to another traffic signal installation (temporary or permanent). This pay item shall be used when only the remote-controlled video system is being relocated. This pay item shall not be used when the remote-controlled video system is being relocated as part of RELOCATE EXISTING VIDEO DETECTION SYSTEM (COMPLETE INTERSECTION).

The remote-controlled video system shall be removed and relocated as shown in the plans. Any damage sustained to the remote-controlled video system during removal, storage, transport, and/or reinstallation operations shall be repaired or replaced in kind to the satisfaction of the Engineer at the Contractor's expense.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

Basis of payment. This item will be paid for at the contract unit price each for RELOCATE EXISTING REMOTE-CONTROLLED VIDEO SYSTEM, which price shall be payment in full for disconnecting the existing remote-controlled video system, packaging/storing it, transporting it, and relocating it to the new location complete and operating to the satisfaction of the Engineer.

**RELOCATE EXISTING SWITCH**

This work shall consist of the removal, storage, and relocation of an existing layer two or layer three switch from one traffic signal installation to another traffic signal installation.

The switch shall be removed and relocated as shown in the plans. Any damage sustained to the switch during removal, storage, transport, and/or reinstallation operations shall be repaired or replaced in kind to the satisfaction of the Engineer at the Contractor's expense.

Basis of payment. This item will be paid for at the contract unit price each for RELOCATE EXISTING SWITCH, which price shall be payment in full for disconnecting the existing switch, packaging/storing it, transporting it, and relocating it to the new location complete and operating to the satisfaction of the Engineer. This item shall also include the relocation and reinstallation of the switch power supply, and all fiber optic jumper cables necessary for proper operation.

**TEMPORARY TRAFFIC SIGNAL TIMING**

This work shall consist of developing and maintaining appropriate traffic signal timings for the specified intersection for the entirety of the construction project beginning with any changes to the existing traffic patterns including lane shifts or lane reductions. This shall include the period prior to the turn-on of any temporary traffic signal installation. This item can also be utilized to make temporary timing adjustments to existing traffic signals required by detours or other temporary conditions.

All timings and adjustments necessary for this work shall be performed by an approved Consultant who has previous experience in optimizing Closed Loop Traffic signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 705-4424 for a listing of approved Consultants.

The following tasks are associated with TEMPORARY TRAFFIC SIGNAL TIMINGS.

- (a) Consultant shall attend temporary traffic signal inspection (turn-on) and/or detour meeting and conduct on-site implementation of the traffic signal timings. Make fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.
- (b) Consultant shall provide monthly observation of traffic signal operations in the field.
- (c) Consultant shall provide on-site consultation and adjust timings as necessary for construction stage changes, temporary traffic signal phase changes, and any other conditions affecting timing and phasing, including lane closures, detours, and other construction activities.
- (d) Consultant shall make timing adjustments and prepare comment responses as directed by the Area Traffic Signal Operations Engineer.

Basis of Payment. The work shall be paid for at the contract unit price each for TEMPORARY TRAFFIC SIGNAL TIMING, which price shall be payment in full for performing all work described herein per intersection. When the temporary traffic signal installation is turned on, traffic control is installed, or the detour is implemented, 50 percent of the bid price will be paid. The remaining 50 percent of the bid price will be paid following the removal of the temporary traffic signal installation, traffic control and/or detour.

#### **RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM**

Description. This work shall consist of re-optimizing a closed loop traffic signal system according to the following Levels of work.

LEVEL I applies when improvements are made to an existing signalized intersection within an existing closed loop traffic signal system. The purpose of this work is to integrate the improvements to the subject intersection into the signal system while minimizing the impacts to the existing system operation. This type of work would be commonly associated with the addition of signal phases, pedestrian phases, or improvements that do not affect the capacity at an intersection.

LEVEL II applies when improvements are made to an existing signalized intersection within an existing closed loop traffic signal system and detailed analysis of the intersection operation is desired by the engineer, or when a new signalized or existing signalized intersection is being added to an existing system, but optimization of the entire system is not required. The purpose of this work is to optimize the subject intersection, while integrating it into the existing signal system with limited impact to the system operations. This item also includes an evaluation of the overall system operation, including the traffic responsive program.

For the purposes of re-optimization work, an intersection shall include all traffic movements operated by the subject controller and cabinet.

After the signal improvements are completed, the signal shall be re-optimized as specified by an approved Consultant who has previous experience in optimizing Closed Loop Traffic Signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 377-7000 for a listing of approved Consultants. Traffic signal system optimization work, including fine-tuning adjustments of the optimized system, shall follow the requirements stated in the most recent IDOT District 1 SCAT Guidelines, except as note herein.

All work shall be based upon the LCDOT Countywide Synchro model. The Consultant shall contact the LCDOT at 847-377-7000 to acquire the required portion of the countywide model to be updated for the particular project. Upon completion of the project, the Consultant shall provide the LCDOT with the revised and updated files for inclusion into the Countywide Synchro Model.

The Consultant shall confer with the Traffic Signal Engineer prior to optimizing the system to determine if any extraordinary conditions exist that would affect traffic flows in the vicinity of the system, in which case, the Consultant may be instructed to wait until the conditions return to normal or to follow specific instructions regarding the optimization.

(a) LEVEL I Re-Optimization

1. The following tasks are associated with LEVEL I Re-Optimization.
  - a. Appropriate signal timings shall be developed for the subject intersection and existing timings shall be utilized for the rest of the intersections in the system.
  - b. Proposed signal timing plan for the new or modified intersection(s) shall be forwarded to the County for review prior to implementation.
  - c. Consultant shall conduct on-site implementation of the timings at the turn-on and make fine-tuning adjustments to the timings of the subject intersection in the field to alleviate observed adverse operating conditions and to enhance operations.
  - d. All patterns associated with Transit Signal Priority and Incident Response Plans are to be reviewed and adjusted as required.
2. The following deliverables shall be provided for LEVEL I Re-Optimization.
  - a. Consultant shall furnish to the County a cover letter describing the extent of the re-optimization work performed.

(b) LEVEL II Re-Optimization

1. In addition to the requirements described in the LEVEL I Re-Optimization above, the following tasks are associated with LEVEL II Re-Optimization.
  - a. Traffic counts shall be taken at the subject intersection after the traffic signals are approved for operation by the Area Traffic Signal Operations Engineer. Manual turning movement counts shall be conducted from 6:30 a.m. to 9:30 a.m., 11:00 a.m. to 1:00 p.m., and 3:30 p.m. to 6:30 p.m. on a typical weekday from midday Monday to midday Friday. The turning movement counts shall identify cars, and single-unit, multi-unit heavy vehicles, and transit buses.
  - b. Traffic responsive program operation shall be evaluated to verify proper pattern selection and lack of oscillation and a report of the operation shall be provided to

- IDOT.
- c. All patterns associated with Transit Signal Priority and Incident Response Plans are to be reviewed and adjusted as required.
2. The following deliverables shall be provided for LEVEL II Re-Optimization.
- a. Consultant shall furnish to the County one (1) copy of a technical memorandum for the optimized system. The technical memorandum shall include the following elements:
    1. Brief description of the project
    2. Printed copies of the analysis output from Synchro (or other appropriate approved optimization software file)
    3. Printed copies of the traffic counts conducted at the subject intersection
  - b. Consultant shall furnish to the County two (2) CDs for the optimized system. The CDs shall include the following elements:
    1. Electronic copy of the technical memorandum in PDF format
    2. Revised Synchro files (or other appropriate, approved optimization software file) including the new signal and the rest of the signals in the closed loop system or as identified by the Engineer
    3. Traffic counts conducted at the subject intersection
    4. The CD case shall include a clearly readable label displaying the same information securely affixed to the side and front.

Basis of Payment. This work shall be paid for at the contract unit price each for RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM – LEVEL I or RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM – LEVEL II, which price shall be payment in full for performing all work described herein per intersection. Following completion of the timings and submittal of specified deliverables, 100 percent of the bid price will be paid. Each intersection will be paid for separately.

#### **OPTIMIZE TRAFFIC SIGNAL SYSTEM**

Description. This work shall consist of optimizing a closed loop traffic signal system.

OPTIMIZE TRAFFIC SIGNAL SYSTEM applies when a new or existing closed loop traffic signal system is to be optimized and a formal Signal Coordination and Timing (SCAT) Report is to be prepared. The purpose of this work is to improve system performance by optimizing traffic signal timings, developing a time of day program and a traffic responsive program.

After the signal improvements are completed, the signal system shall be optimized as specified by an approved Consultant who has previous experience in optimizing Closed Loop Traffic Signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 377-7000 for a listing of approved Consultants. Traffic signal system optimization work, including fine-tuning adjustments of the optimized system, shall follow the requirements stated in the most recent IDOT District 1 SCAT Guidelines, except as note herein.

All work shall be based upon the LCDOT Countywide Synchro model. The Consultant shall contact the LCDOT at 847-377-7000 to acquire the required portion of the countywide model to be updated for the particular project. Upon completion of the project, the Consultant shall provide the LCDOT with the revised and updated files for inclusion into the Countywide Synchro Model.

The Consultant shall confer with the Traffic Signal Engineer prior to optimizing the system to determine if any extraordinary conditions exist that would affect traffic flows in the vicinity of the system, in which case, the Consultant may be instructed to wait until the conditions return to normal or to follow specific instructions regarding the optimization.

(a) The following tasks are associated with OPTIMIZE TRAFFIC SIGNAL SYSTEM.

1. Appropriate signal timings and offsets shall be developed for each intersection and appropriate cycle lengths shall be developed for the closed loop signal system or as identified by Engineer.
2. All patterns associated with Transit Signal Priority and Incident Response Plans are to be developed as required.
3. Traffic counts shall be taken at all intersections after the permanent traffic signals are approved for operation by the Area Traffic Signal Operations Engineer. Manual turning movement counts shall be conducted from 6:30 a.m. to 9:30 a.m., 11:00 a.m. to 1:00 p.m., and 3:30 p.m. to 6:30 p.m. on a typical weekday from midday Monday to midday Friday. The turning movement counts shall identify cars, and single-unit and multi-unit heavy vehicles.
4. A traffic responsive program shall be developed, which considers both volume and occupancy. A time-of-day program shall be developed for used as a back-up system.
5. Proposed signal timing plan for the new or modified intersection shall be forwarded to the County for review prior to implementation.
6. Consultant shall conduct on-site implementation of the timings and make fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.
7. Speed and delay studies shall be conducted during each of the count periods along the system corridor in the field before and after implementation of the proposed timing plans for comparative evaluations. These studies should utilize specialized electronic timing and measuring devices.

(b) The following deliverables shall be provided for OPTIMIZE TRAFFIC SIGNAL SYSTEM.

1. Consultant shall furnish to the County one (1) copy of a SCAT Report for the optimized system. The SCAT Report shall include the following elements:

<p><b>Cover Page in color showing a System Map</b></p> <p><b>Figures</b></p> <ol style="list-style-type: none"> <li>1. System overview map – showing system number, system schematic map with numbered system detectors, oversaturated movements, master location, system phone number, cycle lengths, and date of completion.</li> <li>2. General location map in color – showing signal system location in the metropolitan area.</li> <li>3. Detail system location map in color – showing cross street names and local controller addresses.</li> <li>4. Controller sequence – showing controller phase sequence diagrams.</li> </ol>
<p><b>Table of Contents</b></p> <p><b>Tab 1: Final Report</b></p> <ol style="list-style-type: none"> <li>1. Project Overview</li> <li>2. System and Location Description (Project specific)</li> <li>3. Methodology</li> <li>4. Data Collection</li> <li>5. Data Analysis and Timing Plan Development</li> <li>6. Implementation             <ol style="list-style-type: none"> <li>a. Traffic Responsive Programming (Table of TRP vs. TOD Operation)</li> </ol> </li> <li>7. Evaluation             <ol style="list-style-type: none"> <li>a. Speed and Delay runs</li> </ol> </li> </ol>
<p><b>Tab 2: Turning Movement Counts</b></p> <ol style="list-style-type: none"> <li>1. Turning Movement Counts (Showing turning movement counts in the intersection diagram for each period, including truck percentage)</li> </ol>
<p><b>Tab 3: Synchro Analysis</b></p> <ol style="list-style-type: none"> <li>1. AM: Time-Space diagram in color, followed by intersection Synchro report (Timing report) summarizing the implemented timings.</li> <li>2. Midday: same as AM</li> <li>3. PM: same as AM</li> </ol>
<p><b>Tab 4: Speed, Delay Studies</b></p> <ol style="list-style-type: none"> <li>1. Summary of before and after runs results in two (2) tables showing travel time and delay time.</li> <li>2. Plot of the before and after runs diagram for each direction and time period.</li> </ol>
<p><b>Tab 5: Environmental Report</b></p> <ol style="list-style-type: none"> <li>1. Environmental impact report including gas consumption, NO2, HCCO, improvements.</li> </ol>
<p><b>Tab 6: Electronic Files</b></p> <ol style="list-style-type: none"> <li>1. Two (2) CDs for the optimized system. The CDs shall include the following elements:             <ol style="list-style-type: none"> <li>a. Electronic copy of the SCAT Report in PDF format</li> <li>b. Copies of the Synchro files for the optimized system</li> <li>c. Traffic counts for the optimized system</li> <li>d. New or updated intersection graphic display files for each of the system intersections and the system graphic display file including system detector locations and addresses.</li> </ol> </li> </ol>

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



## **IDOT TRAINING PROGRAM GRADUATE ON-THE-JOB TRAINING SPECIAL PROVISION (TPG)**

Effective: August 1, 2012

Revised: February 1, 2014

In addition to the Contractor's equal employment opportunity affirmative action efforts undertaken as elsewhere required by this Contract, the Contractor is encouraged to participate in the incentive program to provide additional on-the-job training to certified graduates of IDOT funded pre-apprenticeship training programs outlined by this Special Provision.

It is the policy of IDOT to fund IDOT pre-apprenticeship training programs throughout Illinois to provide training and skill-improvement opportunities to assure the increased participation of minority groups, disadvantaged persons and women in all phases of the highway construction industry. The intent of this IDOT Training Program Graduate (TPG) Special Provision is to place certified graduates of these IDOT funded pre-apprentice training programs on IDOT project sites when feasible, and provide the graduates with meaningful on-the-job training intended to lead to journey-level employment. IDOT and its sub-recipients, in carrying out the responsibilities of a state contract, shall determine which construction contracts shall include "Training Program Graduate Special Provisions." To benefit from the incentives to encourage the participation in the additional on-the-job training under this Training Program Graduate Special Provision, the Contractor shall make every reasonable effort to employ certified graduates of IDOT funded Pre-apprenticeship Training Programs to the extent such persons are available within a reasonable recruitment area.

Participation pursuant to IDOT's requirements by the Contractor or subcontractor in this Training Program Graduate (TPG) Special Provision entitles the Contractor or subcontractor to be reimbursed at \$15.00 per hour for training given a certified TPG on this contract. As approved by the Department, reimbursement will be made for training persons as specified herein. This reimbursement will be made even though the Contractor or subcontractor may receive additional training program funds from other sources for other trainees, provided such other source does not specifically prohibit the Contractor or subcontractor from receiving other reimbursement. For purposes of this Special Provision the Contractor is not relieved of requirements under applicable federal law, the Illinois Prevailing Wage Act, and is not eligible for other training fund reimbursements in addition to the Training Program Graduate (TPG) Special Provision reimbursement.

No payment shall be made to the Contractor if the Contractor or subcontractor fails to provide the required training. It is normally expected that a TPG will begin training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project through completion of the contract, so long as training opportunities exist in his work classification or until he has completed his training program. Should the TPG's employment end in advance of the completion of the contract, the Contractor shall promptly notify the designated IDOT staff member under this Special Provision that the TPG's involvement in the contract has ended and supply a written report of the reason for the end of the involvement, the hours completed by the TPG under the Contract and the number of hours for which the incentive payment provided under this Special Provision will be or has been claimed for the TPG.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting its performance under this Special Provision.

**METHOD OF MEASUREMENT:** The unit of measurement is in hours.

**BASIS OF PAYMENT:** This work will be paid for at the contract unit price of \$15.00 per hour for certified TRAINEES TRAINING PROGRAM GRADUATE. The estimated total number of hours, unit price and total price have been included in the schedule of prices.

The Contractor shall provide training opportunities aimed at developing full journeyworker in the type of trade or job classification involved. The initial number of TPGs for which the incentive is available under this contract is 6. During the course of performance of the Contract the Contractor may seek approval from the Department for additional incentive eligible TPGs. In the event the Contractor subcontracts a portion of the contract work, it shall determine how many, if any, of the TPGs are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this Special Provision. The Contractor shall also insure that this Training Program Graduate Special Provision is made applicable to such subcontract if the TPGs are to be trained by a subcontractor and that the incentive payment is passed on to each subcontractor.

For the Contractor to meet the obligations for participation in this TPG incentive program under this Special Provision, the Department has contracted with several entities to provide screening, tutoring and pre-training to individuals interested in working in the applicable construction classification and has certified those students who have successfully completed the program and are eligible to be TPGs. A designated IDOT staff member, the Director of the Office of Business and Workforce Diversity (OBWD), will be responsible for providing assistance and referrals to the Contractor for the applicable TPGs. For this contract, the Director of OBWD is designated as the responsible IDOT staff member to provide the assistance and referral services related to the placement for this Special Provision. For purposes of this Contract, contacting the Director of OBWD and interviewing each candidate he/she recommends constitutes reasonable recruitment.

Prior to commencing construction, the Contractor shall submit to the Department for approval the TPGs to be trained in each selected classification. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. No employee shall be employed as a TPG in any classification in which he/she has successfully completed a training course leading to journeyman status or in which he/she has been employed as a journeyman. Notwithstanding the on-the-job training purpose of this TPG Special Provision, some offsite training is permissible as long as the offsite training is an integral part of the work of the contract and does not comprise a significant part of the overall training.

Training and upgrading of TPGs of IDOT pre-apprentice training programs is intended to move said TPGs toward journeyman status and is the primary objective of this Training Program Graduate Special Provision. Accordingly, the Contractor shall make every effort to enroll TPGs by recruitment through the IDOT funded TPG programs to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that it has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance and entitled to the Training Program Graduate Special Provision \$15.00 an hour incentive.

The Contractor or subcontractor shall provide each TPG with a certificate showing the type and length of training satisfactorily completed.



# Illinois Environmental Protection Agency

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

## Division of Water Pollution Control Notice of Intent (NOI) for General Permit to Discharge Storm Water Associated with Construction Site Activities

*This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Permit Section at the above address.*

For Office Use Only

### OWNER INFORMATION

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

Company/Owner Name: Lake County Department of Transportation

Mailing Address: 600 W Winchester Road

Phone: 847-377-7400

City: Libertyville State: IL Zip: 60048

Fax: 847-377-5290

Contact Person: Todd S. Bright

E-mail: TSBright@transystems.com

Owner Type (select one) County

### CONTRACTOR INFORMATION

MS4 Community:  Yes  No

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

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

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

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

### CONSTRUCTION SITE INFORMATION

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

Project Name: FAU 187 (Washington Street)

County: Lake

Street Address: Wash. St.-Haryan to N Lake St City: Grayslake

IL Zip: 60030

Latitude: 42 21 26 Longitude: 88 02 46 22 45N 10E  
(Deg) (Min) (Sec) (Deg) (Min) (Sec) Section Township Range

Approximate Construction Start Date Nov 1, 2014 Approximate Construction End Date Apr 12, 2017

Total size of construction site in acres: 14.3

If less than 1 acre, is the site part of a larger common plan of development?

Yes  No

Fee Schedule for Construction Sites:  
Less than 5 acres - \$250  
5 or more acres - \$750

### STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Has the SWPPP been submitted to the Agency?

Yes  No

(Submit SWPPP electronically to: [epa.constilr10swppp@illinois.gov](mailto:epa.constilr10swppp@illinois.gov))

Location of SWPPP for viewing: Address: 600 W Winchester Road

City: Libertyville

SWPPP contact information:

Contact Name: Todd S. Bright

Inspector qualifications:

P.E. \_\_\_\_\_

Phone: 847-377-7400

Fax: 847-377-5290

E-mail: TSBright@transystems.com

Project inspector, if different from above

Inspector qualifications:

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

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

**TYPE OF CONSTRUCTION (select one)**

Construction Type Reconstruction

SIC Code: 1611, 1622

Type a detailed description of the project:

Washington Street (FAU 187) is an east-west principal arterial which runs through the northern suburbs of Chicago in Lake County. The portion of Washington Street for this project is located in the Village of Grayslake as well as portions of unincorporated Lake County. The project limits are along Washington Street between Haryan Way and North Lake Street, a distance of 0.4 miles. The road will be reconstructed and nominally widened from two lanes to four. Stormwater detention will be provided in a proposed detention basin and in oversized storm sewer. A railroad grade separation and a stormwater pumping station will also be constructed.

**HISTORIC PRESERVATION AND ENDANGERED SPECIES COMPLIANCE**

Has the project been submitted to the following state agencies to satisfy applicable requirements for compliance with Illinois law on:

Historic Preservation Agency     Yes     No

Endangered Species                 Yes     No

**RECEIVING WATER INFORMATION**

Does your storm water discharge directly to:     Waters of the State    or     Storm Sewer

Owner of storm sewer system: Village of Grayslake

Name of closest receiving water body to which you discharge: Mill Creek

Mail completed form to: Illinois Environmental Protection Agency  
Division of Water Pollution Control  
Attn: Permit Section  
Post Office Box 19276  
Springfield, Illinois 62794-9276  
or call (217) 782-0810  
FAX: (217) 782-9891

Or submit electronically to: [epa.constit10swppp@illinois.gov](mailto:epa.constit10swppp@illinois.gov)

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a storm water pollution prevention plan and a monitoring program plan, will be complied with.

*Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))*

Yves D. Blyth  
Owner Signature:

7/1/14  
Date:

Todd S. Blyth  
Printed Name:

Project Manager  
Title:

NPDES Permit No. ILR10

General NPDES Permit No. ILR10  
Modification

Illinois Environmental Protection Agency  
Division of Water Pollution Control  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, Illinois 62794-9276  
[www.epa.state.il.us](http://www.epa.state.il.us)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

General NPDES Permit  
For  
Storm Water Discharges From Construction Site Activities

Expiration Date: July 31, 2018

Issue Date: July 30, 2013

Effective Date: August 1, 2013

Modification Date: April 30, 2014

In compliance with the provisions of the Illinois Environmental Protection Act, the Illinois Pollution Control Board Rules and Regulations (35 Ill. Adm. Code, Subtitle C, Chapter I), and the Clean Water Act, and the regulations thereunder the following discharges are authorized by this permit in accordance with the conditions and attachments herein.



Alan Keller, P.E.  
Manager, Permit Section  
Division of Water Pollution Control

Part I. COVERAGE UNDER THIS PERMIT

A. **Permit Area.** The permit covers all areas of the State of Illinois with discharges to any waters of the State.

B. **Eligibility.**

1. This permit shall authorize all discharges of storm water associated with industrial activity from a construction site that will result in the disturbance of one or more acres total land area or a construction site less than one acre of total land that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb one or more acres total land area. This permit may authorize discharges from other construction site activities that have been designated by the Agency as having the potential to adversely affect the water quality of waters of the state. This permit also authorizes discharges from construction sites previously approved by the Agency under the previous version of ILR10 that are still occurring after the effective date of this permit, except for discharges identified under Part I.B.3 (Limitations on Coverage). Where discharges from construction sites were initially covered under the previous version of the ILR10, the Storm Water Pollution Prevention Plan must be updated/revised as necessary to ensure compliance with the provision of this reissued ILR10 permit.
2. This permit may only authorize a storm water discharge associated with industrial activity from a construction site that is mixed with a storm water discharge from an industrial source other than construction, where:
  - a. the industrial source other than construction is located on the same site as the construction activity;
  - b. storm water discharges associated with industrial activity from the areas of the site where construction activities are occurring are in compliance with the terms of this permit; and
  - c. storm water discharges associated with industrial activity from the areas of the site where industrial activities other than construction are occurring (including storm water discharges from dedicated asphalt plants and dedicated concrete plants) are covered by a different NPDES general permit or an individual permit authorizing such discharges.

3. **Limitations on Coverage.** The following storm water discharges from construction sites are not authorized by this permit:
- storm water discharges associated with industrial activities that originate from the site after construction activities have been completed and the site has undergone final stabilization;
  - discharges that are mixed with sources of non-storm water other than discharges identified in Part III.A (Prohibition on Non-Storm Water Discharges) of this permit and in compliance with paragraph IV.D.5 (Non-Storm Water Discharges) of this permit;
  - storm water discharges associated with industrial activity that are subject to an existing NPDES individual or general permit or which are issued a permit in accordance with Part VI.N (Requiring an Individual Permit or an Alternative General Permit) of this permit. Such discharges may be authorized under this permit after an existing permit expires provided the existing permit did not establish numeric limitations for such discharges;
  - storm water discharges from construction sites that the Agency has determined to be or may reasonably be expected to be contributing to a violation of a water quality standard; and
  - storm water discharges that the Agency, at its discretion, determines are not appropriately authorized or controlled by this general permit.
  - storm water discharges to any receiving water specified under 35 Ill. Adm. Code 302.105(d) (6).

**C. Authorization.**

- In order for storm water discharges from construction sites to be authorized to discharge under this general permit a discharger must submit a Notice of Intent (NOI) in accordance with the requirements of Part II below, using an NOI form provided by the Agency.
- Where a new contractor is selected after the submittal of an NOI under Part II below, or where site ownership is transferred, a new Notice of Intent (NOI) must be submitted by the owner in accordance with Part II.
- Unless notified by the Agency to the contrary, dischargers who submit an NOI in accordance with the requirements of this permit are authorized to discharge storm water from construction sites under the terms and conditions of this permit in 30 days after the date the NOI is received by the Agency.
- The Agency may deny coverage under this permit and require submittal of an application for an individual NPDES permit based on a review of the NOI or other information.

**Part II. NOTICE OF INTENT REQUIREMENTS**

**A. Deadlines for Notification.**

- To receive authorization under this general permit, a discharger must submit a completed Notice of Intent (NOI) in accordance with Part VI.G (Signatory Requirements) and the requirements of this Part in sufficient time to allow a 30 day review period after the receipt of the NOI by the Agency and prior to the start of construction. The completed NOI may be submitted electronically to the following email address: [epa.constit10swppp@illinois.gov](mailto:epa.constit10swppp@illinois.gov)
- Discharges that were covered by the previous version of ILR10 are automatically covered by this permit. Where discharges associated with construction activities were initially covered under the previous version of ILR10 and are continuing, the Storm Water Pollution Prevention Plan must be updated/revised within 12 months of the effective date of this reissued permit, as necessary to ensure compliance with the provisions of the reissued ILR10. Updating of the SWPPP is not required if construction activities are completed and a Notice of Termination is submitted within 12 months of the effective date of this permit.
- A discharger may submit an NOI in accordance with the requirements of this Part after the start of construction. In such instances, the Agency may bring an enforcement action for any discharges of storm water associated with industrial activity from a construction site that have occurred on or after the start of construction.

- B. Failure to Notify.** Dischargers who fail to notify the Agency of their intent to be covered, and discharge storm water associated with construction site activity to Waters of the State without an NPDES permit are in violation of the Environmental Protection Act and Clean Water Act.

- C. Contents of Notice of Intent.** The Notice of Intent shall be signed in accordance with Part VI.G (Signatory Requirements) of this permit by all of the entities identified in paragraph 2 below and shall include the following information:

- The mailing address, and location of the construction site for which the notification is submitted. Where a mailing address for the site is not available, the location can be described in terms of the latitude and longitude of the approximate center of the facility to the nearest 15 seconds, or the nearest quarter section (if the section, township and range is provided) that the construction site is located in;
- The owner's name, address, telephone number, and status as Federal, State, private, public or other entity;
- The name, address and telephone number of the general contractor(s) that have been identified at the time of the NOI submittal;
- The name of the receiving water(s), or if the discharge is through a municipal separate storm sewer, the name of the municipal operator of the storm sewer and the ultimate receiving water(s);
- The number of any NPDES permits for any discharge (including non-storm water discharges) from the site that is currently authorized by an NPDES permit;

## NPDES Permit No. ILR10

6. A description of the project, detailing the complete scope of the project, estimated timetable for major activities and an estimate of the number of acres of the site on which soil will be disturbed;
7. For projects that have complied with State law on historic preservation and endangered species prior to submittal of the NOI, through coordination with the Illinois Historic Preservation Agency and the Illinois Department of Natural Resources or through fulfillment of the terms of interagency agreements with those agencies, the NOI shall indicate that such compliance has occurred.
8. An electronic copy of the storm water pollution prevention plan that has been prepared for the site in accordance with Part IV of this permit. The electronic copy shall be submitted to the Agency at the following email address: [epa.constilr10swppp@illinois.gov](mailto:epa.constilr10swppp@illinois.gov)
9. Revised notice of intents shall be submitted for any substantial modifications to the project such as: address changes, new contractors, area coverage, additional discharges to waters of the state, or other substantial modifications.

**D. Where to Submit.**

Construction activities which discharge storm water that requires a NPDES permit must use an NOI form provided by the Agency. The applicable fee shall also be submitted. NOIs must be signed in accordance with Part VI.G (Signatory Requirements) of this permit. The NOI form may be submitted to the Agency in any of the following methods:

1. File electronically with digital signature at the following website address: [http://dataservices.epa.illinois.gov/SWConstructionPermit/bowl\\_login.aspx](http://dataservices.epa.illinois.gov/SWConstructionPermit/bowl_login.aspx)  
Registration specific to the permittee is required in order to file electronically.
2. Submit complete NOI and SWPPP electronically to the following email address: [epa.constilr10swppp@illinois.gov](mailto:epa.constilr10swppp@illinois.gov). Submit the NOI with original signature and fee by certified mail to the Agency at the following address:

Illinois Environmental Protection Agency  
Division of Water Pollution Control, Mail Code #15  
Attention: Permit Section  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, Illinois 62794-9276

- E. Additional Notification.** Construction activities that are operating under approved local sediment and erosion plans, land disturbance permits, grading plans, or storm water management plans, in addition to filing copies of the Notice of Intent in accordance with Part D above, shall also submit signed copies of the Notice of Intent to the local agency approving such plans in accordance with the deadlines in Part A above. See Part IV.D.2.d (Approved State or Local Plans). A copy of the NOI shall be sent to the entity holding an active General NPDES Permit No. ILR40 if the permittee is located in an area covered by an active ILR40 permit.

- F. Notice of Termination.** Where a site has completed final stabilization and all storm water discharges from construction activities that are authorized by this permit are eliminated, the permittee must submit a completed Notice of Termination that is signed in accordance with Part VI.G (Signatory Requirements) of this permit.

1. The Notice of Termination shall include the following information:
  - a. The mailing address, and location of the construction site for which the notification is submitted. Where a mailing address for the site is not available, the location can be described in terms of the latitude and longitude of the approximate center of the facility to the nearest 15 seconds, or the nearest quarter section (if the section, township and range is provided) that the construction site is located in;
  - b. The owner's name, address, telephone number, and status as Federal, State, private, public or other entity;
  - c. The name, address and telephone number of the general contractor(s);
  - d. The date when construction was completed and the site was stabilized; and
  - e. The following certification signed in accordance with Part VI.G (Signatory Requirements) of this permit:

"I certify under penalty of law that all storm water discharges associated with construction site activity from the identified facility that are authorized by NPDES general permit ILR10 have otherwise been eliminated. I understand that by submitting this notice of termination, that I am no longer authorized to discharge storm water associated with construction site activity by the general permit, and that discharging pollutants in storm water associated with construction site activity to Waters of the State is unlawful under the Environmental Protection Act and Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this notice of termination does not release an operator from liability for any violations of this permit or the Clean Water Act."

For the purposes of this certification, elimination of storm water discharges associated with industrial activity means that all disturbed soils at the identified facility have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with construction activities from the identified site that are authorized by a NPDES general permit have otherwise been eliminated.

2. All Notices of Termination are to be sent to the Agency to the mailing address in Part II.D.1, using the form provided by the Agency, or electronically if the permittee submitted a Notice of Intent by electronic means.

**Part III. SPECIAL CONDITIONS, MANAGEMENT PRACTICES, AND OTHER  
NON-NUMERIC LIMITATIONS**

**A. Prohibition on Non-Storm Water Discharges.**

1. Except as provided in Part I paragraph B.2 and paragraphs 2, 3 or 4 below, all discharges covered by this permit shall be comprised entirely of storm water.
2. a. Except as provided in paragraph b below, discharges of materials other than storm water must be in compliance with a NPDES permit (other than this permit) issued for the discharge.
- b. The following non-storm water discharges may be authorized by this permit provided the non-storm water component of the discharges is in compliance with Part IV.D.5 (Non-Storm Water Discharges): discharges from fire fighting activities; fire hydrant flushings; waters used to wash vehicles where detergents are not used; waters used to control dust; potable water sources including uncontaminated waterline flushings; landscape irrigation drainages; routine external building washdown which does not use detergents; pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; uncontaminated air conditioning condensate; springs; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.
3. The following non-storm water discharges are prohibited by this permit: concrete and wastewater from washout of concrete (unless managed by an appropriate control), drywall compound, wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials, fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance, soaps, solvents, or detergents, toxic or hazardous substances from a spill or other release, or any other pollutant that could cause or tend to cause water pollution.
4. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are allowable if managed by appropriate controls.

**B. Discharges into Receiving Waters With an Approved Total Maximum Daily Load (TMDL):**

Discharges to waters for which there is a TMDL allocation for sediment or a parameter that addresses sediment (such as total suspended solids, turbidity, or siltation) are not eligible for coverage under this permit unless the owner/operator develops and certifies a SWPPP that is consistent with wasteload allocations in the approved TMDL. To be eligible for coverage under this general permit, operators must incorporate into their SWPPP any conditions and/or Best Management Practices applicable to their discharges necessary for consistency with the TMDL within any timeframes established in the TMDL. If a specific numeric waste load allocation has been established that would apply to the project's discharges, the operator must incorporate that allocation into its SWPPP and implement necessary steps to meet that allocation.

Please refer to the Agency website at: <http://www.epa.state.il.us/water/tmdl/report-status.html>

- C. Discharges covered by this permit, alone or in combination with other sources, shall not cause or contribute to a violation of any applicable water quality standard.

**Part IV. STORM WATER POLLUTION PREVENTION PLANS**

A storm water pollution prevention plan shall be developed for each construction site covered by this permit. Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges associated with construction site activity from the facility. In addition, the plan shall describe and ensure the implementation of best management practices which will be used to reduce the pollutants in storm water discharges associated with construction site activity and to assure compliance with the terms and conditions of this permit. The permittee must implement the provisions of the storm water pollution prevention plan required under this part as a condition of this permit.

**A. Deadlines for Plan Preparation and Compliance.**

The plan shall:

1. Be completed prior to the start of the construction activities to be covered under this permit and submitted electronically to the Agency at the time the Notice of Intent is submitted; and
2. Provide for compliance with the terms and schedules of the plan beginning with the initiation of construction activities.

**B. Signature, Plan Review and Notification.**

1. The plan shall be signed in accordance with Part VI.G (Signatory Requirements), and be retained at the construction site which generates the storm water discharge in accordance with Part VI.E (Duty to Provide Information) of this permit.
2. Prior to commencement of construction, the permittee shall provide the plan to the Agency.
3. The permittee shall make plans available upon request from this Agency or a local agency approving sediment and erosion plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system. A list of permitted municipal separate storm sewer systems is available at: <http://www.epa.state.il.us/water/permits/storm-water/ms4-status-report.pdf>
4. The Agency may notify the permittee at any time that the plan does not meet one or more of the minimum requirements of this Part. Such notification shall identify those provisions of the permit which are not being met by the plan, and identify which provisions of the plan require modifications in order to meet the minimum requirements of this part. Within 7 days from receipt of notification from the Agency, the permittee shall make the required changes to the plan and shall submit to the Agency a written certification that the requested changes have been made. Failure to comply shall terminate authorization



## NPDES Permit No. ILR10

under this permit.

5. A copy of the letter of notification of coverage along with the General NPDES Permit for Storm Water Discharges from Construction Site Activities or other indication that storm water discharges from the site are covered under an NPDES permit shall be posted at the site in a prominent place for public viewing (such as alongside a building permit).
  6. All storm water pollution prevention plans and all completed inspection forms/reports required under this permit are considered reports that shall be available to the public at any reasonable time upon request. However, the permittee may claim any portion of a storm water pollution prevention plan as confidential in accordance with 40 CFR Part 2.
- C. **Keeping Plans Current.** The permittee shall amend the plan whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to Waters of the State and which has not otherwise been addressed in the plan or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified under paragraph D.2 below, or in otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with construction site activity. In addition, the plan shall be amended to identify any new contractor and/or subcontractor that will implement a measure of the storm water pollution prevention plan. Amendments to the plan may be reviewed by the Agency in the same manner as Part IV.B above. Any revisions of the documents for the storm water pollution prevention plan shall be kept on site at all times.
- D. **Contents of Plan.** The storm water pollution prevention plan shall include the following items:
1. **Site Description.** Each plan shall provide a description of the following:
    - a. A description of the nature of the construction activity or demolition work;
    - b. A description of the intended sequence of major activities which disturb soils for major portions of the site (e.g. clearing, grubbing, excavation, grading, on-site or off-site stockpiling of soils, on-site or off-site storage of materials);
    - c. An estimate of the total area of the site and the total area of the site that is expected to be disturbed by clearing, grubbing, excavation, grading, on-site or off-site stockpiling of soils and storage of materials, or other activities;
    - d. An estimate of the runoff coefficient of the site after construction activities are completed and existing data describing the soil or the quality of any discharge from the site;
    - e. A site map indicating drainage patterns and approximate slopes anticipated before and after major grading activities, locations where vehicles enter or exit the site and controls to prevent offsite sediment tracking, areas of 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, locations of on-site or off-site soil stockpiling or material storage, surface waters (including wetlands), and locations where storm water is discharged to a surface water; and
    - f. The name of the receiving water(s) and the ultimate receiving water(s), and areal extent of wetland acreage at the site.
  2. **Controls.** Each plan shall include a description of appropriate controls that will be implemented at the construction site and any off-site stockpile or storage area. The Illinois Urban Manual [www.aiswcd.org/IUM](http://www.aiswcd.org/IUM) or other similar documents shall be used for developing the appropriate management practices, controls or revisions of the plan. The plan will clearly describe for each major activity identified in paragraph D.1 above, appropriate controls and the timing during the construction process that the controls will be implemented. For example, perimeter controls for one portion of the site will be installed after the clearing and grubbing necessary for installation of the measure, but before the clearing and grubbing for the remaining portions of the site. Perimeter controls will be actively maintained and/or repaired until final stabilization of those portions of the site upward of the perimeter control. Temporary perimeter controls will be removed after final stabilization. The description of controls shall address as appropriate the following minimum components:
    - a. **Erosion and Sediment Controls.** The permittee shall design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:
      - (i) Control storm water volume and velocity within the site to minimize soil erosion;
      - (ii) Control storm water discharges, including both peak flowrates and total storm water volume, to minimize erosion at outlets and to minimize downstream channel and streambank erosion;
      - (iii) Minimize the amount of soil exposed during construction activity;
      - (iv) Minimize the disturbance of steep slopes;
      - (v) Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting storm water runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
      - (vi) Provide and maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible; and
      - (vii) Minimize soil compaction and, unless infeasible, preserve topsoil.
    - b. **Stabilization Practices.** The storm water pollution prevention plan shall include a description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans should ensure that existing vegetation is preserved where practicable and that disturbed portions of the site are stabilized. Stabilization practices may include: temporarily seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, staged or staggered development, and other appropriate measures. A record of the dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated, shall be included in the plan. Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Stabilization of disturbed areas must be initiated within 1 working day of permanent or temporary cessation of earth disturbing activities and shall be completed as soon as possible but not later than 14 days from the initiation of stabilization work in an area. Exceptions to these time frames are specified as provided in paragraphs (i) and (ii) below:

- (i) Where the initiation of stabilization measures is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.
  - (ii) On areas where construction activity has temporarily ceased and will resume after 14 days, a temporary stabilization method can be used. Temporary stabilization techniques and materials shall be described in the SWPPP.
- c. **Structural Practices.** A description of structural practices utilized 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. Structural practices should be placed on upland soils to the degree practicable. The installation of these devices may be subject to Section 404 of the CWA.
- (i) The following design requirements apply to sediment basins if such structural practices will be installed to reduce sediment concentrations in storm water discharges:
    - a. When discharging from the sediment basin, utilize outlet structures that withdraw water from the surface in order to minimize the discharge.
    - b. Prevent erosion of the sediment basin using stabilization controls (e.g., erosion control blankets), at the inlet and outlet using erosion controls and velocity dissipation devices:
    - c. Sediment basins shall be designed to facilitate maintenance, including sediment removal from the basins, as necessary.
- d. **Use of Treatment Chemicals.** Identify the use of all polymer flocculants or treatment chemicals at the site. Dosage of treatment chemicals shall be identified along with any information from any Material Safety Data Sheet. Describe the location of all storage area for chemicals. Include any information from the manufacturer's specifications. Treatment chemicals must be stored in areas where they will not be exposed to precipitation. The SWPPP must describe procedures for use of treatment chemicals and staff responsible for use/application of treatment chemicals must be trained on the established procedures.
- e. **Best Management Practices for Impaired Waters.** For any site which discharges directly to an impaired water identified on the Agency's website for 303(d) listing for suspended solids, turbidity, or siltation the storm water pollution prevention plan shall be designed for a storm event equal to or greater than a 25-year 24-hour rainfall event. If required by federal regulations or the Illinois Urban Manual, the storm water pollution prevention plan shall adhere to a more restrictive design criteria. Please refer to the Agency's website at: (<http://www.epa.state.il.us/water/tmdl/303d-list.html>)
- f. **Pollution Prevention.** The permittee shall design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:
  - a. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
  - (ii) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to storm water; and
  - (iii) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.
- g. **Other Controls.**
- (i) **Waste Disposal.** No solid materials, including building materials, shall be discharged to Waters of the State, except as authorized by a Section 404 permit.
  - (ii) The plan shall ensure and demonstrate compliance with applicable State and/or local waste disposal, sanitary sewer or septic system regulations.
  - (iii) For construction sites that receive concrete or asphalt from off-site locations, the plan must identify and include appropriate controls and measures to reduce or eliminate discharges from these activities.
  - (iv) The plan shall include spill response procedures and provisions for reporting if there are releases in excess of reportable quantities.
- h. **Best Management Practices for Post-Construction Storm Water Management.** Describe the 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. Structural measures should be placed on upland soils to the degree attainable. The installation of these devices may be subject to Section 404 of the CWA. This permit only addresses the installation of storm water management measures, and not the ultimate operation and maintenance of such structures after the construction activities have been completed and the site has undergone final stabilization. Permittees are responsible for only the installation and maintenance of storm water management measures prior to final stabilization of the site, and are not responsible for maintenance after storm water discharges associated with industrial activity have been eliminated from the site.
- (i) While not mandatory, it is advisable that the permittee consider including in its storm water pollution prevention plan and design and construction plans methods of post-construction storm water management to retain the greatest amount of post-development stormwater runoff practicable, given the site and project constraints. Such practices may include but are not limited to: storm water detention structures (including wet ponds); storm water retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems (which combine several practices). Technical information on many post-construction storm water management practices is included in the Illinois Urban Manual (2012).
 

The storm water pollution prevention plan shall include an explanation of the technical basis used to select the practices to control pollution where post-construction flows will exceed predevelopment levels.
  - (ii) Velocity dissipation devices shall 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).

- (iii) Unless otherwise specified in the Illinois Urban Manual (2012), the storm water pollution prevention plan shall be designed for a storm event equal to or greater than a 25-year 24-hour rainfall event.

i. **Approved State or Local Plans.**

- (i) The management practices, controls and other provisions contained in the storm water pollution prevention plan must be at least as protective as the requirements contained in the Illinois Urban Manual, 2012. Construction activities which discharge storm water must include in their storm water pollution prevention plan procedures and requirements specified in applicable sediment and erosion control plans or storm water management plans approved by local officials. Requirements specified in sediment and erosion control 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 this permit, incorporated by reference and are enforceable under this permit. The plans shall include all requirements of this permit and include more stringent standards required by any local approval. This provision does not apply to provisions of master plans, comprehensive plans, non-enforceable guidelines or technical guidance documents that are not identified in a specific plan or permit that is issued for the construction site.
- (ii) Dischargers seeking alternative permit requirements are not authorized by this permit and shall submit an individual permit application in accordance with 40 CFR 122.26 at the address indicated in Part II.D (Where to Submit) of this permit, along with a description of why requirements in approved local plans or permits should not be applicable as a condition of an NPDES permit.

3. **Maintenance.**

- a. The plan shall include a description of procedures to maintain in good and effective operating conditions, all erosion and sediment control measures and other Best Management Practices, including vegetation and other protective measures identified in the Storm Water Pollution Prevention Plan.
- b. Where a basin has been installed to control sediment during construction activities, the Permittees shall keep the basin(s) in effective operating condition and remove accumulated sediment as necessary.

4. **Inspections.** Qualified personnel (provided by the permittee) shall inspect disturbed areas of the construction site that have not been finally stabilized, structural control measures, and locations where vehicles enter or exit the site at least once every seven calendar days and within 24 hours of the end of a storm or by the end of the following business or work day that is 0.5 inches or greater. Qualified personnel means a person knowledgeable in the principles and practices of erosion and sediment controls measures, such as a licensed Professional Engineer (P.E.), a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Erosion Sediment and Storm Water Inspector (CESSWI) or other knowledgeable person who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activities.

- a. Inspections may be reduced to once per month when construction activities have ceased due to frozen conditions. Weekly inspections will recommence when construction activities are conducted, or if there is 0.5" or greater rain event, or a discharge due to snowmelt occurs.
- b. 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 offsite sediment tracking.
- c. Based on the results of the inspection, the description of potential pollutant sources identified in the storm water pollution prevention plan in accordance with Part IV.D.1 (Site Description) of this permit and the pollution prevention control measures identified in the plan in accordance with Part IV.D.2 (Controls) of this permit shall be revised as appropriate as soon as practicable after such inspection to minimize the potential for such discharges. Such modifications shall provide for timely implementation of any changes to the plan and pollution prevention control measures within 7 calendar days following the inspection.
- d. 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 the storm water pollution prevention plan, and actions taken in accordance with paragraph b above shall be made and retained as part of the storm water pollution prevention plan for at least three years from the date that the permit coverage expires or is terminated. All inspection reports shall be retained at the construction site. The report shall be signed in accordance with Part VI.G (Signatory Requirements) of this permit.
- e. The permittee shall notify the appropriate Agency Field Operations Section office by email at: [epa\\_swnoncomp@illinois.gov](mailto:epa_swnoncomp@illinois.gov), telephone or fax within 24 hours of any incidence of noncompliance for any violation of the storm water pollution prevention plan observed during any inspection conducted, or for violations of any condition of this permit. The permittee shall complete and submit within 5 days an "Incidence of Noncompliance" (ION) report for any violation of the storm water pollution prevention plan observed during any inspection conducted, or for violations of any condition of this permit. Submission shall be on forms provided by the Agency and 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. Corrective actions must be undertaken immediately to address the identified non-compliance issue(s).
- f. All reports of noncompliance shall be signed by a responsible authority as defined in Part VI.G (Signatory Requirements).

- g. After the initial contact has been made with the appropriate Agency Field Operations Section Office, all reports of noncompliance shall be mailed to the Agency at the following address:

Illinois Environmental Protection Agency  
 Division of Water Pollution Control  
 Compliance Assurance Section  
 1021 North Grand Avenue 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 listed in Part III.A.2 of this permit that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and insure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.
- E. **Additional requirements for storm water discharges from industrial activities other than construction, including dedicated asphalt plants, and dedicated concrete plants.** This permit may only authorize any storm water discharge associated with industrial activity from a construction site that is mixed with a storm water discharge from an industrial source other than construction, where:
1. The industrial source other than construction is located on the same site as the construction activity;
  2. Storm water discharges associated with industrial activity from the areas of the site where construction activities are occurring are in compliance with the terms of this permit; and
  3. Storm water discharges associated with industrial activity from the areas of the site where industrial activity other than construction are occurring (including storm water discharges from dedicated asphalt plants [other than asphalt emulsion facilities] and dedicated concrete plants) are in compliance with the terms, including applicable NOI or application requirements, of a different NPDES general permit or individual permit authorizing such discharges.
- F. **Contractors.**
1. The storm water pollution prevention plan must clearly identify for each measure identified in the plan, the contractor(s) or subcontractor(s) that will implement the measure. All contractors and subcontractors identified in the plan must sign a copy of the certification statement in paragraph 2 below in accordance with Part VI.G (Signatory Requirements) of this permit. All certifications must be included in the storm water pollution prevention plan except for owners that are acting as contractors.
  2. **Certification Statement.** All contractors and subcontractors identified in a storm water pollution prevention plan in accordance with paragraph 1 above shall sign a copy of the following certification statement before conducting any professional service at the site identified in the storm water pollution prevention plan:

"I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit (ILR10) that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification."

The certification must include the name and title of the person providing the signature in accordance with Part VI.G of this permit: the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification is made.

#### Part V. RETENTION OF RECORDS

- A. The permittee shall retain copies of storm water pollution prevention plans and all reports and notices required by this permit, records of all data used to complete the Notice of Intent to be covered by this permit and the Agency Notice of Permit Coverage letter for a period of at least three years from the date that the permit coverage expires or is terminated. This period may be extended by request of the Agency at any time.
- B. The permittee shall retain a copy of the storm water pollution prevention plan and any revisions to said plan required by this permit at the construction site from the date of project initiation to the date of final stabilization.

#### Part VI. STANDARD PERMIT CONDITIONS

- A. **Duty to Comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Illinois Environmental Protection Act and the CWA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. Failure to obtain coverage under this permit or an individual permit for storm water releases associated with construction activities is a violation of the Illinois Environmental Protection Act and the CWA.
- B. **Continuation of the Expired General Permit.** This permit expires five years from the date of issuance. An expired general permit continues in force and effect until a new general permit or an individual permit is issued. Only those construction activities authorized to discharge under the expiring general permit are covered by the continued permit.
- C. **Need to halt or reduce activity not a defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- D. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

- E. Duty to Provide Information.** The permittee shall furnish within a reasonable time to the Agency or local agency approving sediment and erosion control plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the municipal operator of the system, any information which is requested to determine compliance with this permit. Upon request, the permittee shall also furnish to the Agency or local agency approving sediment and erosion control plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the municipal operator of the system, copies of all records required to be kept by this permit.
- F. Other Information.** When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Agency, he or she shall promptly submit such facts or information.
- G. Signatory Requirements.** All Notices of Intent, storm water pollution prevention plans, reports, certifications or information either submitted to the Agency or the operator of a large or medium municipal separate storm sewer system, or that this permit requires be maintained by the permittee, shall be signed.
1. All Notices of Intent shall be signed as follows:
    - a. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (1) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or (2) any person authorized to sign documents that has been assigned or delegated said authority in accordance with corporate procedures;
    - b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
    - c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.
  2. All reports required by the permit and other information requested by the Agency shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
    - a. The authorization is made in writing by a person described above and submitted to the Agency.
    - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).
    - c. **Changes to Authorization.** If an authorization under Part I.C (Authorization) is no longer accurate because a different individual or position has responsibility for the overall operation of the construction site, a new authorization satisfying the requirements of Part I.C must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.
    - d. **Certification.** Any person signing documents under this Part shall make the following certification:
 

"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."
- H. Penalties for Falsification of Reports.** Section 309(c)(4) of the Clean Water Act provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than 2 years, or by both. Section 44(j)(4) and (5) of the Environmental Protection Act provides that any person who knowingly makes any false statement, representation, or certification in an application form, or form pertaining to a NPDES permit commits a Class A misdemeanor, and in addition to any other penalties provided by law is subject to a fine not to exceed \$10,000 for each day of violation.
- I. Penalties for Falsification of Monitoring Systems.** The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by fines and imprisonment described in Section 309 of the CWA. The Environmental Protection Act provides that any person who knowingly renders inaccurate any monitoring device or record required in connection with any NPDES permit or with any discharge which is subject to the provisions of subsection (f) of Section 12 of the Act commits a Class A misdemeanor, and in addition to any other penalties provided by law is subject to a fine not to exceed \$10,000 for each day of violation.
- J. Oil and Hazardous Substance Liability.** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under section 311 of the CWA.
- K. Property Rights.** The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.
- L. Severability.** The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.
- M. Transfers.** This permit is not transferable to any person except after notice to the Agency. The Agency may require the discharger to apply for and obtain an individual NPDES permit as stated in Part I.C (Authorization).
- N. Requiring an Individual Permit or an Alternative General Permit.**

1. The Agency may require any person authorized by this permit to apply for and/or obtain either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition the Agency to take action under this paragraph. Where the Agency requires a discharger authorized to discharge under this permit to apply for an individual NPDES permit, the Agency shall notify the discharger in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the discharger to file the application, and a statement that on the effective date of the individual NPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. Applications shall be submitted to the Agency indicated in Part II.D (Where to Submit) of this permit. The Agency may grant additional time to submit the application upon request of the applicant. If a discharger fails to submit in a timely manner an individual NPDES permit application as required by the Agency under this paragraph, then the applicability of this permit to the individual NPDES permittee is automatically terminated at the end of the day specified by the Agency for application submittal. The Agency may require an individual NPDES permit based on:
    - a. information received which indicates the receiving water may be of particular biological significance pursuant to 35 Ill. Adm. Code 302.105(d)(6);
    - b. whether the receiving waters are impaired waters for suspended solids, turbidity or siltation as identified by the Agency's 303(d) listing;
    - c. size of construction site, proximity of site to the receiving stream, etc.

The Agency may also require monitoring of any storm water discharge from any site to determine whether an individual permit is required.
  2. Any discharger authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. In such cases, the permittee shall submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii), with reasons supporting the request, to the Agency at the address indicated in Part II.D (Where to Submit) of this permit. The request may be granted by issuance of any individual permit or an alternative general permit if the reasons cited by the permittee are adequate to support the request.
  3. When an individual NPDES permit is issued to a discharger otherwise subject to this permit, or the discharger is authorized to discharge under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual NPDES permit is denied to a discharger otherwise subject to this permit or the discharger is denied for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee remains in effect, unless otherwise specified by the Agency.
- O. **State/Environmental Laws.** No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.
- P. **Proper Operation and Maintenance.** The permittee shall at all times properly operate and maintain all construction activities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.
- Q. **Inspection and Entry.** The permittee shall allow the IEPA, or an authorized representative upon presentation of credentials and other documents as may be required by law, to:
  1. Enter upon the permittee's premises where a regulated construction activity is located or conducted, or where records must be kept under the conditions of this permit;
  2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit;
  3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
  4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.
- R. **Permit Actions.** This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
- S. **Bypasses and Upsets.** The provisions of 40 CFR Section 122.41(m) & (n) are applicable and are hereby incorporated by reference.

#### Part VII. REOPENER CLAUSE

- A. If there is evidence indicating potential or realized impacts on water quality due to any storm water discharge associated with industrial activity covered by this permit, the discharger may be required to obtain an individual permit or an alternative general permit in accordance with Part I.C (Authorization) of this permit or the permit may be modified to include different limitations and/or requirements.
- B. Permit modification or revocation will be conducted according to provisions of 35 Ill. Adm. Code, Subtitle C, Chapter I and the provisions of 40 CFR 122.62, 122.63, 122.64 and 124.5 and any other applicable public participation procedures.
- C. The Agency will reopen and modify this permit under the following circumstances:
  1. the U.S. EPA amends its regulations concerning public participation;
  2. a court of competent jurisdiction binding in the State of Illinois or the 7<sup>th</sup> Circuit Court of Appeals issues an order necessitating a modification of public participation for general permits; or
  3. to incorporate federally required modifications to the substantive requirements of this permit.

## Part VIII. DEFINITIONS

"Agency" means the Illinois Environmental Protection Agency.

"Best Management Practices" ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control construction site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Commencement of Construction or Demolition Activities" The initial disturbance of soils associated with clearing, grading, or excavating activities or other construction or demolition activities.

"Construction Activities" Earth disturbing activities, such as clearing, grading and excavation of land. For purposes of this permit, construction activities also means construction site, construction site activities, or site. Construction activities also include any demolition activities at a site.

"CWA" means Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. (96-483 and Pub. L. 97-117, 33 U.S.C. 1251 et seq.).

"Dedicated portable asphalt plant" A portable asphalt plant that is located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR 443.

"Dedicated portable concrete plant" A portable concrete plant that is located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

"Dedicated sand or gravel operation" An operation that produces sand and/or gravel for a single construction project.

"Director" means the Director of the Illinois Environmental Protection Agency or an authorized representative.

"Final Stabilization" means that all soil disturbing activities at the site have been completed, and either of the two following conditions are met:

- (i) A uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or
- (ii) Equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

For individual lots in residential construction, final stabilization means that either:

- (i) The homebuilder has completed final stabilization as specified above, or
- (ii) The homebuilder has established temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and informing the homeowner of the need for, and benefits of, final stabilization.

"Large and Medium municipal separate storm sewer system" means all municipal separate storm sewers that are either:

- (i) Located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 CFR Part 122); or
- (ii) Located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties (these counties are listed in Appendices H and I of 40 CFR Part 122); or
- (iii) Owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the Director as part of the large or medium municipal separate storm sewer system.

"NOI" means notice of intent to be covered by this permit (see Part II of this permit.)

"Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

"Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff.

"Storm Water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

"Storm Water Associated with Industrial Activity" means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified in subparagraphs (i) through (x) of this subsection, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in subparagraph (xi), the term includes only storm water discharges from all areas listed in the previous

sentence (except access roads) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally or municipally owned or operated that meet the description of the facilities listed in this paragraph (i)-(xi)) include those facilities designated under 40 CFR 122.26(a)(1)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

- (i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi) of this paragraph);
- (ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28, 29, 311, 32, 33, 3441, 373;
- (iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations meeting the definition of a reclamation area under 40 CFR 434.11(l)) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator;
- (iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;
- (v) Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;
- (vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093;
- (vii) Steam electric power generating facilities, including coal handling sites;
- (viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42, 44, and 45 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under subparagraphs (i)-(vii) or (ix)-(xi) of this subsection are associated with industrial activity;
- (ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR 503;
- (x) Construction activity including clearing, grading and excavation activities except: operations that result in the disturbance of less than one acre of total land area which are not part of a larger common plan of development or sale unless otherwise designated by the Agency pursuant to Part I.B.1.
- (xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 31 (except 311), 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (i)-(x)).

"Waters" mean all accumulations of water, surface and underground, natural, and artificial, public and private, or parts thereof, which are wholly or partially within, flow through, or border upon the State of Illinois, except that sewers and treatment works are not included except as specially mentioned; provided, that nothing herein contained shall authorize the use of natural or otherwise protected waters as sewers or treatment works except that in-stream aeration under Agency permit is allowable.

"Work day" for the purpose of this permit, a work day is any calendar day on which construction activities will take place.

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Route FAU 187  
Section 11-00121-10-BR  
County Lake

Marked Rte. Washington Street  
Project No. \_\_\_\_\_  
Contract No. \_\_\_\_\_

This plan has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10 (Permit ILR10), issued by the Illinois Environmental Protection Agency (IEPA) for storm water discharges from construction site activities.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Todd S. Bright  
Print Name  
Project Manager  
Title  
Lake County Department of Transportation  
Agency

*Todd S. Bright*  
Signature  
7/17/14  
Date

**I. Site Description:**

A. Provide a description of the project location (include latitude and longitude):

Lake County Division of Transportation is widening and reconstructing Washington Street (FAU 187) through the Village of Grayslake and portions of unincorporated Lake County. The improvements span from Haryan Way to North Lake Street, about 0.4 miles in length. The approximate latitude and longitude are (42.3571,-88.0461).

B. Provide a description of the construction activity which is the subject of this plan:

Construction activity will include constructing a railroad grade seperation, adding additional through lanes with a bi-directional left turn lane in the middle, curb and gutter, a closed drainage system with swales in the parkway, and a stormwater pumping station. The project also includes grading for a new 2 acre detention basin and the expansion of an existing detention basin. Additionally, a 10 foot multi-use path will also be maintained and extended.

C. Provide the estimated duration of this project:

2.5 Years

D. The total area of the construction site is estimated to be 14.3 acres.

The total area of the site estimated to be disturbed by excavation, grading or other activities is 14.3 acres.

E. The following is a weighted average of the runoff coefficient for this project after construction activities are completed:

Before Construction: 0.41

After Construction: 0.46

F. List all soils found within project boundaries. Include map unit name, slope information, and erosivity:

The predominant soil types found on site according to the USDA Soil Survey are Wauconda, Grays and Markham, and Barrington and Varna silt loams. An NRCS soils report is attached. The erosion potential for these soils is low.

G. Provide an aerial extent of wetland acreage at the site:

0.162 acres

H. Provide a description of potentially erosive areas associated with this project:

The grading being done in the detention basins is sensitive to erosion and will be protected by perimeter erosion barrier. Also, any wetland area impacted by the construction has a higher potential for soil washout and should be paid special attention to during construction.

I. The following is a description of soil disturbing activities by stages, their locations, and their erosive factors (e.g. steepness of slopes, length of slopes, etc):

Removal of existing storm sewer - various locations along the length of the project

Roadway grading - Along the entire length of the proposed roadway.

Detention basin grading - The south east corner of Washington Street and Haryan Way there is grading being done to increase volume, slopes will be 6:1. The detention pond located north of Washington Street and just west of North Lake Street, slopes will be 4:1.

J. See the erosion control plans and/or drainage plans for this contract for information regarding drainage patterns, approximate slopes anticipated before and after major grading activities, locations where vehicles enter or exit the site and controls to prevent offsite sediment tracking (to be added after contractor identifies locations), areas of soil disturbance, the location of major structural and non-structural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands) and locations where storm water is discharged to surface water including wetlands.

K. Identify who owns the drainage system (municipality or agency) this project will drain into:

Village of Grayslake

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

An unnamed tributary to Mill Creek

M. The following is a list of receiving water(s) and the ultimate receiving water(s) for this site. The location of the receiving waters can be found on the erosion and sediment control plans:

An unnamed tributary to Mill Creek

N. Describe areas of the site that are to be protected or remain undisturbed. These areas may include steep slopes, highly erodible soils, streams, stream buffers, specimen trees, natural vegetation, nature preserves, etc.

High and low quality wetlands, FEMA floodplain east of Haryan Way west of Lowlands Drive.

O. The following sensitive environmental resources are associated with this project, and may have the potential to be impacted by the proposed development:

- Floodplain
- Wetland Riparian
- Threatened and Endangered Species
- Historic Preservation
- 303(d) Listed receiving waters for suspended solids, turbidity, or siltation
- Receiving waters with Total Maximum Daily Load (TMDL) for sediment, total suspended solids, turbidity or siltation
- Applicable Federal, Tribal, State or Local Programs
- Other

1. 303(d) Listed receiving waters (fill out this section if checked above):

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

- b. Provide a description of how erosion and sediment control practices will prevent a discharge of sediment resulting from a storm event equal to or greater than a twenty-five (25) year, twenty-four (24) hour rainfall event:
  - c. Provide a description of the location(s) of direct discharge from the project site to the 303(d) water body:
  - d. Provide a description of the location(s) of any dewatering discharges to the MS4 and/or water body:
2. TMDL (fill out this section if checked above)
- a. The name(s) of the listed water body:
  - b. Provide a description of the erosion and sediment control strategy that will be incorporated into the site design that is consistent with the assumptions and requirements of the TMDL:
  - c. If a specific numeric waste load allocation has been established that would apply to the project's discharges, provide a description of the necessary steps to meet that allocation:

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

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

**II. Controls:**

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

- A. **Erosion and Sediment Controls:** At a minimum, controls must be coordinated, installed and maintained to:
1. Minimize the amount of soil exposed during construction activity;
  2. Minimize the disturbance of steep slopes;
  3. Maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible;
  4. Minimize soil compaction and, unless infeasible, preserve topsoil.

B. **Stabilization Practices:** Provided below is a description of interim and permanent stabilization practices, including site- specific scheduling of the implementation of the practices. Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized. Stabilization practices may include but are not limited to: temporary seeding, permanent seeding, mulching, geotextiles, sodding, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Except as provided below in II(B)(1) and II(B)(2), stabilization measures shall be initiated **immediately** where construction activities have temporarily or permanently ceased, but in no case more than **one (1) day** after the construction activity in that portion of the site has temporarily or permanently ceases on all disturbed portions of the site where construction will not occur for a period of fourteen (14) or more calendar days.

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

The following stabilization practices will be used for this project:

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

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

1. Preservation of Mature Vegetation - Areas of existing vegetation on and adjacent to the right of way shall be protected from disturbance and accidental intrusions of construction equipment and personnel.
2. Vegetated Buffer Strips - Utilized in areas adjacent to wetlands. Buffer strips will be placed around wetland areas for a distance of 100 feet.
3. Temporary Erosion Control Seeding - Utilized on all temporary seeding areas. Applied to all bare areas every seven days to minimize the amount of exposed surface area.
4. Temporary Mulching - Placement of straw in all seeding areas just after planting to reduce erosion

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

5. Permanent Seeding - All disturbed soils within the construction zone will be permanently stabilized with either sodding or with Permanent Seeding and Erosion Control Blanket as soon as the area is at final grade.
6. Erosion Control Blanket - Used in conjunction with permanent seeding and at the detention basins
7. Sodding - utilized adjacent to residential lots to permanently stabilize disturbed areas.

C. **Structural Practices:** Provided below is a description of structural practices that will be implemented, to the degree attainable, to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Such practices may include but are not limited to: perimeter erosion barrier, earth dikes, drainage swales, sediment traps, ditch checks, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. The installation of these devices may be subject to Section 404 of the Clean Water Act.

The following structural practices will be used for this project:

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Perimeter Erosion Barrier     | <input type="checkbox"/> Rock Outlet Protection     |
| <input checked="" type="checkbox"/> Temporary Ditch Check         | <input checked="" type="checkbox"/> Riprap          |
| <input checked="" type="checkbox"/> Storm Drain Inlet Protection  | <input type="checkbox"/> Gabions                    |
| <input checked="" type="checkbox"/> Sediment Trap                 | <input type="checkbox"/> Slope Mattress             |
| <input type="checkbox"/> Temporary Pipe Slope Drain               | <input checked="" type="checkbox"/> Retaining Walls |
| <input type="checkbox"/> Temporary Sediment Basin                 | <input type="checkbox"/> Slope Walls                |
| <input type="checkbox"/> Temporary Stream Crossing                | <input type="checkbox"/> Concrete Revetment Mats    |
| <input checked="" type="checkbox"/> Stabilized Construction Exits | <input type="checkbox"/> Level Spreaders            |

- |   |   |
|---|---|
| <input type="checkbox"/> Turf Reinforcement Mats  | <input checked="" type="checkbox"/> Other (specify) Erosion Control Mat |
| <input type="checkbox"/> Permanent Check Dams     | <input checked="" type="checkbox"/> Other (specify) Flocculation Logs   |
| <input type="checkbox"/> Permanent Sediment Basin | <input checked="" type="checkbox"/> Other (specify) Flocculation Powder |
| <input type="checkbox"/> Aggregate Ditch          | <input type="checkbox"/> Other (specify)                                |
| <input type="checkbox"/> Paved Ditch              | <input type="checkbox"/> Other (specify)                                |

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

1. Perimeter Erosion Barrier - A silt filter fence will be placed on the perimeter of the construction area to intercept waterborne silt and prevent it from leaving the site.
2. Temporary Ditch Check - Urethane foam/geotextile ditch checks shall be used in swales and ditches where the runoff velocity is greater than 3 fps or as directed by the Engineer in order to prevent downstream erosion.
3. Storm Drain Inlet Protection - Inlet and pipe protection will be provided for storm sewers and culverts. Inlet Inlet Sediment Filters will be placed in all inlets, catch basins, and open lid manholes during construction and will be cleaned on a regular basis.
4. Sediment Trap - Will be utilized at the in basin 2 prior to the outlet to prevent sediment from polluting Mill Creek. The sediment trapped will be disposed of as appropriate.
6. Stabilized Construction Exits - Provided at designated entrance/exit points for construction vehicles to reduce the amount of soil transferred to public roads. The Stabilized Construction Exit is a combination of aggregate, silt fence, sediment barrier, and a sediment trapping device. The sediment trapped will be disposed of as appropriate. Practices used on this project are covered in chapter 59 of the Illinois Department of Transportation Bureau of Design and Environment Manual.
7. Erosion Control Mat, Flocculation Logs and Flocculation Powder - will be utilized in ditch bottoms to precipitate out suspended solids (silt).

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

Riprap - Used at outlets of proposed culverts to dissipate energy and reduce velocities.

Retaining Walls - will be constructed along the south side of Washington Street through the grade separation to permanently stabilize the grade difference.

#### D. Treatment Chemicals

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

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

E. **Permanent Storm Water Management Controls:** Provided below is a description of measures that will be installed during the construction process to control volume and pollutants in storm water discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404 of the Clean Water Act.

1. Such practices may include but are not limited to: storm water detention structures (including wet ponds), storm water retention structures, flow attenuation by use of open vegetated swales and natural depressions, infiltration of runoff on site, and sequential systems (which combine several practices).

The practices selected for implementation were determined on the basis of the technical guidance in Chapter 41 (Construction Site Storm Water Pollution Control) of the IDOT Bureau of Design and Environment Manual. If practices other than those discussed in Chapter 41 are selected for implementation or if practices are applied to situations different from those covered in Chapter 41, the technical basis for such decisions will be explained below.

2. Velocity dissipation devices will be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g. maintenance of hydrologic conditions such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

Description of permanent storm water management controls:

Practices used on this project are covered in chapter 59 of the Illinois Department of Transportation Bureau of Design and Environment Manual. Wet basins and oversized sewers will provide detention and some water quality treatment, while water quality treatment structures are being utilized to treat water in two major pipe runs.

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

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

All management practices, controls, and other provisions provided in this plan are in accordance with the IDOT Standard Specifications for Road and Bridge Construction adopted January 1, 2012, and the Illinois Urban Manual updated January, 2012. The road improvements and plans have also been approved by the Lake County Stormwater Management Commission.

- G. **Contractor Required Submittals:** Prior to conducting any professional services at the site covered by this plan, the Contractor and each subcontractor responsible for compliance with the permit shall submit to the Resident Engineer a Contractor Certification Statement, BDE 2342a.
1. The Contractor shall provide a construction schedule containing an adequate level of detail to show major activities with implementation of pollution prevention BMPs, including the following items:
    - Approximate duration of the project, including each stage of the project
    - Rainy season, dry season, and winter shutdown dates
    - Temporary stabilization measures to be employed by contract phases
    - Mobilization timeframe
    - Mass clearing and grubbing/roadside clearing dates
    - Deployment of Erosion Control Practices
    - Deployment of Sediment Control Practices (including stabilized construction entrances/exits)
    - Deployment of Construction Site Management Practices (including concrete washout facilities, chemical storage, refueling locations, etc.)
    - Paving, saw-cutting, and any other pavement related operations
    - Major planned stockpiling operations
    - Timeframe for other significant long-term operations or activities that may plan non-storm water discharges such as dewatering, grinding, etc.
    - Permanent stabilization activities for each area of the project
  2. The Contractor and each subcontractor shall provide, as an attachment to their signed Contractor Certification Statement, a discussion of how they will comply with the requirements of the permit in regard to the following items and provide a graphical representation showing location and type of BMPs to be used when applicable:

- Vehicle Entrances and Exits – Identify type and location of stabilized construction entrances and exits to be used and how they will be maintained.
- Material Delivery, Storage and Use – Discuss where and how materials including chemicals, concrete curing compounds, petroleum products, etc. will be stored for this project.
- Stockpile Management – Identify the location of both on-site and off-site stockpiles. Discuss what BMPs will be used to prevent pollution of storm water from stockpiles.
- Waste Disposal – Discuss methods of waste disposal that will be used for this project.
- Spill Prevention and Control – Discuss steps that will be taken in the event of a material spill (chemicals, concrete curing compounds, petroleum, etc.)
- Concrete Residuals and Washout Wastes – Discuss the location and type of concrete washout facilities to be used on this project and how they will be signed and maintained.
- Litter Management – Discuss how litter will be maintained for this project (education of employees, number of dumpsters, frequency of dumpster pick-up, etc.)
- Vehicle and Equipment Fueling – Identify equipment fueling locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Vehicle and Equipment Cleaning and Maintenance – Identify where equipment cleaning and maintenance locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Dewatering Activities – Identify the controls which will be used during dewatering operations to ensure sediments will not leave the construction site.
- Polymer Flocculants and Treatment Chemicals – Identify the use and dosage of treatment chemicals and provide the Resident Engineer with Material Safety Data Sheets. Describe procedures on how the chemicals will be used and identify who will be responsible for the use and application of these chemicals. The selected individual must be trained on the established procedures.
- Additional measures indicated in the plan.

### III. Maintenance:

When requested by the Contractor, the Resident Engineer will provide general maintenance guides to the Contractor for the practices associated with this project. The following additional procedures will be used to maintain, in good and effective operating conditions, the vegetation, erosion and sediment control measures and other protective measures identified in this plan. It will be the Contractor's responsibility to attain maintenance guidelines for any manufactured BMPs which are to be installed and maintained per manufacture's specifications.

All maintenance of erosion control systems will be the responsibility of the contractor. All locations where vehicles enter or exit the construction site and all other areas subject to erosion should also be inspected periodically.

### IV. Inspections:

Qualified personnel shall inspect disturbed areas of the construction site which have not yet been finally stabilized, structural control measures, and locations where vehicles and equipment enter and exit the site using IDOT Storm Water Pollution Prevention Plan Erosion Control Inspection Report (BC 2259). Such inspections shall be conducted at least once every seven (7) calendar days and within twenty-four (24) hours of the end of a storm or by the end of the following business or work day that is 0.5 inch or greater or equivalent snowfall.

Inspections may be reduced to once per month when construction activities have ceased due to frozen conditions. Weekly inspections will recommence when construction activities are conducted, or if there is 0.5" or greater rain event, or a discharge due to snowmelt occurs.

If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer shall notify the appropriate IEPA Field Operations Section office by email at: [epa.swnoncomp@illinois.gov](mailto:epa.swnoncomp@illinois.gov), telephone or fax within twenty-four (24) hours of the incident. The Resident Engineer shall then complete and submit an "Incidence of Non-Compliance" (ION) report for the identified violation within five (5) days of the incident. The Resident Engineer shall use forms provided by IEPA and shall include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. All reports of non-compliance shall be signed by a responsible authority in accordance with Part VI. G of the Permit ILR10.

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

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

Additional Inspections Required:

**V. Failure to Comply:**

Failure to comply with any provisions of this Storm Water Pollution Prevention Plan will result in the implementation of a National Pollutant Discharge Elimination System/Erosion and Sediment Control Deficiency Deduction against the Contractor and/or penalties under the Permit ILR10 which could be passed on to the Contractor.





Contractor Certification Statement

Prior to conducting any professional services at the site covered by this contract, the Contractor and every subcontractor must complete and return to the Resident Engineer the following certification. A separate certification must be submitted by each firm. Attach to this certification all items required by Section II.G of the Storm Water Pollution Prevention Plan (SWPPP) which will be handled by the Contractor/subcontractor completing this form.

Route FAU 187 Marked Rte. Washington Street
Section 11-00121-10-BR Project No.
County Lake Contract No.

This certification statement is a part of SWPPP for the project described above, in accordance with the General NPDES Permit No. ILR10 issued by the Illinois Environmental Protection Agency.

I certify under penalty of law that I understand the terms of the Permit No. ILR 10 that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

In addition, I have read and understand all of the information and requirements stated in SWPPP for the above mentioned project; I have received copies of all appropriate maintenance procedures; and, I have provided all documentation required to be in compliance with the Permit ILR10 and SWPPP and will provide timely updates to these documents as necessary.

- Contractor
Sub-Contractor

Print Name Signature
Title Date
Name of Firm Telephone
Street Address City/State/ZIP

Items which this Contractor/subcontractor will be responsible for as required in Section II.G. of SWPPP:



STORMWATER MANAGEMENT COMMISSION

**WATERSHED DEVELOPMENT PERMIT NUMBER  
Permit #C12-83-020  
HAS BEEN SECURED**

**Project: Washington Street Improvements  
Hainesville Road to Lake Street**

**Date Issued:** August 6, 2014

**Lat/Long:** 42.35705, -88.06801

**PIN No.:** 0621417021

**Conditions:** • Install and maintain all SE/SC measures  
• Minimize environmental impacts

**Issued By:** Robert D. Gardiner, PE, CFM  
Permit Engineer

Kurt A. Woolford, PE, CFM, LEED AP  
Chief Engineer

## **Notice to Contractors and Owners**

**Post this card at the site, visible from the street and so located as to permit the inspector to record the indicated inspections on the placard. Do not post in the interior of a building.**

**Inspectors and sheriff's deputies are instructed to stop all work where this permit card is not displayed.**

**Always mention the Watershed Development Permit number when referring to this project. If this card becomes mislaid or lost please contact Lake County Stormwater Management Commission for a replacement.**

**Lake County Stormwater Management Commission (847) 377-7705**

WATERSHED DEVELOPMENT PERMIT APPLICATION

Revised 10/2012

Office Use	1. COMMUNITY AND STATUS	2. Map Number (office use only)	3. STORMWATER APP. PERMIT # <b>12 83 020</b>	4. COMMUNITY APP. NO. (to be assigned by community)
	Standard Conditional Certified Non-Certified	Isolated Wetlands Conditional Certified Non-Certified		
5. NAME & ADDRESS OF PROPERTY OWNER		6. NAME & ADDRESS OF ENGINEER/AGENT		7. NAME & ADDRESS OF CERT. WETLAND SPECIALIST
Mr. Todd Bright on Behalf of Lake County Division of Transportation Transystems 1475 East Woodfield Road, Suite 600 Schaumburg, IL 60173-5440 Daytime Phone: 847-407-6271 Fax: 847-606-9610 Email: tsbright@transystems.com		Mr. Christopher Heiland Patrick Engineering 55 East Monroe, Suite 3450 Chicago, IL 60603 Daytime Phone: 312-201-7594 Fax: 312-220-0722 Email: cheiland@patrickco.com		Ms. Lailah Reich Huff & Huff, Inc. 916 Harger Road, Suite 330 Oak Brook, Illinois 60523 Daytime Phone: 630-684-4415 Fax: 630-684-9120 Email: lreich@huffhuff.com

<p><b>8A. CHECK THE ONE CONDITION THAT APPLIES:</b></p> <input type="checkbox"/> Exempt Watershed Development Permit Not Required (IV.A.2) <input type="checkbox"/> Minor Development (IV.A., IV.B.) <input type="checkbox"/> Major Development Outside the Floodplain (IV.A., IV.B., IV.C., IV.G.) <input checked="" type="checkbox"/> Major Development Inside the Floodplain (IV.A., IV.B., IV.C., IV.D., IV.G.) <input checked="" type="checkbox"/> Public Road Development (IV.A., IV.F.) <input type="checkbox"/> Public Development in the Floodplain (Appendix E.1.2.) <input type="checkbox"/> Existing Conditions BFE Only (no development) <input type="checkbox"/> Soil Erosion and Sediment Control Review Only	<p><b>8B. CHECK ALL CONDITIONS THAT APPLY:</b></p> <input type="checkbox"/> Isolated Wetland Impact (IV.E.) <input type="checkbox"/> Request Letter of No Wetland Impact (LONI) (IV.E.) <input type="checkbox"/> Development in a Floodway (IV.C.3.) <input type="checkbox"/> Floodplain Map Revision or Amendment (IV.C.2.g.; IV.C.3.d.(ii)) <input checked="" type="checkbox"/> Watercourse w/Drainage Area >20 Acres and <100 Acres (IV.A., IV.D.) <input type="checkbox"/> Watercourse w/Drainage Area >100 Acres and <640 Acres (IV.A., IV.D.) <input type="checkbox"/> Earth Change Approval (ECA) (IV.A.4.b.) <input type="checkbox"/> Variance Request (V.) <input type="checkbox"/> BFE or Floodway Determination (IV.C.) <input type="checkbox"/> Designated Erosion Control Inspector (DECI) Required <input type="checkbox"/> Pre-application Meeting Held <input checked="" type="checkbox"/> Hydrologically Disturbs 5000 sq. ft. or More
---	--

<p><b>9A. STORMWATER DATA SUMMARY</b></p> <table border="1"> <thead> <tr> <th></th> <th>Unit</th> </tr> </thead> <tbody> <tr><td>Total Property Ownership</td><td>= 36.4 Acres</td></tr> <tr><td>Hydrologic Disturbance</td><td>= 32 Acres</td></tr> <tr><td>Watershed Area Tributary to Development</td><td>= 38.76 Acres</td></tr> <tr><td>Proposed Impervious Area</td><td>= 16.43 Acres</td></tr> <tr><td>Existing Impervious Area Pre-1992</td><td>= Acres</td></tr> <tr><td>Existing Impervious Area Post-1992</td><td>= 10.00 Acres</td></tr> <tr><td>Detention Volume Required</td><td>= 5.023 Acre-ft</td></tr> <tr><td>Compensatory Storage Required</td><td>= 0.182 Acre-ft</td></tr> <tr><td>Depressional</td><td>= 0.159 Acre-ft</td></tr> <tr><td>Riverine 0- to 10-Year</td><td>= 0.605 Acre-ft</td></tr> <tr><td>Riverine 10- to 100-Year</td><td>= 0.018 Acre-ft</td></tr> </tbody> </table>			Unit	Total Property Ownership	= 36.4 Acres	Hydrologic Disturbance	= 32 Acres	Watershed Area Tributary to Development	= 38.76 Acres	Proposed Impervious Area	= 16.43 Acres	Existing Impervious Area Pre-1992	= Acres	Existing Impervious Area Post-1992	= 10.00 Acres	Detention Volume Required	= 5.023 Acre-ft	Compensatory Storage Required	= 0.182 Acre-ft	Depressional	= 0.159 Acre-ft	Riverine 0- to 10-Year	= 0.605 Acre-ft	Riverine 10- to 100-Year	= 0.018 Acre-ft	<p><b>9B. WETLAND DATA SUMMARY</b></p> <table border="1"> <tbody> <tr><td>Existing Wetland Acreage</td><td>= 3.378</td></tr> <tr><td>Waters of the U.S.</td><td>=</td></tr> <tr><td>Isolated Waters of Lake County</td><td>=</td></tr> <tr><td>Impacted Wetland Acreage</td><td>= 0.480</td></tr> <tr><td>Waters of the U.S.</td><td>= 0.243</td></tr> <tr><td>Isolated Waters of Lake County</td><td>= 0.237</td></tr> <tr><td>Mitigation Replacement Ratio</td><td>= 1.5:1</td></tr> <tr><td>Mitigation Acreage Required</td><td>= 0.720</td></tr> <tr><td>Waters of the U.S.</td><td>= 0.365</td></tr> <tr><td>Isolated Waters of Lake County</td><td>= 0.356</td></tr> <tr><td>On-Site</td><td>=</td></tr> <tr><td>Off-Site</td><td>=</td></tr> <tr><td>Mitigation Bank</td><td>= 0.720</td></tr> <tr><td>SMC Wetland Restoration Fund</td><td>=</td></tr> </tbody> </table>		Existing Wetland Acreage	= 3.378	Waters of the U.S.	=	Isolated Waters of Lake County	=	Impacted Wetland Acreage	= 0.480	Waters of the U.S.	= 0.243	Isolated Waters of Lake County	= 0.237	Mitigation Replacement Ratio	= 1.5:1	Mitigation Acreage Required	= 0.720	Waters of the U.S.	= 0.365	Isolated Waters of Lake County	= 0.356	On-Site	=	Off-Site	=	Mitigation Bank	= 0.720	SMC Wetland Restoration Fund	=
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9C. Check box if State (IL) funds are being used for this development.  9D. Check box if this is a project being funded in part/whole by an SMC grant?

<p><b>10A. DESCRIPTION OF DEVELOPMENT</b> Roadway Widening and Underpass. See Submittal Narrative</p>		<p><b>10C. SINGLE FAMILY HOME ONLY</b> Estimated future home value:</p>	
<p><b>10B. NAME OF DEVELOPMENT</b> Washington Street</p>		<p><b>11. LEGAL DESCRIPTION</b></p>	
<p><b>10D. LOCATION OF DEVELOPMENT</b> Washington Street from Hainesville to Lake</p>		<p>Y. Section <u>22</u> Section <u>45N</u> Township <u>10E</u> Range</p>	
<p>Street Address</p>		<p>PIN</p>	
<p>Municipality Round Lake Park/Hainesville/Graylake/Avon Township</p>		<p>(If more than three PIN exists for the project, please include on a separate attachment)</p>	
<p>Des-Plaines, Fox Watershed <u>Mill Creek, Squaw Creek</u> Sub-Watershed</p>		<p>42.3569N Latitude <u>-88.05166W</u> Longitude</p>	

**12. LIST ALL LOCAL, STATE, AND FEDERAL PERMIT APPLICATION, OR APPROVAL LETTERS REQUIRED FOR DEVELOPMENT**

Permit Type	Issuing Agency	Permit Number	Application Filing Date	Permit Issue Date
USACE 404	United States Army Corps of Engineers	LR-2012-00193	7/16/12	
SWPPP	Illinois Environmental Protection Agency			

13A. UNDER PENALTY OF INTENTIONAL MISREPRESENTATION AND/OR PERJURY, I declare that I have examined and/or made this application and it is true and correct to the best of my knowledge and belief. I agree to construct said development in compliance with the permitted documents. I realize that the information that I have affirmed herein forms a basis for the issuance of the Watershed Development Permit(s) herein applied for and approval of plans in connection therewith shall not be construed to permit any construction upon said premises or use thereof in violation of any provision of any applicable ordinance or to excuse the owner or his successors in title from complying therewith.

Signature of Property Owner or Authorized Agent: Carla Burt Date: 1/13

13B. I CERTIFY that the plans/documents submitted for the above-referenced development have been prepared under the supervision of a professional engineer or certified wetland specialist as appropriate.

Signature of Professional Engineer: Eric W. Shaw P.E.# 062-060214 Date: 1/2/13 Signature of Certified Wetland Specialist: Lailah Reich CWS# C-115 Date: 12/8/12

Print Name of Engineer: Eric W. Shaw Print Name of Certified Wetland Specialist: Lailah Reich

FOR OFFICE USE ONLY

**14. PERMIT REVIEW FEES (separate checks)**  
 Stormwater Review Amount: \$ \$4200      Isolated Wetland Review Amount: \$ \$2720

**15. VARIANCE REQUEST**    Date Requested: \_\_\_\_\_    Date Advised: \_\_\_\_\_    Date Approved/Denied: \_\_\_\_\_

**16. SECURITIES (if required) AMOUNT**  
 Pre Construction \$ \_\_\_\_\_    Inspection Deposit \$ \_\_\_\_\_    5 Year Mitigation \$ \_\_\_\_\_  
 Surety \$ \_\_\_\_\_    Wetland Credit held by \_\_\_\_\_    TOTAL SECURITY \$ \_\_\_\_\_

**17. FINAL APPROVAL FOR PLANS ENTITLED AND DATED:**  
Washington Street from Hainesville Rd to Haryan Way, Vol 1&2 and Washington Street  
 Haryan Way to Lake Street, Roadway Reconstruction & Grade Separation Vol 1&2.  
See Permit Letter dated 8/6/14 for additional information.

Date of Signature \_\_\_\_\_    Approved By/Title \_\_\_\_\_    P.E.# / CWS# \_\_\_\_\_

Community Professional Engineer: \_\_\_\_\_  
 Certified Wetland Specialist: \_\_\_\_\_  
 Lake Co. Stormwater Management Commission 8/6/14 *Kot Woffel* Chief Engineer #062-000001  
 Enforcement Officer: \_\_\_\_\_

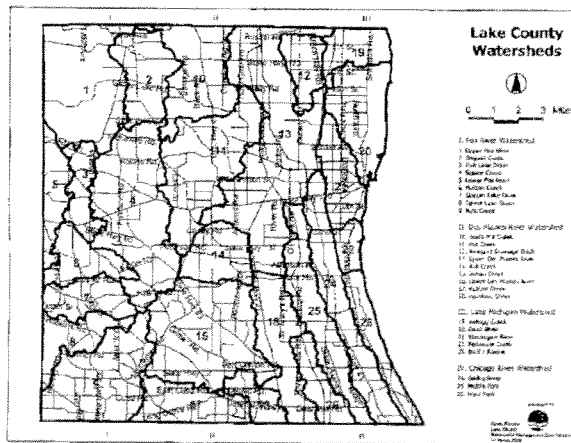
This permit is subject to the following conditions:

- (a) This permit does not convey title to the permittee or recognize title of the permittee to any submerged or other lands, and furthermore, does not convey, issue or provide any right or rights of occupancy or use of the public or private property on which the project or any part thereof will be located, or otherwise grant to the permittee any right or interest in or to the property, whether the property is owned or possessed by the County of Lake or by any private or public party or parties.
- (b) This permit does not release the permittee from liability for damage to persons or property resulting from the work covered by this permit, and does not authorize any injury to private property or invasion of private rights.
- (c) This permit does not relieve the permittee of the responsibility to obtain other federal, state or local authorizations required for the construction of the permitted activity, and if the permittee is required by law to obtain approval from any federal or state agency to do the work, this permit is not effective until those approvals are obtained.
- (d) The permittee shall, at his own expense, remove all temporary piling, cofferdams, false work, and material incidental to the construction of the project, from the flood-prone area, river, stream or lake in which the work is done.
- (e) The execution and details of the work authorized shall be subject to the approval of the SMC. SMC representatives shall have right to access to accomplish this purpose.
- (f) Application for permit will be considered full compliance by the permittee of the terms and conditions of the permit.
- (g) The SMC, in issuing this permit has relied upon the statements and representations made by the permittee; if any statement or representation made by the permittee is found to be false, the permit may be revoked at the option of the SMC; and when a permit is revoked all rights of the permittee under the permit are voided.
- (h) If the project authorized by this permit is located in or along Lake Michigan or a meandering lake, the permittee and successors shall make no claim whatsoever to any interest in any accretions caused by the project.
- (i) In issuing this permit, the SMC does not approve the adequacy of the design or structural strength of the structure or improvement.
- (j) Noncompliance with the conditions of this permit will be considered grounds for revocation.
- (k) If the work permitted is not completed within three years of the permit issuance date, this permit shall be void.

This permit is subject to further special conditions as follows:

**PROVIDE PRIOR NOTIFICATION OF THE PRE-CONSTRUCTION MEETING TO SMC (847) 377-7700 INSPECTOR FIVE WORKING DAYS BEFORE START OF CONSTRUCTION TO ENABLE SMC ATTENDANCE.**

**PROVIDE AS-BUILT PLANS OF THE STORMWATER MANAGEMENT SYSTEM TO SMC PRIOR TO FINAL SEEDING.**





**STORMWATER MANAGEMENT COMMISSION**

August 6, 2014

Mr. Todd Bright  
Transystems  
1475 East Woodfield Road, Ste 600  
Schaumburg, IL 60173-5440

Subject: SMC Watershed Development Permit #C12-83-020  
Washington Street Improvements  
West of Hainesville Road to Lake Street

**PERMIT ISSUANCE**

Dear Mr. Bright:

Accompanying this letter is the required Watershed Development Permit. This approval is subject to the conditions on the back of the permit including the following:

- Provide prior notification to Tim Cook (of the SMC) of the pre-construction meeting at least 5 calendar days in advance to enable SMC attendance.

The following items will be discussed at the preconstruction meeting:

- Location and materials for stabilized construction entrances
- The need for temporary perforated risers in detention areas
- Dewatering procedures

Provide as-built plans of the project including final calculations for detention basin volume, overflow elevations, compensatory storage (if needed), etc. Additional information is provided on the attached As-built Review Checklist.

This approval is based on the plans entitled:

**STATE OF ILLINOIS, COUNTY OF LAKE, PLANS FOR PROPOSED WASHINGTON STREET (A22) FROM HAINESVILLE ROAD TO HARYAN WAY, SECTION 11-00121-10-WR, Volumes 1 & 2, "West Contract", prepared by Patrick Engineering & Bollinger, Lach & Associates, received by SMC 7/31/14, 439-sheets total (electronic format)**

**STATE OF ILLINOIS, DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, PLANS FOR PROPOSED FEDERAL AID HIGHWAY, FAU 187**

500 W. Winchester Road • Libertyville, Illinois 60048 • 847/377-7700 • FAX 847/984-5747

950

**(WASHINGTON STREET), HARYAN WAY TO LAKE STREET, ROADWAY RECONSTRUCTION AND GRADE SEPARATION, SECTION 11-00121-11-BR, PROJECT NO. CMM-9003(923), LAKE COUNTY, C-91-181-12,** Volumes 1 & 2, "East Contract", prepared by Patrick Engineering & Bollinger, Lach & Associates, received by SMC 7/31/14, 496-sheets total (electronic format)

We would like to be of assistance. Do not hesitate to contact Tim Cook at (847)377-7703 if you have questions or would like to set up the pre-construction meeting.

If you have any additional concerns that have not been addressed by the regulatory staff, you may contact Chief Engineer Kurt Woolford [kwoolford@lakecountyiil.gov](mailto:kwoolford@lakecountyiil.gov) or Executive Director Michael Warner [mwarner@lakecountyiil.gov](mailto:mwarner@lakecountyiil.gov) at (847) 377-7700.


If you would like to provide feedback regarding the SMC permit/inspection process please go to: (password – survey)


[www.lakecountyiil.gov/Stormwater/Pages/permit-process-survey.aspx](http://www.lakecountyiil.gov/Stormwater/Pages/permit-process-survey.aspx)

[www.lakecountyiil.gov/Stormwater/Pages/inspection-process-survey.aspx](http://www.lakecountyiil.gov/Stormwater/Pages/inspection-process-survey.aspx)

Sincerely,

LAKE COUNTY STORMWATER MANAGEMENT COMMISSION

  
Robert D. Gardiner, P.E., CFM  
Permit Engineer

  
Kurt Woolford, P.E., CFM  
Chief Engineer

Attachment As-Built Checklist

C: Christopher Helland – Patrick Engineering  
Lailah Reich – Huff & Huff  
Melyssa Navis – USACE (LRC 2012-190)  
Mike Zemaitis – LCDOT  
Dan Krill -- Round Lake Park  
Vince Mosca -- Hainesville  
Bob Kula -- Avon Township  
Kurt Baumann -- Grayslake

## As-built Review Checklist

Revised April 25, 2005

Please provide the following information, where applicable, when submitting as-built plans to Lake County Stormwater Management Commission (SMC) for approval. Please ensure that the as-built information is annotated onto the permitted construction plans and is not a stand-alone current conditions exhibit.

- \_\_\_\_\_ Spot elevations, contours, and cross-sections for cut and fill areas located in the Regulatory Floodplain
- \_\_\_\_\_ Floodplain cut and fill calculations based on the as-built survey
- \_\_\_\_\_ Spot elevations and contours for all constructed detention and water quality treatment facilities, including:
  - 2-yr and 100-yr water elevation contours
  - Flared end section and restrictor inverts
  - Detailed topography for the emergency overflow spillway
  - Top of berm spot elevations surrounding detention facility
- \_\_\_\_\_ Detention volume calculations based on the as-built survey
- \_\_\_\_\_ Storm sewer locations, sizes, inverts and rim elevations
- \_\_\_\_\_ Top of curb elevations at locations of overland flow paths
- \_\_\_\_\_ Overland flow path (swale) as-built cross-section survey  
(A minimum of 2 cross-sections with at least 3 points, one on either bank and one at the invert)
- \_\_\_\_\_ Low floor elevations/lowest adjacent grade elevations for structures adjacent to Regulatory Floodplain, overland flow paths, or detention facilities
- \_\_\_\_\_ Verification of at least 90% coverage, on an areal basis, of plants comprising a minimum of 50% of the native vegetation seed list as approved on the permitted plan set at the end of the second full growing season.



Illinois Environmental Protection Agency  
 Permit Section, Division of Water Pollution Control  
 P.O. Box 19276  
 Springfield, Illinois 62794-9276

For IEPA Use:

Application for Permit or Construction Approval  
 WPC-PS-1

1. Owner Name: Lake County Public Works  
 Name of Project: Washington Street from Haryan Way to Lake Street  
 Township: Avon County: Lake

2. Brief Description of Project:  
Relocation of sanitary 21" sanitary sewer due to Washington Street underpass construction.

3. Documents Being Submitted: If the Project involves any of the items listed below, submit the corresponding schedule, and check the appropriate boxes.

Private Sewer Connection/Extension	<u>Schedule</u>			
Sewer Extension Construct Only	A/B	<input checked="" type="checkbox"/>	Spray Irrigation	<u>Schedule</u>
Sewage Treatment Works	C	<input type="checkbox"/>	Septic Tanks	H
Excess Flow Treatment	D	<input type="checkbox"/>	Industrial Treatment/Pretreatment	I
Lift Station/Force Main	E	<input type="checkbox"/>	Waste Characteristics	J
Fast Track Service Connection	F	<input type="checkbox"/>	Erosion Control	N
Sludge Disposal	FTP	<input type="checkbox"/>	Trust Disclosure	P
	G	<input type="checkbox"/>		T

Plans: Title Proposed Highway Plans FAU 187 (Washington Street) Haryan Way to Lake Street Roadway

Reconstruction and Grade Separation No. of Pages: 481

Specifications: Title Supplemental Specifications and Recurring Special Provisions

No. of Books/Pages: 679

Other Documents: \_\_\_\_\_  
 (Please Specify)

3.1 Illinois Historic Preservation Agency approval letter: Yes  No

4. Land Trust: Is the project identified in item number 1 herein, for which a permit is requested, to be constructed on land which is the subject of a trust? Yes  No

If yes, Schedule T (Trust Disclosure) must be completed and item number 7.1.1 must be signed by a beneficiary, trustee or trust officer.

5. This is an Application for (Check Appropriate Line):

- A. Joint Construction and Operating Permit
- B. Authorization to Construct (See Instructions) NPDES Permit No. IL00 \_\_\_\_\_
- C. Construct Only Permit (Does Not Include Operations)
- D. Operate Only Permit (Does Not Include Construction)



6. Certifications and Approval:

6.1 Certificate by Design Engineer (When required: refer to instructions)

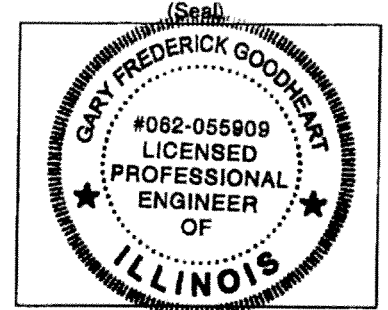
I hereby certify that I am familiar with the information contained in this application, including the attached schedules indicated above, and that to the best of my knowledge and belief such information is true, complete and accurate. The plans and specifications (specifications other than Standard Specifications or local specifications on file with this Agency) as described above were prepared by me or under my direction.

Engineer Name: Gary F. Goodheart P.E.

Registration Number: 062 - 055909  
(3 digits) (6 digits)

Firm: Patrick Engineering Inc.

Address: 4970 Varsity Drive



City: Lisle State: IL Zip: 60532 Phone No: 630-795-7225

Signature X [Handwritten Signature] Date: 7/18/2014

7. Certifications and Approvals for Permits:

7.1 Certificate by Applicant(s)

I/We hereby certify that I/we have read and thoroughly understand the conditions and requirements of this Application, and am/are authorized to sign this application in accordance with the Rules and Regulations of the Illinois Pollution Control Board. I/We hereby agree to conform with the Standard Conditions and with any other Special Conditions made part of this Permit.

7.1.1 Name of Applicant for Permit to Construct: Lake County Division of Transportation

Address: 600 W Winchester Road

City: Libertyville State: IL Zip Code: 60048

Signature X [Handwritten Signature] Date: 7/31/14

Printed Name: Paula J. Trigg, P.E. Phone No: (847) 377-7400

Title: Director of Transportation/County Engineer

Organization: Lake County Division of Transportation

7.1.2 Name of Applicant for Permit to Own and Operate: Lake County Public Works

Address: 650 W. Winchester Road

City: Libertyville State: IL Zip Code: 60048

Signature X [Handwritten Signature] Date: 7/28/2014

Printed Name: Peter E Kolb Phone No: (847) 377-7500

Title: Director of Public Works

7.2 Attested (Required When Applicant is a Unit of Government)

Signature X Willard R. Helander Date: 8/4/14

Title: Willard Helander - County Clerk  
(City Clerk, Village Clerk, Sanitary District Clerk, Etc.)

7.3 Applications from non-governmental applicants which are not signed by the owner, must be signed by a principal executive officer of at least the level of vice president, or a duly authorized representative.

7.4 Certificate By Intermediate Sewer Owner

I hereby certify that (Please check one):

- 1. The sewers to which this project will be tributary have adequate reserve capacity to transport the wastewater that will be added by this project without causing a violation of the environmental Protection Act or Subtitle C, Chapter I, or
- 2. The Illinois Pollution Control Board, in PCB \_\_\_\_\_ dated \_\_\_\_\_ granted a variance from Subtitle C, Chapter I to allow construction of facilities that are the subject of this application.

Name and location of sewer system to which this project will be tributary:

Northeast Central (NEC) Interceptor Sewer

Sewer System Owner: Lake County Public Works

Address: 650 W. Winchester Road

City: Libertyville State: IL Zip Code: 60048

Signature X Peter E. Kolb Date: 7-28-2014

Printed Name: Peter E Kolb Phone No: (847) 377-7500

Title: Director of Public Works

7.4.1 Additional Certificate By Intermediate Sewer Owner

I hereby certify that (Please check one):

- 1. The sewers to which this project will be tributary have adequate reserve capacity to transport the wastewater that will be added by this project without causing a violation of the environmental Protection Act or Subtitle C, Chapter I, or
- 2. The Illinois Pollution Control Board, in PCB \_\_\_\_\_ dated \_\_\_\_\_ granted a variance from Subtitle C, Chapter I to allow construction facilities that are the subject of this application.
- 3. Not applicable

Name and location of sewer system to which this project will be tributary:

LAKE COUNTY, LC LINE, GURNEE

Sewer System Owner: NORTH SHORE SANITARY DISTRICT

Address: PO. BOX 750, Wm. KOEPEL DR.

City: GURNEE State: IL Zip Code: 60031

Signature X [Signature] Date: 8/20/14

Printed Name: \_\_\_\_\_ Phone No: \_\_\_\_\_

Title: \_\_\_\_\_

7.5 Certificate By Waste Treatment Works Owner

I hereby certify that (Please check one):

- 1. The waste treatment plant to which this project will be tributary has adequate reserve capacity to treat the wastewater that will be added by this project without causing a violation of the Environmental Protection Act or Subtitle C, Chapter I, or
- 2. The Illinois Pollution Control Board, in PCB \_\_\_\_\_ dated \_\_\_\_\_ granted a variance from Subtitle C, Chapter I to allow construction and operation of the facilities that are the subject of this application.
- 3. Not applicable

I also certify that, if applicable, the industrial waste discharges described in the application are capable of being treated by the treatment works.

Name of Waste Treatment Works: GURNEE SEWAGE TREATMENT PLANT

Waste Treatment Works Owner: North Shore Sanitary District

Address: P.O. Box 750, Wm. Koepsel Dr.

City: GURNEE State: IL Zip Code: 60031

Signature X *Greg Greenyo* Date: 8/20/14

Printed Name: GREG GREENYO Phone No: 847-623-6060

Title: PROJECT MANAGER

Please return completed form to the following address:

Illinois Environmental Protection Agency  
Permit Section, Division of Water Pollution Control  
P.O. Box 19276  
Springfield, Illinois 62794-9276

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 ½, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
DIVISION OF WATER POLLUTION CONTROL  
PERMIT SECTION  
Springfield, Illinois 62794-9276

SCHEDULE A/B

APPLICATION FOR SANITARY SEWER: (please check one or both boxes as applicable)

- Service Connection – Schedule A
- Publicly Owned or Regulated Extensions – Schedule B

1. **NAME OF PROJECT:** Washington Street from Haryan Way to Lake Street
2. **TYPE OF SERVICE(S):** Residential  ; Commercial  ; Light Industrial (Domestic Waste Only)  ;  
Manufacturing  ; Recreational  ; Other  (check all that apply)
3. **NATURE OF PROJECT:** Project consists of: a sewer extension  ; a sewer connection  ;  
a trunk sewer  ; a replacement sewer  ; a relief sewer  ; an interceptor sewer  ;  
a new sanitary sewer  . (check all that apply)
4. **PROJECT LOCATION, SERVICE AREA AND POPULATION:** Submit map(s) of the service area that includes the following:
  - 4.1 An 8½ X 11 inch detailed project location map or USGS map showing the project with respect to major roadways. In lieu of this map, a letter from the Illinois Historic Preservation Agency indicating compliance with the Illinois Historic Preservation Act for this project may be submitted.
  - 4.2 The proposed sewer layout and project location.  
Township 45N Section 22 Range 10E
  - 4.3 Residential and/or non-residential areas and their associated waste loads to be immediately served by the sewers of this project.
  - 4.4 Potential residential and/or non-residential areas and their associated loads must be included in the overall design of the sewers of this project.
5. **FACILITIES PLANNING AREA:** This project is  is not  being constructed entirely within the Facilities Planning Area (FPA) boundaries. Name of FPA: Northeast Central Lake FPA
6. **TYPE OF DEVELOPMENT:** The following design criteria should be used in estimating the population equivalent (P.E.) of a residential building:

Efficiency or Studio Apartment	= 1	P.E.	Commonly used quantities of sewage flows from miscellaneous type facilities are listed in Appendix B, Table No. 2 of the Illinois Recommended Standards for Sewage Works.
1 Bedroom Apartment	= 1.5	P.E.	
2 Bedroom Apartment	= 3	P.E.	
3 Bedroom Apartment	= 3	P.E.	
Single Family Home	= 3.5	P.E.	
Mobile Home	= 2.25	P.E.	

- 6.1 **RESIDENTIAL BUILDINGS:** Number of building(s) 0 ;  
Number of single family dwelling building(s) 0 ; Number of multiple dwelling buildings\* 0 ;  
Estimated total population equivalent 0 P.E.  
\* Please provide an itemized list for each multiple dwelling building including: Number of 1, 2 and 3 bedroom units; the total P.E. for the each building and the total P.E. for multiple family dwellings.

6.2 **NON-RESIDENTIAL BUILDINGS:** Describe use of building(s)

Principal product(s) or activities

Number of non-residential building(s) to be served under this Permit \_\_\_\_\_

Non domestic liquid waste is  (see section 6.5) is not  produced inside the building(s). If liquid wastes other than domestic are produced, submit Schedule N.

Estimated number of employees \_\_\_\_\_; Estimated number of occupants (transients) \_\_\_\_\_.

Estimated population equivalent (one population equivalent is 100 gallons of sewage per day, containing 0.17 pounds of BOD<sub>5</sub> and 0.20 pounds of suspended solids).

Flow P.E. \_\_\_\_\_; BOD P.E. \_\_\_\_\_; Suspended Solids P.E. \_\_\_\_\_.

6.3 Total loading for project (Sum of 6.1 and 6.2) Design Average Flow \_\_\_\_\_ 0 \_\_\_\_\_ GPD; Design Max.

Flow \_\_\_\_\_ 0 \_\_\_\_\_ GPD; P.E. \_\_\_\_\_ 0 \_\_\_\_\_ BOD; P.E. \_\_\_\_\_ 0 \_\_\_\_\_ Suspended Solids

6.4 Commencing July 1, 2003, Section 12.2 of the Environmental Protection Act (415 ILCS 5/12.2, as amended by P.A. 93-32) requires the Agency to collect a fee for certain applications for the installation of sanitary sewer connections and extension. Except for the conditions listed below, the following fee schedule shall apply:

Fee Dollars	Population Equivalents
100	1
400	2 - 20
800	21 - 100
1200	101 - 499
2400	500 or more

Please send the appropriate fee based upon section 6.4 or 6.5; certified or cashiers check made out to: "Treasurer, State of Illinois, Environmental Protection Permit and Inspection Fund" with the applicant's Federal Employee Identification Number (FEIN) appearing on the face of the check and submit along with this schedule. Any fee remitted to the Agency shall not be refunded at any time or for any reason, either in whole or in part.

The Sewer Permit fee does not apply to:

- a) Any Department, Agency or Unit of State Government
- b) Any unit of local government where all of the following conditions are met;
  - 1) The cost of the installation or extension is paid wholly from monies of the unit of local government, state grants or loans, federal grants or loads, or any combination thereof;
  - 2) The unit of local government is NOT given monies, reimbursed or paid, either in whole or in part, by another person (except for State grants or loans or federal grants or loans);
- c) 1) Include a certified copy of the budget item or the board or council minutes which authorize the construction of this project with only local funds; and
  - 2) I/we

*Peter E. Roll*

(Signature for Unit of Government)

hereby certify that subsections (b)(1), (b)(2) and (c)(1) have been met.

6.5 A \$1,000 fee shall be required for any industrial wastewater source that does not require pretreatment of the wastewater prior to discharge to the publicly owned treatment works or publicly regulated treatment works.

7. **DEVIATION FROM DESIGN CRITERIA:** The design criteria for sewers are contained in the "Illinois Recommended Standards for Sewage Works", Current Edition. This submittal does  does not  include deviations from said criteria. If deviations are included, justification for said deviations must be attached.

8. **INFILTRATION/EXFILTRATION LIMITS:** 200 gallons per inch diameter of sewer pipe per mile per day.

9. **SUMMARY OF SEWERS:**

Submit plan and profile drawings for all sanitary sewer extensions and for all sanitary sewer connections where either the domestic wastewater source serves more than one building, where the domestic wastewater source is 15 P.E. or more, where non-domestic waste is produced or where the connection is not direct to either a publicly-owned or publicly-regulated sewer.

	Service Connections		Publicly Owned or Regulated Extensions			
Pipe size – inches			21			
Total Length – feet			1511			
Min. slope used - %			0.10			
Max. slope used - %			0.14			
Min. cover over sewers - feet			7			
Pipe Material & Specs.			PVC SDR 26 per ASTM 3034			
Joint Material & Specs.			Joints per ASTM D 3212			
Total Manholes			8			
Max. Distance Between Manholes			360			
Bedding Class for Rigid Pipe (A, B, or C per ASTM C12)			per IDOT Specs			
Bedding Class for Flexible Pipe (IA, IB, II, or III per ASTM 2321-89)			N/A			

9.1 Is the project located in a flood plain? YES  NO  If yes, contact the Illinois Department of Natural Resources, Division of Water Resources Management for further permit requirements.

9.2 Water tight manhole covers used on all manholes where the manhole tops are below cover or where the tops may be flooded by surface runoff or high water? YES  NO

10. **EROSION CONTROL:** The design criteria for Erosion Control are contained in the "Illinois Urban Manual" Current Edition, distributed by the National Resource Conservation Service. This submittal does  does not  include deviation from said criteria. If deviations are included, justification for said criteria must be attached. (See instructions for Schedule P to determine if Schedule P must be submitted.)

11. EXISTING SEWER SYSTEM:

A. This project will connect to one of the following:

- 1. existing sanitary sewer
- 2. existing combined sewer
- 3. permitted sanitary sewer
- 4. permitted combined sewer
- 5. proposed sanitary sewer
- 6. proposed combined sewer

If permitted but not constructed and operational provide permit number \_\_\_\_\_

B. Size and location of downstream sewer(s):

21" running parallel to Washington St. on the north side, approximately 500 feet west of Lake St.

12. WATER SUPPLY PROTECTION: The horizontal and/or vertical separation between sanitary sewers and water mains is in accordance with Section 370.350 of the Illinois Recommended Standards for Sewage Works. YES  NO  .

The location of proposed and existing watermain(s) must be shown in both the plan and profile views on plan sheet(s) for each water-sewer line crossing and at all locations within 10 feet horizontal distance of the proposed sewer line. Detailed drawing(s) for crossings, either typical or site-specific, shall be shown on the plan sheet(s).

12.1 HORIZONTAL SEPARATION: All sewer line(s) is(are) 10 feet from water line(s) YES  NO

If no, provide justification AND describe the precautionary features against contamination

All proposed forcemain(s) 10 feet from water line(s) YES  NO  N/A  .

12.2 VERTICAL SEPARATION:

A. The water line(s) is(are) at least 18 inches above the sewer line(s) YES  NO  . If no, continue with 12.2.B and provide justification below as to why this is not possible and describe precautionary measures taken to prevent contamination.

B. The water line(s) is(are) above the sewer line(s) but less than 18 inches YES  NO  . If no, continue with 12.2.C and provide justification below as to why this is not possible and describe precautionary measures taken to prevent contamination.

C. The water line(s) is(are) at least 18 inches below the sewer line(s) YES  NO  . If no, provide justification below as to why this is not possible and describe precautionary measures taken to prevent contamination.

Justification and precautionary measures:

12.3 Proximity to wells, reservoirs, and other potable water sources: YES  N/A  .

If Yes, Minimum distance \_\_\_\_\_ feet. Describe precautionary measures taken to avoid contamination:

\_\_\_\_\_

Location of all potable water sources shown on plan sheets. YES  NO  NO KNOWN SOURCES

13. PIPE AND MANHOLE TESTING:

- Is infiltration testing included in plans, specifications, or special provisions? YES  NO
- Is exfiltration test included in plans, specifications, or special provisions? YES  NO
- Is air testing included in plans, specifications, or special provisions? YES  NO
- Leakage testing for manholes included in plans, specifications, or special provisions? YES  NO

**14. FLEXIBLE PIPE TESTING:**

Is deflection test included in plans, specifications, or special provisions in accordance with the Illinois Recommended Standards for Sewage Works, Current Edition? YES  NO  N/A

**15. MISCELLANEOUS REQUIREMENTS:**

The following requirements should be included on the plan sheets where so indicated. For items where this is not specified, the requirements may be on the plan sheets, in the specifications, or in the special provisions:

- 15.1 Standard Specifications for Water and Sewer Main Construction in Illinois, Current Edition, govern the construction of this project. YES  NO  . If no, please provide specifications.
- 15.2 Pipe and joint ASTM/AWWA designation included on plan sheets. YES  NO
- 15.3 All flexible gravity sewer pipe installed in accordance with ASTM D2321-89; embedment materials for bedding, haunching, and initial backfill to at least 6 inches over the top of the pipe with Class IA or IB or II or III; processed material produced for highway construction used in the project classified according to particle size, shape, and gradation in accordance with ASTM D2321-89, Section 9 and Table 1. YES  NO  N/A
- 15.4 All rigid gravity sewer pipe installed in accordance with ASTM C12 and bedding material Class A, B, or C. YES  NO  N/A
- 15.5 Pickholes in all manholes likely to be flooded not larger than 1 inch in diameter and of the concealed type. YES  NO  N/A
- 15.6 All manholes numbered. YES  NO  N/A
- 15.7 Match lines shown on all plan sheets. YES  NO  N/A

*This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.*



This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that section. Failure to do so may prevent this form from being processed and could result in your application being denied.

**For IEPA Use:**

LOG #

DATE RECEIVED:

**ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
DIVISION OF WATER POLLUTION CONTROL  
PERMIT SECTION  
Springfield, Illinois 62794-9276**

**Schedule P - Erosion Control**

- Name of Project Washington Street from Haryan Way to Lake Street
- Total area disturbed by excavation: 9066 sf
- Summary of erosion control practices:

			Area Controlled (Sq. Ft.)	Permanent (P) or Temporary (T)
Vegetative Control	<u>N/A</u>	(Sq. Feet)	<u>                    </u>	<u>                    </u>
Interceptor Ditches	<u>N/A</u>	(Feet)	<u>                    </u>	<u>                    </u>
Berms	<u>N/A</u>	(Feet)	<u>                    </u>	<u>                    </u>
Sediment Basins	<u>N/A</u>	(Cu. Yd.)	<u>                    </u>	<u>                    </u>
Debris Basins	<u>N/A</u>	(Cu. Ft.)	<u>                    </u>	<u>                    </u>
Desilting Basins	<u>N/A</u>	(Cu. Ft.)	<u>                    </u>	<u>                    </u>
Silt Traps	<u>N/A</u>	(Cu. Ft.)	<u>                    </u>	<u>                    </u>
Mulching and Matting	<u>113,811 sf</u>	(Cu. Ft./Sq. Ft.)	<u>113,811</u>	<u>T</u>
Other	<u>N/A</u>	(Indicate)	<u>                    </u>	<u>                    </u>

- Attach topographical or plan maps of construction area and indicate erosion control practices.
- Drainage area (above and including construction site) 12.14 ac
- Slope categories of construction site:

	Area (acres)	Disposition of collected sediment
6.1 0 - 2% slope	<u>8898 sf</u>	<u>Replaced soil on eroded area and reseeded.</u>
6.2 2 - 4% slope	<u>                    </u>	<u>                    </u>
6.3 4 - 6% slope	<u>                    </u>	<u>                    </u>
6.4 6% slope or greater	<u>168 sf</u>	<u>Replaced soil on eroded area and reseeded.</u>

Please check one below.

Erosion control practices identified above will be constructed in accordance with Illinois Urban Manual, 1995.

OR

Plans or specifications for the above referenced erosion control practices are attached.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
WATER POLLUTION CONTROL PERMIT

LOG NUMBERS: 2014-59201

PERMIT NO.: 2014-HB-59201

FINAL PLANS, SPECIFICATIONS, APPLICATION  
AND SUPPORTING DOCUMENTS

DATE ISSUED: October 16, 2014

PREPARED BY: Patrick Engineering Inc.

**SUBJECT:** LAKE COUNTY PUBLIC WORKS - Relocation of 21" Sanitary Sewer  
(North Shore Sanitary District - Gurnee Sewage Treatment Plant) - Sanitary Sewer Permit

PERMITTEE TO CONSTRUCT

Lake County Division of Transportation  
600 W Winchester Road  
Libertyville, IL 60048

PERMITTEE TO OWN AND OPERATE

Lake County Public Works  
650 W. Winchester Road  
Libertyville, IL 60048

Permit is hereby granted to the above designated Permittee(s) to construct and/or operate water pollution control facilities described as follows (quantities are approximate):

1,511 feet of 21 inch sanitary sewer and 8 manholes at a sewer relocation project due to Washington Street underpass construction (0 P.E., 0 GPD, DAF) located at portion of Washington Street from Haryan Way to Lake Street in Avon township with discharge to an existing 21 inch sanitary sewer tributary to the above indicated sewage treatment plant.

This Permit is issued subject to the following Special Condition(s). If such Special Condition(s) require(s) additional or revised facilities, satisfactory engineering plan documents must be submitted to this Agency for review and approval for issuance of a Supplemental Permit.

**SPECIAL CONDITION 1:** The Permittee to Construct shall be responsible for obtaining an NPDES Storm Water Permit prior to initiating construction if the construction activities associated with this project will result in the disturbance of one (1) or more acres total land area.

An NPDES Storm Water Permit may be obtained by submitting a properly completed Notice of Intent (NOI) form by certified mail to the Agency's Division of Water Pollution Control - Permit Section.

**THE STANDARD CONDITIONS OF ISSUANCE INDICATED ON THE REVERSE SIDE MUST BE COMPLIED WITH IN FULL. READ ALL CONDITIONS CAREFULLY.**

SAK:MNP:n:\bowl\permits\wpdocs\docs\permits\statecon\patel\2014-59201hb.docx

DIVISION OF WATER POLLUTION CONTROL

cc: IEPA - Des Plaines FOS  
Patrick Engineering Inc.  
North Shore Sanitary District  
Records - Municipal



Alan Keller, P.E.  
Manager, Permit Section

462 A



Illinois Environmental Protection Agency  
 Permit Section, Division of Water Pollution Control  
 P.O. Box 19276  
 Springfield, Illinois 62794-9276

For IEPA Use:

Application for Permit or Construction Approval  
 WPC-PS-1

1. Owner Name: Village of Grayslake  
 Name of Project: Washington Street from Haryan Way to Lake Street  
 Township: Avon County: Lake

2. Brief Description of Project:  
Relocation of 8" sanitary sewer due to Washington Street underpass construction.

3. Documents Being Submitted: If the Project involves any of the items listed below, submit the corresponding schedule, and check the appropriate boxes.

Private Sewer Connection/Extension	<u>Schedule</u>	Spray Irrigation	<u>Schedule</u>
Sewer Extension Construct Only	A/B <input checked="" type="checkbox"/>	Septic Tanks	H <input type="checkbox"/>
Sewage Treatment Works	C <input type="checkbox"/>	Industrial Treatment/Pretreatment	I <input type="checkbox"/>
Excess Flow Treatment	D <input type="checkbox"/>	Waste Characteristics	J <input type="checkbox"/>
Lift Station/Force Main	E <input type="checkbox"/>	Erosion Control	N <input type="checkbox"/>
Fast Track Service Connection	F <input type="checkbox"/>	Trust Disclosure	P <input checked="" type="checkbox"/>
Sludge Disposal	FTP <input type="checkbox"/>		T <input type="checkbox"/>
	G <input type="checkbox"/>		

Plans: Title Proposed Highway Plans FAU 187 (Washington Street) Haryan Way to Lake Street Roadway

Reconstruction and Grade Separation No. of Pages: 496

Specifications: Title Supplemental Specifications and Recurring Special Provisions

No. of Books/Pages: 679

Other Documents: \_\_\_\_\_  
 (Please Specify)

3.1 Illinois Historic Preservation Agency approval letter: Yes  No

4. Land Trust: Is the project identified in item number 1 herein, for which a permit is requested, to be constructed on land which is the subject of a trust? Yes  No

If yes, Schedule T (Trust Disclosure) must be completed and item number 7.1.1 must be signed by a beneficiary, trustee or trust officer.

5. This is an Application for (Check Appropriate Line):

- A. Joint Construction and Operating Permit
- B. Authorization to Construct (See Instructions) NPDES Permit No. IL00 \_\_\_\_\_
- C. Construct Only Permit (Does Not Include Operations)
- D. Operate Only Permit (Does Not Include Construction)

6. Certifications and Approval:

6.1 Certificate by Design Engineer (When required: refer to instructions)

I hereby certify that I am familiar with the information contained in this application, including the attached schedules indicated above, and that to the best of my knowledge and belief such information is true, complete and accurate. The plans and specifications (specifications other than Standard Specifications or local specifications on file with this Agency) as described above were prepared by me or under my direction.

Engineer Name: Gary F. Goodheart, P.E.

Registration Number: 062 - 055909  
(3 digits) (6 digits)

Firm: Patrick Engineering Inc.

Address: 4970 Varsity Drive



City: Lisle State: IL Zip: 60532 Phone No: (630) 795-7225

Signature X [Handwritten Signature] Date: 8/5/2014

Lic Exp 11/30/2015

7. Certifications and Approvals for Permits:

7.1 Certificate by Applicant(s)

I/We hereby certify that I/we have read and thoroughly understand the conditions and requirements of this Application, and am/are authorized to sign this application in accordance with the Rules and Regulations of the Illinois Pollution Control Board. I/We hereby agree to conform with the Standard Conditions and with any other Special Conditions made part of this Permit.

7.1.1 Name of Applicant for Permit to Construct: Lake County Division of Transportation

Address: 600 W Winchester Road

City: Libertyville State: IL Zip Code: 60048

Signature X [Handwritten Signature] Date: Aug 7, 2014

Printed Name: PAULA TRIGA Phone No: 847-377-7400

Title: County Engineer

Organization: LAKE COUNTY DIVISION OF TRANSPORTATION

7.1.2 Name of Applicant for Permit to Own and Operate: Village of Grayslake

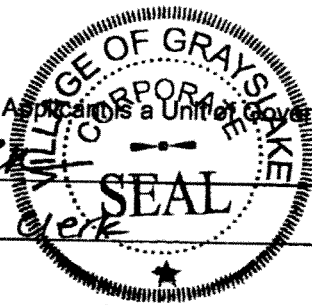
Address: 10 South Seymour Avenue

City: Grayslake State: IL Zip Code: 60030

Signature X [Handwritten Signature] Date: 8-7-14

Printed Name: MICHAEL J. ELLIS Phone No: 847-223-8515

Title: VILLAGE MANAGER



7.2 Attested (Required When Applicant is a Unit of Government)

Signature X [Signature] Date: 8-7-2014

Title: Deputy Village Clerk  
(City Clerk, Village Clerk, Sanitary District Clerk, Etc.)

7.3 Applications from non-governmental applicants which are not signed by the owner, must be signed by a principal executive officer of at least the level of vice president, or a duly authorized representative.

7.4 Certificate By Intermediate Sewer Owner

I hereby certify that (Please check one):

- 1. The sewers to which this project will be tributary have adequate reserve capacity to transport the wastewater that will be added by this project without causing a violation of the environmental Protection Act or Subtitle C, Chapter I, or
- 2. The Illinois Pollution Control Board, in PCB \_\_\_\_\_ dated \_\_\_\_\_ granted a variance from Subtitle C, Chapter I to allow construction of facilities that are the subject of this application.

Name and location of sewer system to which this project will be tributary:

Northeast Central (NEC) Interceptor Sewer

Sewer System Owner: Lake County Public Works

Address: 650 Winchester Road

City: Libertyville State: IL Zip Code: 60048

Signature X [Signature] Date: 8-7-2014

Printed Name: PETER E. KOLB Phone No: 847-377-7500

Title: DIRECTOR

7.4.1 Additional Certificate By Intermediate Sewer Owner

I hereby certify that (Please check one):

- 1. The sewers to which this project will be tributary have adequate reserve capacity to transport the wastewater that will be added by this project without causing a violation of the environmental Protection Act or Subtitle C, Chapter I, or
- 2. The Illinois Pollution Control Board, in PCB \_\_\_\_\_ dated \_\_\_\_\_ granted a variance from Subtitle C, Chapter I to allow construction facilities that are the subject of this application.
- 3. Not applicable

Name and location of sewer system to which this project will be tributary:

LAKE COUNTY, LC LINE, GURNEE

Sewer System Owner: NORTH SHORE SANITARY DISTRICT

Address: P.O. BOX 750, Wm. KOEPEL DR.

City: GURNEE State: IL Zip Code: 60031

Signature X [Signature] Date: 8/20/14

Printed Name: \_\_\_\_\_ Phone No: \_\_\_\_\_

Title: \_\_\_\_\_

7.5 Certificate By Waste Treatment Works Owner

I hereby certify that (Please check one):

- 1. The waste treatment plant to which this project will be tributary has adequate reserve capacity to treat the wastewater that will be added by this project without causing a violation of the Environmental Protection Act or Subtitle C, Chapter I, or
- 2. The Illinois Pollution Control Board, in PCB \_\_\_\_\_ dated \_\_\_\_\_ granted a variance from Subtitle C, Chapter I to allow construction and operation of the facilities that are the subject of this application.
- 3. Not applicable

I also certify that, if applicable, the industrial waste discharges described in the application are capable of being treated by the treatment works.

Name of Waste Treatment Works: GURNEE SEWAGE TREATMENT PLANT

Waste Treatment Works Owner: North Shore Sanitary District

Address: P.O. Box 750, Wm. KOEPEL DR.

City: GURNEE State: IL Zip Code: 60031

Signature X *Greg Grenyo* Date: 8/20/14

Printed Name: GREG GRENYO Phone No: 847-623-6060

Title: PROJECT MANAGER

Please return completed form to the following address:

Illinois Environmental Protection Agency  
Permit Section, Division of Water Pollution Control  
P.O. Box 19276  
Springfield, Illinois 62794-9276

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 ½, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
DIVISION OF WATER POLLUTION CONTROL  
PERMIT SECTION  
Springfield, Illinois 62794-9276

**SCHEDULE A/B**

**APPLICATION FOR SANITARY SEWER:** (please check one or both boxes as applicable)

- Service Connection – Schedule A
- Publicly Owned or Regulated Extensions – Schedule B

1. **NAME OF PROJECT:** Washington Street from Haryan Way to Lake Street

2. **TYPE OF SERVICE(S):** Residential  ; Commercial  ; Light Industrial (Domestic Waste Only)  ;  
Manufacturing  ; Recreational  ; Other  (check all that apply)

3. **NATURE OF PROJECT:** Project consists of: a sewer extension  ; a sewer connection  ;  
a trunk sewer  ; a replacement sewer  ; a relief sewer  ; an interceptor sewer  ;  
a new sanitary sewer  . (check all that apply)

4. **PROJECT LOCATION, SERVICE AREA AND POPULATION:** Submit map(s) of the service area that includes the following:

4.1 An 8½ X 11 inch detailed project location map or USGS map showing the project with respect to major roadways. In lieu of this map, a letter from the Illinois Historic Preservation Agency indicating compliance with the Illinois Historic Preservation Act for this project may be submitted.

4.2 The proposed sewer layout and project location.  
Township 45N Section 22 Range 10E

4.3 Residential and/or non-residential areas and their associated waste loads to be immediately served by the sewers of this project.

4.4 Potential residential and/or non-residential areas and their associated loads must be included in the overall design of the sewers of this project.

5. **FACILITIES PLANNING AREA:** This project is  is not  being constructed entirely within the Facilities Planning Area (FPA) boundaries. Name of FPA: Northeast Central Lake FPA

6. **TYPE OF DEVELOPMENT:** The following design criteria should be used in estimating the population equivalent (P.E.) of a residential building:

Efficiency or Studio Apartment	= 1	P.E.	Commonly used quantities of sewage flows from miscellaneous type facilities are listed in Appendix B, Table No. 2 of the Illinois Recommended Standards for Sewage Works.
1 Bedroom Apartment	= 1.5	P.E.	
2 Bedroom Apartment	= 3	P.E.	
3 Bedroom Apartment	= 3	P.E.	
Single Family Home	= 3.5	P.E.	
Mobile Home	= 2.25	P.E.	

6.1 **RESIDENTIAL BUILDINGS:** Number of building(s) 0 ;  
Number of single family dwelling building(s) 0 ; Number of multiple dwelling buildings\* 0 ;  
Estimated total population equivalent 0 P.E.

\* Please provide an itemized list for each multiple dwelling building including: Number of 1, 2 and 3 bedroom units; the total P.E. for the each building and the total P.E. for multiple family dwellings.

6.2 **NON-RESIDENTIAL BUILDINGS:** Describe use of building(s)

Principal product(s) or activities

Number of non-residential building(s) to be served under this Permit \_\_\_\_\_

Non domestic liquid waste is  (see section 6.5) is not  produced inside the building(s). If liquid wastes other than domestic are produced, submit Schedule N.

Estimated number of employees \_\_\_\_\_; Estimated number of occupants (transients) \_\_\_\_\_.

Estimated population equivalent (one population equivalent is 100 gallons of sewage per day, containing 0.17 pounds of BOD<sub>5</sub> and 0.20 pounds of suspended solids).

Flow P.E. \_\_\_\_\_; BOD P.E. \_\_\_\_\_; Suspended Solids P.E. \_\_\_\_\_.

6.3 Total loading for project (Sum of 6.1 and 6.2) Design Average Flow \_\_\_\_\_ 0 \_\_\_\_\_ GPD; Design Max. Flow \_\_\_\_\_ 0 \_\_\_\_\_ GPD; P.E. \_\_\_\_\_ 0 \_\_\_\_\_ BOD; P.E. \_\_\_\_\_ 0 \_\_\_\_\_ Suspended Solids


6.4 Commencing July 1, 2003, Section 12.2 of the Environmental Protection Act (415 ILCS 5/12.2, as amended by P.A. 93-32) requires the Agency to collect a fee for certain applications for the installation of sanitary sewer connections and extension. Except for the conditions listed below, the following fee schedule shall apply:

Fee Dollars	Population Equivalents
100	1
400	2 - 20
800	21 - 100
1200	101 - 499
2400	500 or more

Please send the appropriate fee based upon section 6.4 or 6.5; certified or cashiers check made out to: "Treasurer, State of Illinois, Environmental Protection Permit and Inspection Fund" with the applicant's Federal Employee Identification Number (FEIN) appearing on the face of the check and submit along with this schedule. Any fee remitted to the Agency shall not be refunded at any time or for any reason, either in whole or in part.

The Sewer Permit fee does not apply to:

- a) Any Department, Agency or Unit of State Government
- b) Any unit of local government where all of the following conditions are met;
  - 1) The cost of the installation or extension is paid wholly from monies of the unit of local government, state grants or loans, federal grants or loads, or any combination thereof;
  - 2) The unit of local government is NOT given monies, reimbursed or paid, either in whole or in part, by another person (except for State grants or loans or federal grants or loads);
- c) 1) Include a certified copy of the budget item or the board or council minutes which authorize the construction of this project with only local funds; and

2) I/we   
\_\_\_\_\_  
(Signature for Unit of Government)

hereby certify that subsections (b)(1), (b)(2) and (c)(1) have been met.

6.5 A \$1,000 fee shall be required for any industrial wastewater source that does not require pretreatment of the wastewater prior to discharge to the publicly owned treatment works or publicly regulated treatment works.



7. **DEVIATION FROM DESIGN CRITERIA:** The design criteria for sewers are contained in the "Illinois Recommended Standards for Sewage Works", Current Edition. This submittal does  does not  Include deviations from said criteria. If deviations are included, justification for said deviations must be attached.

8. **INFILTRATION/EXFILTRATION LIMITS:** 200 gallons per inch diameter of sewer pipe per mile per day.

9. **SUMMARY OF SEWERS:**

Submit plan and profile drawings for all sanitary sewer extensions and for all sanitary sewer connections where either the domestic wastewater source serves more than one building, where the domestic wastewater source is 15 P.E. or more, where non-domestic waste is produced or where the connection is not direct to either a publicly-owned or publicly-regulated sewer.

Pipe size -- inches	Service Connections		Publicly Owned or Regulated Extensions			
Total Length -- feet			8			
Min. slope used - %			125			
Max. slope used - %			1.47			
Min. cover over sewers - feet			1.47			
Pipe Material & Specs.			12			
Joint Material & Specs.			PVC SDR 26			
Total Manholes			Joints per ASTM D 3212			
Max. Distance Between Manholes			1			
Bedding Class for Rigid Pipe (A, B, or C per ASTM C12)			130			
Bedding Class for Flexible Pipe (IA, IB, II, or III per ASTM 2321-89)			per IDOT Specs			
			N/A			

9.1 Is the project located in a flood plain? YES  NO  If yes, contact the Illinois Department of Natural Resources, Division of Water Resources Management for further permit requirements.

9.2 Water tight manhole covers used on all manholes where the manhole tops are below cover or where the tops may be flooded by surface runoff or high water? YES  NO

10. **EROSION CONTROL:** The design criteria for Erosion Control are contained in the "Illinois Urban Manual" Current Edition, distributed by the National Resource Conservation Service. This submittal does  does not  include deviation from said criteria. If deviations are included, justification for said criteria must be attached. (See instructions for Schedule P to determine if Schedule P must be submitted.)

11. EXISTING SEWER SYSTEM:

A. This project will connect to one of the following:

- 1. existing sanitary sewer
- 2. existing combined sewer
- 3. permitted sanitary sewer
- 4. permitted combined sewer
- 5. proposed sanitary sewer
- 6. proposed combined sewer

If permitted but not constructed and operational provide permit number \_\_\_\_\_

B. Size and location of downstream sewer(s):

8" connection to LCPW trunk sewer crossing Washington St., approximately 500 feet west of Lake St.

12. WATER SUPPLY PROTECTION: The horizontal and/or vertical separation between sanitary sewers and watermain(s) is in accordance with Section 370.350 of the Illinois Recommended Standards for Sewage Works. YES  NO

The location of proposed and existing watermain(s) must be shown in both the plan and profile views on plan sheet(s) for each water-sewer line crossing and at all locations within 10 feet horizontal distance of the proposed sewer line. Detailed drawing(s) for crossings, either typical or site-specific, shall be shown on the plan sheet(s).

12.1 HORIZONTAL SEPARATION: All sewer line(s) is(are) 10 feet from water line(s) YES  NO

If no, provide justification AND describe the precautionary features against contamination

All proposed forcemain(s) 10 feet from water line(s) YES  NO  N/A

12.2 VERTICAL SEPARATION:

A. The water line(s) is(are) at least 18 inches above the sewer line(s) YES  NO  . If no, continue with 12.2.B and provide justification below as to why this is not possible and describe precautionary measures taken to prevent contamination.

B. The water line(s) is(are) above the sewer line(s) but less than 18 inches YES  NO  . If no, continue with 12.2.C and provide justification below as to why this is not possible and describe precautionary measures taken to prevent contamination.

C. The water line(s) is(are) at least 18 inches below the sewer line(s) YES  NO  . If no, provide justification below as to why this is not possible and describe precautionary measures taken to prevent contamination.

Justification and precautionary measures:

12.3 Proximity to wells, reservoirs, and other potable water sources: YES  N/A

If Yes, Minimum distance \_\_\_\_\_ feet. Describe precautionary measures taken to avoid contamination:

Location of all potable water sources shown on plan sheets. YES  NO  NO KNOWN SOURCES

13. PIPE AND MANHOLE TESTING:

- Is infiltration testing included in plans, specifications, or special provisions? YES  NO
- Is exfiltration test included in plans, specifications, or special provisions? YES  NO
- Is air testing included in plans, specifications, or special provisions? YES  NO
- Leakage testing for manholes included in plans, specifications, or special provisions? YES  NO

**14. FLEXIBLE PIPE TESTING:**

Is deflection test included in plans, specifications, or special provisions in accordance with the Illinois Recommended Standards for Sewage Works, Current Edition? YES  NO  N/A

**15. MISCELLANEOUS REQUIREMENTS:**

The following requirements should be included on the plan sheets where so indicated. For items where this is not specified, the requirements may be on the plan sheets, in the specifications, or in the special provisions:

- 15.1 Standard Specifications for Water and Sewer Main Construction in Illinois, Current Edition, govern the construction of this project. YES  NO  . If no, please provide specifications.
- 15.2 Pipe and joint ASTM/AWWA designation included on plan sheets. YES  NO
- 15.3 All flexible gravity sewer pipe installed in accordance with ASTM D2321-89; embedment materials for bedding, haunching, and initial backfill to at least 6 inches over the top of the pipe with Class IA or IB or II or III; processed material produced for highway construction used in the project classified according to particle size, shape, and gradation in accordance with ASTM D2321-89, Section 9 and Table 1. YES  NO  N/A  .
- 15.4 All rigid gravity sewer pipe installed in accordance with ASTM C12 and bedding material Class A, B, or C. YES  NO  N/A
- 15.5 Pickholes in all manholes likely to be flooded not larger than 1 inch in diameter and of the concealed type. YES  NO  N/A
- 15.6 All manholes numbered. YES  NO  N/A
- 15.7 Match lines shown on all plan sheets. YES  NO  N/A

*This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.*

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that section. Failure to do so may prevent this form from being processed and could result in your application being denied.

**For IEPA Use:**  
LOG #  
DATE RECEIVED:

**ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
DIVISION OF WATER POLLUTION CONTROL  
PERMIT SECTION  
Springfield, Illinois 62794-9276**

**Schedule P - Erosion Control**

- Name of Project Washington Street from Haryan Way to Lake Street
- Total area disturbed by excavation: 900 sf
- Summary of erosion control practices:

			Area Controlled (Sq. Ft.)	Permanent (P) or Temporary (T)
Vegetative Control	<u>N/A</u>	(Sq. Feet)	<u>                    </u>	<u>                    </u>
Interceptor Ditches	<u>N/A</u>	(Feet)	<u>                    </u>	<u>                    </u>
Berms	<u>N/A</u>	(Feet)	<u>                    </u>	<u>                    </u>
Sediment Basins	<u>N/A</u>	(Cu. Yd.)	<u>                    </u>	<u>                    </u>
Debris Basins	<u>N/A</u>	(Cu. Ft.)	<u>                    </u>	<u>                    </u>
Desilting Basins	<u>N/A</u>	(Cu. Ft.)	<u>                    </u>	<u>                    </u>
Silt Traps	<u>N/A</u>	(Cu. Ft.)	<u>                    </u>	<u>                    </u>
Mulching and Matting	<u>113,811 sf</u>	(Cu. Ft./Sq. Ft.)	<u>113,811 sf</u>	<u>                    </u>
Other	<u>N/A</u>	(Indicate)	<u>                    </u>	<u>                    </u>

- Attach topographical or plan maps of construction area and indicate erosion control practices.
- Drainage area (above and including construction site) 12.14 ac
- Slope categories of construction site:

	Area (acres)	Disposition of collected sediment
6.1 0 - 2% slope	<u>750 sf</u>	<u>Replace soil on eroded area and repave road</u>
6.2 2 - 4% slope	<u>150 sf</u>	<u>Replace soil on eroded area and reseeded</u>
6.3 4 - 6% slope	<u>                    </u>	<u>                    </u>
6.4 6% slope or greater	<u>                    </u>	<u>                    </u>

Please check one below.

- Erosion control practices identified above will be constructed in accordance with Illinois Urban Manual, 1995.  
OR  
 Plans or specifications for the above referenced erosion control practices are attached.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
WATER POLLUTION CONTROL PERMIT

LOG NUMBERS: 2014-59200

PERMIT NO.: 2014-HB-59200

FINAL PLANS, SPECIFICATIONS, APPLICATION  
AND SUPPORTING DOCUMENTS

DATE ISSUED: October 16, 2014

PREPARED BY: Patrick Engineering Inc.

SUBJECT: GRAYSLAKE - Relocation of 8" Sanitary Sewer  
(North Shore Sanitary District - Gurnee Sewage Treatment Plant) - Sanitary Sewer Permit

PERMITTEE TO CONSTRUCT

PERMITTEE TO OWN AND OPERATE

Lake County Division of Transportation  
600 W Winchester Road  
Libertyville, IL 60048

Village of Grayslake  
10 South Seymour Avenue  
Grayslake, IL 60030

Permit is hereby granted to the above designated Permittee(s) to construct and/or operate water pollution control facilities described as follows (quantities are approximate):

125 feet of 8 inch sanitary sewer and 1 manhole at a sewer relocation project due to Washington Street underpass construction (0 P.E., 0 GPD, DAF) located at portion of Washington Street from Haryan Way to Lake Street in Avon township with discharge to an existing 8 inch sanitary sewer tributary to the above indicated sewage treatment plant.

This Permit is issued subject to the following Special Condition(s). If such Special Condition(s) require(s) additional or revised facilities, satisfactory engineering plan documents must be submitted to this Agency for review and approval for issuance of a Supplemental Permit.

SPECIAL CONDITION 1: The Permittee to Construct shall be responsible for obtaining an NPDES Storm Water Permit prior to initiating construction if the construction activities associated with this project will result in the disturbance of one (1) or more acres total land area.

An NPDES Storm Water Permit may be obtained by submitting a properly completed Notice of Intent (NOI) form by certified mail to the Agency's Division of Water Pollution Control - Permit Section.

THE STANDARD CONDITIONS OF ISSUANCE INDICATED ON THE REVERSE SIDE MUST BE COMPLIED WITH IN FULL. READ ALL CONDITIONS CAREFULLY.

SAK:MNP:n:\bow\permits\wpdocs\docs\permits\statecon\patel\2014-59200hb.docx

DIVISION OF WATER POLLUTION CONTROL

cc: IEPA - Des Plaines FOS  
Patrick Engineering Inc.  
North Shore Sanitary District  
Lake County Public Works  
Records - Municipal

*Alan Keller by Aro*

Alan Keller, P.E.  
Manager, Permit Section

477A

**ILLINOIS ENVIRONMENTAL PROTECTION AGENCY**

1021 North Grand Avenue, East; Post Office Box 19276; Springfield, IL 62794-9276

Division of Public Water Supplies

Telephone 217/782-1724

**PUBLIC WATER SUPPLY CONSTRUCTION PERMIT**

SUBJECT: GRAYSLAKE (Lake County-0970250)

**RECEIVED**

Permit Issued to:  
Village President and Board of Trustees  
10 S. Seymour Avenue  
Grayslake, IL 60030-1542

AUG 25 2014

BOLLINGER, LACH  
& ASSOCIATES

PERMIT NUMBER: 0052-FY2015

DATE ISSUED: August 20, 2014

PERMIT TYPE: Water Main

The issuance of this permit is based on plans and specifications prepared by the engineers/architects indicated, and are identified as follows. This permit is issued for the construction and/or installation of the public water supply improvements described in this document, in accordance with the provisions of the "Environmental Protection Act", Title IV, Sections 14 through 17, and Title X, Sections 39 and 40, and is subject to the conditions printed on the last page of this permit and the ADDITIONAL CONDITIONS listed below.

FIRM: Bollinger, Lach & Associates, Inc.

NUMBER OF PLAN SHEETS: 14

TITLE OF PLANS: "FAU 187 (Washington St.) Haryan Way to Lake Street \*\*SR\*\*"

**PROPOSED IMPROVEMENTS:**

\*\*\*Install approx. 1,610 feet of 12-inch and 42 feet of 6-inch water main\*\*\*

**ADDITIONAL CONDITIONS:**

1. All water mains shall be satisfactorily disinfected prior to use. In accordance with the requirements of AWWA C651-05, at least one set of samples shall be collected from every 1,200 feet of new water main, plus one set from the end of the line and at least one set from each branch. Satisfactory disinfection shall be demonstrated in accordance with the requirements of 35 Ill. Adm. Code 652.203.
2. There are no further conditions to this permit.

DCC:GAZ: dsa

cc: Bollinger, Lach & Associates, Inc.  
Elgin Region  
Lake County Health Department



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David C. Cook, P.E.  
Acting Manager Permit Section  
Division of Public Water Supplies

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue, East; Post Office Box 19276; Springfield, IL 62794-9276

Division of Public Water Supplies

Telephone 217/782-1724

PUBLIC WATER SUPPLY CONSTRUCTION PERMIT

SUBJECT: CENTRAL LAKE COUNTY JAWA (Lake County-0971070)

Permit Issued to:  
Operations Director, Central Lake County JAWA  
200 Rockland Road  
Lake Bluff, IL 60044

PERMIT NUMBER: 0131-FY2015

DATE ISSUED: September 18, 2014  
PERMIT TYPE: Water Main

The issuance of this permit is based on plans and specifications prepared by the engineers/architects indicated, and are identified as follows. This permit is issued for the construction and/or installation of the public water supply improvements described in this document, in accordance with the provisions of the "Environmental Protection Act", Title IV, Sections 14 through 17, and Title X, Sections 39 and 40, and is subject to the conditions printed on the last page of this permit and the ADDITIONAL CONDITIONS listed below.

FIRM: CDM Smith, Inc.  
NUMBER OF PLAN SHEETS: 9  
TITLE OF PLANS: "Washington Street-CLCJAWA 20" Transmission Main Realignment \*\*SR\*\*"

PROPOSED IMPROVEMENTS:

\*\*\*Installation of approximately 1,700 feet of 20-inch water main\*\*\*

ADDITIONAL CONDITIONS:

1. All water mains shall be satisfactorily disinfected prior to use. In accordance with the requirements of AWWA C651-05, at least one set of samples shall be collected from every 1,200 feet of new water main, from the end of the line and from each branch. Satisfactory disinfection shall be demonstrated in accordance with the requirements of 35 Ill. Adm. Code 652.203.
2. There are no further conditions to this permit.

DCC:MPH: dsa

cc: CDM Smith, Inc.  
Elgin Region  
Lake County Health Department



David C. Cook, P.E.  
Acting Manager Permit Section  
Division of Public Water Supplies

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

Uncontaminated Soil Certification
by Licensed Professional Engineer or Licensed Professional Geologist
for Use of Uncontaminated Soil as Fill in a CCDD or Uncontaminated Soil Fill Operation
LPC-663

Revised in accordance with 35 Ill. Adm. Code 1100, as
amended by PCB R2012-009 (eff. Aug. 27, 2012)

This certification form is to be used by professional engineers and professional geologists to certify, pursuant to 35 Ill. Adm. Code 1100.205(a)(1)(B), that soil (i) is uncontaminated soil and (ii) is within a pH range of 6.26 to 9.0. If you have questions about this form, please telephone the Bureau of Land Permit Section at 217/524-3300.

This form may be completed online, saved locally, printed and signed, and submitted to prospective clean construction or demolition debris (CCDD) fill operations or uncontaminated soil fill operations.

I. Source Location Information

(Describe the location of the source of the uncontaminated soil)

Project Name: Washington Street Improvements Office Phone Number, if available: 630-241-6000

Physical Site Location (address, including number and street):

Washington Street extending from Haryan Way to Lake Street

City: Grayslake State: IL Zip Code: 60192

County: Lake Township:

Lat/Long of approximate center of site in decimal degrees (DD.ddddd) to five decimal places (e.g., 40.67890, -90.12345):

Latitude: 42.357154° Longitude: -88.048267°

(Decimal Degrees) (-Decimal Degrees)

Identify how the lat/long data were determined:

- GPS Map Interpolation Photo Interpolation Survey Other

Google Earth, approximate center of project area.

IEPA Site Number(s), if assigned: BOL: BOW: BOA:

II. Owner/Operator Information for Source Site

Site Owner

Site Operator

Name: Lake County Division of Transportation

Name: Lake County Division of Transportation

Street Address: 600 W Winchester Road

Street Address: 600 W Winchester Road

PO Box:

PO Box:

City: Libertyville State: IL

City: Libertyville State: IL

Zip Code: 60631 Phone:

Zip Code: 60631 Phone:

Contact: Mike Zemaitis

Contact: Mike Zemaitis

Email, if available: MZemaitis@lakecountyil.gov

Email, if available: MZemaitis@lakecountyil.gov

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed \$50,000 for the violation and an additional civil penalty of not to exceed \$10,000 for each day during which the violation continues (415 ILCS 5/42). This form has been approved by the Forms

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Project Name: Washington Street Improvements

Latitude: 42.357154° Longitude: -88.048267°

Uncontaminated Site Certification

**III. Basis for Certification and Attachments**

For each item listed below, reference the attachments to this form that provide the required information.

- a. A Description of the soil sample points and how they were determined to be sufficient in number and appropriately located [35 Ill. Adm. Code 1100.610(a)]:

See PESA/PSI report. Project Corridor depicted on attached figure (9-1). Note the location of the exclusion zone within the Railroad ROW in the central portion of the Project Corridor. The exclusion area requires further assessment prior to determining applicability of soils as CCDD.

- b. Analytical soil testing results to show that soil chemical constituents comply with the maximum allowable concentrations established pursuant to 35 Ill. Adm. Code Part 1100, Subpart F and that the soil pH is within the range of 6.25 to 9.0, including the documentation of chain of custody control, a copy of the lab analysis; the accreditation status of the laboratory performing the analysis; and certification by an authorized agent of the laboratory that the analysis has been performed in accordance with the Agency's rules for the accreditation of environmental and the scope of the accreditation [35 Ill. Adm. Code 1100.201(g), 1100.205(a), 1100.610]:

See PESA/PSI report. Analytical testing (see attached tables 8-1 through 8-4 from report) indicate achievement of MACs. Samples SB-1 and SB-2 represents sample collected from area of improvements nearest to the RR ROW and are considered representative of the entire southern portion of the Project Corridor.

**IV. Certification Statement, Signature and Seal of Licensed Professional Engineer or Licensed Professional Geologist**

I, Shane Cuplin, P.G. (name of licensed professional engineer or geologist) certify under penalty of law that the information submitted, including but not limited to, all attachments and other information, is to the best of my knowledge and belief, true, accurate and complete. In accordance with the Environmental Protection Act [415 ILCS 5/22.51 or 22.51a] and 35 Ill. Adm. Code 1100.205(a), I certify that the soil from this site is uncontaminated soil. I also certify that the soil pH is within the range of 6.25 to 9.0. In addition, I certify that the soil has not been removed from the site as part of a cleanup or removal of contaminants. All necessary documentation is attached.

**Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))**

Company Name: Huff & Huff, Inc.  
 Street Address: 915 Harger Road, Suite 330  
 City: Oak Brook State: IL Zip Code: 60523  
 Phone: (630) 684-9100

Shane Cuplin, P.G.  
 Printed Name:

[Signature]  
 Licensed Professional Engineer or  
 Licensed Professional Geologist Signature:

8-5-14  
 Date:



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## **EXECUTIVE SUMMARY**

### **PRELIMINARY ENVIRONMENTAL SITE ASSESSMENT AND PRELIMINARY SITE INVESTIGATION REPORT**

The EXECUTIVE SUMMARY for the PRELIMINARY SITE ASSESSMENT AND PRELIMINARY SITE INVESTIGATION REPORT is attached.

THE ENTIRE 153-PAGE PRELIMINARY SITE INVESTIGATION REPORT FOR THIS PROJECT IS AVAILABLE ELECTRONICALLY FOR BIDDERS' REVIEW BY ENTERING THE FOLLOWING URL:

<https://clients.patrickco.com/sites/LCDOT/WashStPSI/default.aspx>

User: report

Password (case sensitive): Lcdot2014

## EXECUTIVE SUMMARY

This is the initial Preliminary Environmental Site Assessment (PESA) and Preliminary Site Investigation (PSI) of man-made hazards that may be encountered within the proposed improvements along Washington Street, Grayslake, Lake County, Illinois. The planned improvements include constructing a grade separation (roadway under railroad) and associated road reconstruction with the project limits extending from Haryan Way to Lake Street (Project Corridor). Compensatory storage (storm water) is also planned and placed in the agricultural field northwest of the intersection of Washington Street and Lake Street. As part of the grade separation, a roadway runaround will be placed in the northern portion of the Project Corridor during construction. The overall length of the Project Corridor is approximately 0.5 miles. The approximately 100 foot width of Canadian Northern Railroad right of way (ROW) is included in this PESA/PSI; however, is considered an exclusion area as related to potential special waste consideration. This Project Corridor area (referred to as eastern project) is part of a larger series of improvements occurring along Washington Street. Soils management information for the western portion (Grandview Drive to Haryan Way) is addressed under a separate cover.

PESA site reconnaissance activities were completed on May 23, 2014. The database search for the Project Corridor was reviewed prior to the site visit. Based on a database search reviewed prior to the site reconnaissance and the site reconnaissance activities, one potentially impacted property (PIP) was revealed in connection to the Project Corridor. The PSI field activities were conducted on June 25, 2014.

The screening process included historical review, a database search, review of available information on the internet, and a site visit. Historical resources included historical aerial photos of the Project Corridor which were reviewed for evidence of former sites that may pose a hazard to the Project Corridor. The database search was reviewed for information (on a local, state, or federal level) on properties that may pose a hazard to the Project Corridor. The site visit was conducted to inspect the sites identified in the database search, as well as identify additional sites adjacent to the Project Corridor with storage areas, spills, staining, or other indications of potential environmental concern. Sites identified through the screening process were reviewed to determine the PIP status in connection to the Project Corridor. The following tables (Tables E-1 through E-3) summarize these sites.

**TABLE E-1  
SUMMARY OF SITES DETERMINED TO BE PIPS**

<b>Site Name</b>	<b>Figure 5-1 Site Number</b>	<b>Address</b>	<b>Reason(s)<sup>1</sup></b>
Railroad	5	Railroad intersecting central portion of proposed improvements	Possible petroleum and herbicide impacts

<sup>1</sup>Note that only the essential database listings are listed in Table E-1

**TABLE E-2  
SUMMARY OF SITES IDENTIFIED ADJACENT TO THE PROJECT CORRIDOR  
WITH DE MINIMIS CONDITIONS<sup>1</sup>**

<b>Site Name</b>	<b>Figure 5-1 Site Number</b>	<b>Address</b>	<b>Reason(s)</b>
Agricultural Fields	4	21238 West Washington	FINDS/FRS Database Listing
Former Farmstead	6	21238 West Washington	FINDS/FRS Database Listing
Electrical Substation	9	Southeast of Lake Street and North Washington	No Database Listings and Located Across Lake Street

<sup>1</sup>De Minimis based on definition included in ASTM E1527-13

**TABLE E-3  
SUMMARY OF SITES IDENTIFIED ADJACENT TO THE PROJECT CORRIDOR  
WITH NO PIPs OR DE MINIMIS CONDITIONS**

<b>Site Name</b>	<b>Figure 5-1 Site Number</b>	<b>Address</b>	<b>Reason(s)</b>
Residential Homes	1	Residential Area South of Washington	No Areas of Concern
Residential Homes	2	Residential Area North of Washington	No Areas of Concern
Public Park	3	Southeast of Haryan Way and Washington Street	No Areas of Concern
Kinder Care	7	790 North Lake Street	No Areas of Concern
Residential Homes	8	Northeast of Lake Street and Washington Street	No Areas of Concern

Analytical testing from the portion of the Project Corridor nearest to the railroad PIP indicated soils from the Project Corridor may be handled as Clean Construction or Demolition Debris (CCDD) material, as the sample in this segment achieve the Maximum Allowable Concentrations (MACs) and soil pH requirement. Note that 100 foot wide ROW for the railroad is considered an exclusion zone as sampling was not conducted within the area. Based on planned improvements in conjunction with the PESA and PSI findings, additional investigation of the Project Corridor is not necessary.



**DEPARTMENT OF THE ARMY**  
**CHICAGO DISTRICT, CORPS OF ENGINEERS**  
231 SOUTH LA SALLE STREET  
CHICAGO, ILLINOIS 60604-1437

REPLY TO  
ATTENTION OF:

September 25, 2014

Technical Services Division  
Regulatory Branch  
LRC-2012-00190

**SUBJECT: Request Authorization to Impact 0.091 Acres of Wetland for the Washington Street Improvements, West of Hainesville Road to Lake Street in Lake County, Illinois**

Michael Zemaitis  
Lake County Division of Transportation  
600 W. Winchester Road  
Libertyville, Illinois 60048

Dear Mr. Zemaitis:

The letter supersedes the previously authorized letter dated September 12, 2014. The U.S. Army Corps of Engineers, Chicago District, has completed its review of your notification for authorization under the Regional Permit Program (RPP), submitted on your behalf by Patrick Engineering. This office has verified that your proposed activity complies with the terms and conditions of Regional Permit 3 and the overall RPP under Category I of the Regional Permit Program. The activity may be performed without further authorization from this office provided the activity is conducted in compliance with the terms and conditions of the RPP.

This verification expires three (3) years from the date of this letter and covers only your activity as described in your notification and as shown on the plans entitled "State of Illinois County of Lake Plans For Proposed Washington Street (A22) From Hainesville Road to Haryan Way Section 11-00121-10-WR, Volume 1, Sheets 1-438" dated June 2, 2014 prepared by Patrick Engineering, Inc and "State of Illinois, Department of Transportation, Division of Highways, Plans for Proposed Federal and Highway, FAU (Washington Street) Haryan Way to Lake Street, Roadway Reconstruction and Grade Separation, Section 11-00121-11-BR, Volume 2 of 2, Project NO. CMM-9003 (923), Lake County, C-91-187, Section 1-00121-11-BR, County Lake, Total Sheets 312-496" Caution must be taken to prevent construction materials and activities from impacting waters of the United States beyond the scope of this authorization. If you anticipate changing the design or location of the activity, you should contact this office to determine the need for further authorization.

This authorization is contingent upon implementing and maintaining soil erosion and sediment controls in a serviceable condition throughout the duration of the project. You shall comply with the Lake County Stormwater Management Commission (LCSMC)'s written and

verbal recommendations regarding the soil erosion and sediment control (SESC) plan and the installation and maintenance requirements of the SESC practices on-site. You shall notify this office and the SMC of any changes or modifications to the approved plan set. Please be aware that field conditions during project construction may require the implementation of additional SESC measures for further protection of aquatic resources. If you fail to implement corrective measures, this office may require more frequent site inspections to ensure the installed SESC measures are acceptable.

You shall complete the following requirements:

1. You shall schedule a preconstruction meeting with LCSMC to discuss the SESC plan and the installation and maintenance requirements of the SESC practices on the site.
2. You shall notify the LCSMC of any changes or modifications to the approved plan set. Field conditions during project construction may require the implementation of additional SESC measures. If you fail to implement corrective measures, this office may require more frequent site inspections to ensure the installed SESC measures are acceptable.

This verification does not obviate the need to obtain all other required Federal, state, or local approvals before starting work. Please note that Section 401 Water Quality Certification has been issued by IEPA for this RP. Enclosed are the IEPA Section 401 Water Quality Certification conditions. If you have any questions regarding Section 401 certification, please contact Mr. Dan Heacock at IEPA Division of Water Pollution Control, Permit Section #15, by telephone at (217) 782-3362.

Once you have completed the authorized activity, please sign and return the enclosed compliance certification. If you have any questions, please contact Melyssa R. Navis of my staff by telephone at 312-846-5533, or email at [melyssa.r.navis@usace.army.mil](mailto:melyssa.r.navis@usace.army.mil).

Sincerely,

Digitally signed by  
CHERNICH.KATHLEEN.G.12303  
65616

Date: 2014.09.30 14:52:06  
-05'00'

Kathleen G. Chernich  
Chief, East Section  
Regulatory Branch

Enclosures

Copy Furnished:

Lake County Stormwater Management Commission (Kurt Woolford)  
Patrick Engineering (Eric Chow)



**PERMIT COMPLIANCE  
CERTIFICATION**

Permit Number: LRC-2012-00190  
Permittee: Lake County Division of Transportation  
Date: September 12, 2014

I hereby certify that the work authorized by the above-referenced permit has been completed in accordance with the terms and conditions of said permit and if applicable, compensatory wetland mitigation was completed in accordance with the approved mitigation plan.<sup>1</sup>

\_\_\_\_\_  
PERMITTEE

\_\_\_\_\_  
DATE

Upon completion of the activity authorized by this permit and any mitigation required by the permit, this certification must be signed and returned to the following address:

U.S. Army Corps of Engineers  
Chicago District, Regulatory Branch  
231 South LaSalle Street, Suite 1500  
Chicago, Illinois 60604-1437

Please note that your permitted activity is subject to compliance inspections by Corps of Engineers representatives. If you fail to comply with this permit, you may be subject to permit suspension, modification, or revocation.

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<sup>1</sup> If compensatory mitigation was required as part of your authorization, you are certifying that the mitigation area has been graded and planted in accordance with the approved plan. You are acknowledging that the maintenance and monitoring period will begin after a site inspection by a Corps of Engineers representative or after thirty days of the Corps' receipt of this certification. You agree to comply with all permit terms and conditions, including additional reporting requirements, for the duration of the maintenance and monitoring period.



# *IMPORTANT NOTICE*

## CORPORATIONS

License must be signed by the President or a Vice President of the Corporation or Company, or be accompanied by a certified resolution of the Board of Directors authorizing execution by a lesser official.

## PARTNERSHIP

License must be signed by all of the partners.

## MUNICIPALITIES OR GOVERNMENTAL AGENCIES

License must be accompanied by a certified resolution authorizing the official signing the License to execute on behalf of the Governmental Body. The resolution should not be certified by the same official who executed the License.

## RIGHT OF ENTRY LICENSE AGREEMENT

Wisconsin Central Ltd. (hereinafter called Railroad Company) hereby grants pursuant to this Right of Entry License Agreement (hereinafter called License) to \_\_\_\_\_ (hereinafter called Licensee) license and permission, at Licensee's sole cost, risk and expense, to enter Railroad Company's property in the vicinity of \_\_\_\_\_, Railroad Milepost \_\_\_\_\_, \_\_\_\_\_ Subdivision for purposes related to \_\_\_\_\_ near \_\_\_\_\_, IL on, over and near Railroad Company's tracks and right-of-way, as generally shown on Location Exhibit, attached hereto and made a part hereof.

Licensee shall pay to Railroad Company upon execution of this License the sum of **\$750.00** for the privileges granted by this License. The aforesaid sum is not refundable in the event Licensee elects not to enter upon Railroad Company's property or in the event Railroad Company elects to terminate this License for any reason whatsoever.

Licensee shall not enter Railroad Company's premises for the purpose as set forth above without having first given Railroad Company's Engineering Manager or their authorized representative at least five (5) working days advance notice of the date Licensee plans to commence the work.

Railroad Company shall have the right, but not the duty, to require Licensee to furnish detailed plans prior to entry upon the premises and to view and inspect any activity or work on or above Railroad Company's property. If in the sole opinion of the authorized representative of Railroad Company any said activity or work is undesirable for any reason, Railroad Company shall have the right to terminate this License at once.

Railroad Company shall have the right, but not the duty, to restrict Licensee's activity on Railroad Company's property in any way that Railroad Company may, in its sole opinion, deem necessary from time to time and shall also have the right, but not the duty, to require Licensee to adopt and take any safety precautions that Railroad Company may, in its sole opinion, deem necessary from time to time. No work shall be performed or equipment located within twenty-five feet (25') of the centerline of the nearest railroad track without the expressed permission of Railroad Company's Engineering Manager or their duly authorized representative and then only when either the track has been removed from service or Railroad Company flag protection is provided.

Railroad Company may, at Licensee's sole cost, risk and expense, furnish whatever protective services it considers necessary, including, but not limited to, flag protection, and inspectors.

Licensee shall at all times conduct its work in accordance with any and all "Special Provisions" which may be appended hereto which, by reference hereto, are hereby made a part hereof.

**AS A CONSIDERATION AND AS A CONDITION, WITHOUT WHICH THIS LICENSE WOULD NOT HAVE BEEN GRANTED, LICENSEE AGREES TO INDEMNIFY AND SAVE HARMLESS RAILROAD COMPANY, ITS PARENTS, AFFILIATES, AND THEIR DIRECTORS, OFFICERS, EMPLOYEES AND AGENTS AND TO ASSUME ALL LIABILITY FOR DEATH OR INJURY TO ANY PERSONS, INCLUDING, BUT NOT LIMITED TO, OFFICERS, EMPLOYEES, AGENTS, PATRONS AND LICENSEES OF THE PARTIES HERETO, AND FOR ALL LOSS, DAMAGE OR INJURY TO ANY PROPERTY, INCLUDING, BUT NOT LIMITED TO, THAT BELONGING TO THE PARTIES HERETO, TOGETHER WITH ALL EXPENSES, ATTORNEYS' FEES AND COSTS INCURRED OR SUSTAINED BY RAILROAD COMPANY, WHETHER IN DEFENSE OF ANY SUCH CLAIMS, DEMANDS, ACTIONS AND**

**CAUSES OF ACTION OR IN THE ENFORCEMENT OF THE INDEMNIFICATION RIGHTS HEREBY CONFERRED, IN ANY MANNER OR DEGREE CAUSED BY, ATTRIBUTABLE TO OR RESULTING FROM THE EXERCISE OF THE RIGHTS HEREIN GRANTED, OR THE FAILURE OF LICENSEE TO CONFORM TO CONDITIONS OF THIS LICENSE, WORK PERFORMED BY RAILROAD COMPANY FOR LICENSEE UNDER THE TERMS OF THIS LICENSE OR THE CONSTRUCTION, MAINTENANCE, REPAIR, RENEWAL, ALTERATION, CHANGE, RELOCATION, EXISTENCE, PRESENCE, USE, OPERATION OR REMOVAL OF ANY STRUCTURE INCIDENT THERETO, OR FROM ANY ACTIVITY CONDUCTED ON OR OCCURRENCE ORIGINATING ON THE AREA COVERED BY THIS LICENSE, REGARDLESS OF ANY NEGLIGENCE OF RAILROAD COMPANY, ITS OFFICERS, EMPLOYEES AND AGENTS. SAID LICENSEE AGREES ALSO TO RELEASE, INDEMNIFY AND SAVE HARMLESS RAILROAD COMPANY, ITS OFFICERS, EMPLOYEES AND AGENTS FROM ALL LIABILITY TO LICENSEE, ITS OFFICERS, EMPLOYEES, AGENTS OR PATRONS, RESULTING FROM RAILROAD OPERATIONS AT OR NEAR THE AREA IN WHICH LICENSE IS TO BE EXERCISED, WHETHER OR NOT THE DEATH, INJURY OR DAMAGE RESULTING THEREFROM MAY BE DUE TO WHOLE OR IN PART TO THE NEGLIGENCE OF RAILROAD COMPANY, ITS OFFICERS, EMPLOYEES OR AGENTS. AT THE ELECTION OF RAILROAD COMPANY, LICENSEE, UPON NOTICE TO THAT EFFECT, SHALL ASSUME OR JOIN IN THE DEFENSE OF ANY CLAIM BASED UPON ALLEGATIONS PURPORTING TO BRING SAID CLAIM WITHIN THE COVERAGE OF THIS SECTION.**

Before commencing work and until this License shall be terminated, Licensee shall provide and maintain the following insurance in form and amount with companies satisfactory to and as approved by Railroad Company.

- a. Statutory Workers Compensation and Employer's Liability insurance.
- b. Automobile Liability in an amount not less than \$1,000,000 dollars combined single limit.
- c. Comprehensive General Liability (occurrence form) in an amount not less than \$5,000,000 dollars per occurrence, with an aggregate limit of not less than \$10,000,000 dollars. The Policy must name Railroad Company and its Parents as additional insureds in the following form:

Railroad Company name and its Parents  
Attn: Mary Anne Neiner  
17641 South Ashland Avenue  
Homewood, IL 60430  
708.332.3805 (office)  
[MaryAnne.Neiner@cn.ca](mailto:MaryAnne.Neiner@cn.ca)

If the commercial general liability policy required herein contains any exclusions related to doing business or undertaking construction or demolition on, near, or adjacent to railroad facilities; such exclusion must be removed through issuance of endorsement CG 24 17, or a similar endorsement approved by Railroad Company in its sole discretion prior to the commencement of work hereunder.

- d. In the event the privileges provided herein to Licensee involve any work that could result in the discharge, spillage, disposal, release or escape of any Hazardous Material or petroleum product onto the Railroad Company's property, Licensee shall purchase and maintain in effect at all times during the term of this License a Contractor's Pollution Liability policy in an amount not less than two million dollars (\$2,000,000) combined single limit (and with a deductible not to

exceed \$50,000) insuring Railroad against any and all damages, costs, liabilities and expenses resulting from on- or off-site bodily injury (including death to any person), on or off-site loss, damage or destruction of property (including that belonging to the parties hereto), and on-or off-site cleanup costs (including expenses incurred in the investigation, removal, remediation, neutralization, or immobilization of contaminated soils, surface water, groundwater or any other contamination) growing out of or incidental to any discharge, spillage, disposal, release, or escape of any Hazardous Material or petroleum product arising therefrom. For purposes of this Agreement, the term "Hazardous Material" shall include, without limit, any flammable explosives, radioactive materials, hazardous materials, hazardous wastes, hazardous or toxic substances, or related materials defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (42 U.S.C. §§ 9601, et seq.), the Hazardous Material Transportation Act, as amended (49 U.S.C. §§ 1801, et seq.), the Resource Conservation and Recovery Act, as amended (42 U.S.C. §§ 6901 et seq.), the Toxic Substances Control Act, as amended (15 U.S.C. §§ 2601, et seq.), similar laws or ordinances enacted by any state, county or municipality in which the Property is located, or in the regulations adopted and publications promulgated pursuant to any of the above, as such laws or regulations now exist or may exist in the future.

Licensee is required to advise Railroad Company by thirty (30) day advance written notice when any work to be performed under this License may require Pollution Liability Insurance pursuant to the previous paragraph.

Before commencing work, Licensee shall deliver to Railroad Company a certificate of insurance evidencing the foregoing coverage, and upon request, Licensee shall deliver a certified, true and complete copy of the policy or policies at its sole cost and expense. The policies shall provide for not less than thirty (30) days prior written notice to Railroad Company of cancellation of or any material change in, the policies, and shall contain the waiver of right of subrogation.

It is understood and agreed that the foregoing insurance coverage is not intended to, and shall not, relieve Licensee from or serve to limit Licensee's liability under the indemnity provisions of this License or any applicable agreement.

It is further understood and agreed that, so long as this License shall remain in force or until the Licensee's work is complete and Licensee shall have vacated the Railroad Company's property (whichever shall be later), Railroad Company shall have the right, from time to time, to revise the amount or form of insurance coverage provided as circumstances or changing economic conditions may require. Railroad Company shall give Licensee written notice of any such requested change at least thirty (30) days prior to the date of expiration of the then existing policy or policies; and Licensee agrees to, and shall, thereupon provide Railroad Company with certificates reflecting such revised policy or policies thereof.

If a contractor is to be employed by Licensee, then, before any work is commenced hereunder, Licensee shall establish, to the reasonable satisfaction of Railroad Company, that either (i) the contractor has in place insurance policies covering its own work that comply with the required insurance coverages, limits and terms applicable to Licensee, or (ii) the contractor is fully covered under Licensee's insurance policies.

Railroad Company's exercise or failure to exercise any rights under this License shall not relieve Licensee of any responsibility under this License, including, but not limited to, the obligation to indemnify Railroad Company as herein provided.

Cost and expense for work performed by Railroad Company, as referred to in this License, shall consist of the actual cost of labor, materials, equipment and other plus Railroad Company's standard additives in effect at the time the work is performed.

This License is revocable at the option and discretion of Railroad Company upon notice to Licensee, and shall not be transferred or assigned. Unless sooner revoked by Railroad Company, extended at request of Licensee and granted by Railroad Company in writing, or relinquished by act of Licensee, this License shall terminate on \_\_\_\_\_.

Upon termination of this License, Licensee shall remove all of its property, leaving Railroad Company's premises in a neat and safe condition satisfactory to Railroad Company's Engineering Manager or their authorized representative, failing which Railroad Company may remove said materials from its premises at Licensee's sole cost, risk and expense, or at its option, may deem such property as abandoned and henceforth owned by Railroad Company, with no compensation for Licensee whatsoever.

**WISCONSIN CENTRAL LTD.**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

ACCEPTED:

\_\_\_\_\_

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

## SPECIAL PROVISIONS

### RELATIVE TO FLAGGING AND OTHER PROTECTION OF RAILROAD COMPANY TRAFFIC AND FACILITIES DURING CONSTRUCTION ADJACENT AND ABOVE, ON OR ACROSS, THE PROPERTY OF, OR ON, ABOVE AND BENEATH THE TRACKS OF THE WISCONSIN CENTRAL LTD.

The Licensee shall, before entering upon the property of Railroad Company for performance of any work, secure a fully executed right of entry license from Railroad Company's Engineering Manager or their authorized representative for the occupancy and use of Railroad Company's property. Licensee shall confer with Railroad Company relative to requirements for railroad clearances, operation and general safety regulations.

Prior to any entry onto Railroad Company's property, employees and/or contractor(s) of Licensee doing work shall determine by the guidelines hereinafter provided and by the work to be performed the level of safety training to be required.

All employees and/or contractor(s) of Licensee not hired by Railroad Company that will work on CN property are required to have minimum [www.contractororientation.com](http://www.contractororientation.com).

- a. EXCEPTION: Railroad Company has exempted those it classifies as "Delivery Persons" from this training. This will include contractors such as UPS, FedEx, trucking companies, etc. who merely access the property to supply materials or equipment.

All employees and/or contractor(s) of Licensee hired by Railroad Company which will work on Railroad Company property are required to have minimum CN Safety and Security Awareness training, in addition to undergoing a background check. This training and background check must be obtained through the eRailSafe.com website. If not done before, the contractor must contact eRailSafe at 855-383-7434 to be issued a vendor number prior to accessing the noted website. Minimum information required of the Licensee and/or their contractor when contacting e-RailSafe is Name, Address, Telephone, Contact Person for State Projects, DOT Contract Number, and the AAR/DOT Number. This training is good for a period of two years.

- a. EXCEPTION: Railroad Company has exempted those employees of contractors providing paving services at a road crossing under construction or repair from this requirement.
- b. EXCEPTION: Railroad Company has exempted those it classifies as "Delivery Persons" from this training. This will include contractors such as UPS, FedEx, trucking companies, etc. who merely access the property to supply materials or equipment.

All employees and/or contractor(s) of Licensee hired by Railroad Company, whose duties include and who are engaged in the inspection, construction, maintenance, or repair of railroad track, bridges, roadway, signal and communication systems, roadway facilities, or roadway machinery that will work foul of or have the potential to foul a live track are considered Roadway Workers under FRA regulations and CN Policy. They must complete the On-Track Safety Training course approved by Railroad Company and provided by R.R. Safety – AMR, P.O. Box 75, Lomira, WI 53048, telephone (920) 517-1677, email [rrsafetytraining@yahoo.com](mailto:rrsafetytraining@yahoo.com). This training must be repeated at least once each calendar year.

- a. EXCEPTION: Railroad Company has exempted those employees of contractors providing paving services at a road crossing under construction or repair from this requirement.
- b. EXCEPTION: Railroad Company has exempted those it classifies as "Delivery Persons" from this training. This will include contractors such as UPS, FedEx, trucking companies, etc. who merely access the property to supply materials or equipment.
- c. All the employees and/or contractor(s) of Licensee who will operate on-track machinery or those who will provide protection for other employees and/or contractor(s) of Licensee must also be trained on CN US Operating Rules pertaining to their duties. They must take and pass the required examination. This training is good for a period of two years.
- d. "Potential to foul a live track" is considered, at a minimum, to be working within twenty-five feet of the track; or as otherwise to be determined by CN Design & Construction Department.

The employees, contractor(s) , and/or agents of the Licensee and/or its contractor shall qualify for, and make available for inspection to Railroad Company's employees or other authorized personnel at all times while on Railroad Company property, a photo identification issued by [www.e-railsafe.com](http://www.e-railsafe.com), along with at least one other government-issued form of identification. Licensee and/or their contractor shall bear all costs of compliance with the requirements of this Section. Railroad Company reserves the right to bar any of employees or agents of Licensee and/or their contractor from Railroad Company's property at any time for any reason.

Licensee and/or any contractor engaged on their behalf, shall at all times conduct work in a manner satisfactory to the Engineering Manager of Railroad Company, or their authorized representative, and shall exercise care so as to not damage the property of Railroad Company, or that belonging to any other grantees, licensees, permittees or tenants of Railroad Company, or to interfere with railroad operations.

Engineering Manager of Railroad Company, or their authorized representative, will at all times have jurisdiction over the safety of railroad operations., The decision of the Engineering Manager or their authorized representative as to procedures which may affect the safety of railroad operations shall be final, and Licensee and/or their contractor shall be governed by such decision.

All work shall be conducted in such a manner as will assure the safety of Railroad Company. Railroad Company's authorized representative shall have the right, but not the duty, to require certain procedures to be used or to supervise the work on Railroad Company's property.

Should any damage occur to Railroad Company property as a result of the authorized or unauthorized operations of Licensee and/or their contractor and Railroad Company deems it necessary to repair such damage or perform any work for the protection of its property or operations, the Licensee and/or their contractor, as the case may be, shall promptly reimburse Railroad Company for the actual cost of such repairs or work. For the purpose of these Special Provisions, actual cost shall be deemed to include the direct cost of any labor, materials, equipment, or contract expense plus Railroad Company's current standard additives in each instance.

If the work requires the construction of a temporary grade crossing across the track(s) of Railroad Company, Licensee and/or their contractor shall make the necessary arrangements

and execute Railroad Company's temporary grade crossing agreement for the construction, protection, maintenance, and later removal of such temporary grade crossing. The cost of such temporary grade crossing construction and later removal shall be prepaid to Railroad Company. Additional costs for repairs, maintenance or protection will be paid within thirty (30) days upon receipt of bill(s) therefor.

Licensee and/or their contractor shall at no time cross Railroad Company's property or tracks with vehicles or equipment of any kind or character, except at such temporary grade crossing as may be constructed as outlined herein, or at any existing and open public grade crossing. Operation over such crossing shall be at the direction and method of Railroad Company's Engineering Manager or their authorized representative.

Railroad Company may, at Licensee's and/or their contractor's sole cost, risk and expense, furnish whatever protective services it considers necessary, including, but not limited to, flagger(s), inspector(s), and stand-by personnel. Flagging protection, inspection services, or standby personnel required by Railroad Company for the safety of railroad operations because of work being conducted by Licensee and/or their contractor, or in connection therewith, will be provided by Railroad Company and the cost of Licensee and shall be prepaid to Railroad Company by Licensee and/or their contractor. Flagging protection, inspection services, or standby personnel, necessary or provided in excess of prepayment amounts will be billed at the proper rates and will be promptly paid by overnight delivery.

In the event Railroad Company is unable to furnish protective services at the desired time or on the desired date(s), or if Licensee's prepayment for such services is exhausted and not replenished by Licensee and/or their contractor, Licensee and/or their contractor shall not perform any work on Railroad Company's property until such time and date(s) that appropriate Railroad Company services can be made available and/or appropriate prepayment is received. It is understood that Railroad Company shall not be liable for any delay or increased costs incurred by Licensee and/or their contractor owing to Railroad Company's inability or failure to have appropriate protective services available at the time or on the date requested.

Licensee and/or their contractor shall request and secure flagging protection by written notice to Railroad Company using CN's "Request for Flagging Services" form. This form must be submitted at least ten (10) working days in advance of proposed performance of any work or access to Railroad Company's property.

Flagging protection will be required during any operation involving direct and potential interference with Railroad Company's tracks or traffic. This may include but is not limited to fouling of railroad operating clearances, reasonable proximity of accidental hazard to railroad traffic, work within twenty-five (25) feet horizontally of the nearest centerline of any railroad track, any work over any railroad track, or in any other condition that Railroad Company deems protective services necessary, which may include work on or off Railroad Company's property more than twenty-five (25) feet from the nearest centerline of any railroad track, such as any equipment extension (including but not limited to a crane boom) that will reach or has the potential to reach within twenty-five (25) feet of any track.

Licensee and/or their contractor shall request, prepay, and secure Railroad Company signal facility locates by written notice to Railroad Company along with submission of CN's "Request for Flagging Services" form at least ten (10) working days in advance of proposed performance of any work or access to Railroad Company property. Notice to Railroad Company does not fulfill or satisfy any other notification requirements for utility locates for non-railroad facilities.

Railroad Company may require that prior to digging, trenching, or boring activities on or near Railroad Company property, or beneath any railroad track, an on-site meeting be



conducted with Railroad Company's Signal Department representative. No digging, trenching or boring activities shall be conducted in the proximity of any known buried Railroad Company signal cables without Railroad Company's Signal Department representative being present.

The rate of pay for Railroad Company employees will be the prevailing hourly rate for not less than eight (8) hours for the class of labor at regular rates during regularly assigned work hours, and at overtime rates outside of regular hours and in accordance with Labor Agreements or Schedules plus Railroad Company's current standard additives in each instance.

Wage rates are subject to change, at any time, by law or agreement between Railroad Company and employees, and may be retroactive because of negotiations or a ruling by an authorized Governmental Agent. If the wage rates are changed, Licensee and/or their contractor shall pay on the basis of the new rates and/or additives.

No digging, trenching, or boring on Railroad Company property shall be conducted without Railroad Company's written approval of the plans that were furnished to Railroad Company's Engineering Manager at least thirty (30) in advance of the excavation.

The following temporary clearances are the minimum that must be maintained at all times during any operation on or adjacent to Railroad Company property:

- Vertical: 22'-0" (7.00 m) above top of highest rail within 12'-0" (3.81 m) of the centerline of any track
- Horizontal: 12'-0" (3.81 m) from centerline of the nearest track, measured at right angles thereto

If lesser clearances than the above are required for any part of the work, Licensee and/or their contractor shall secure written authorization from Railroad Company's Engineering Manager for such lesser clearances in advance of the start of that portion of the work.

No materials, supplies, or equipment will be stored within twenty-five (25) feet from the centerline of any railroad track, measured at right angles thereto.

Licensee and/or their contractor will be required upon the completion of the work to remove from within the limits of Railroad Company's property all machinery, equipment, surplus materials, false work, rubbish or temporary buildings, and to leave said property in a condition satisfactory to the Engineering Manager of Railroad Company or their authorized representative.

Nothing in these Special Provisions shall be construed to place any responsibility on Railroad Company for the quality or conduct of the work performed by Licensee and/or their contractor hereunder. Any approval given or supervision exercised by Railroad Company hereunder, or failure of Railroad Company to object to any work done, material used, or method of operation shall not be construed to relieve Licensee and/or their contractor of any obligations pursuant hereto or under the License these Special Provisions are appended to.

Accepted: \_\_\_\_\_

Print Name: \_\_\_\_\_

## Request for flagging services Southern Region

TO: CN Date submitted: \_\_\_\_\_  
 Attn: Mary Ellen Carmody, Audit Officer  
 700 Pershing Street  
 Pontiac, Michigan 48340  
 (248) 452-4705  
 maryellen.carmody@cn.ca

FROM: \_\_\_\_\_  
 (Name)

**I am requesting a flagman for the following project. All blanks below must be completely filled in before any flagman request will be honored. Proof of Insurance must accompany this form. Flagman will be provided within five (5) business days, at your cost, depending on availability. Direct your calls concerning availability and problems to (248) 740-6227.**

Project Location: \_\_\_\_\_

RR milepost, Street, etc. \_\_\_\_\_

Company: \_\_\_\_\_

Billing Address: \_\_\_\_\_

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

Company Phone: \_\_\_\_\_ Company Fax: \_\_\_\_\_

\*\*Agreement or Authorization No.: \_\_\_\_\_ Dated: \_\_\_\_\_

With: \_\_\_\_\_

Contractor's Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_

Date(s) Flagging needed: \_\_\_\_\_

Starting time: \_\_\_\_\_ Ending Time: \_\_\_\_\_

Location for flagman to report: \_\_\_\_\_

**Prepayment for WEEKDAY flagman protection is required, and must be submitted by over-night delivery to the address shown at the top of this page. The prepayment amount will be based on the number of weekdays a flagman is required, at the base rate of \$1000.00 per weekday (1-8 hour continuous period). Prepayment for WEEKEND flagman protection will be at the rate of \$150.00 per hour, with an eight hour (8) minimum of \$1,200.00. Any hours in excess of eight (8) continuous hours per flagman on either WEEKDAY or WEEKEND days are to be prepaid at the rate of \$150.00 per hour. Hours of flagman protection provided in excess of prepayment amounts will be billed at the proper rate and will be promptly paid by over-night delivery.**

**If project will run longer than originally anticipated, MaryEllen Carmody must be contacted in advance, and an additional check for the overrun submitted by over-night delivery.**

**Cost for a railroad S&C cable locate is \$250.00, and is to be prepaid by over-night delivery.**

*\*\* You must have an agreement with CN railroad subsidiary, such as a Right of Entry Permit, Formal Agreement or State, County, City Project Number and proof of insurance before you can enter the property.*

Description of work to be performed: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Will you receive State or Federal Funds as reimbursement for this project? Yes \_\_\_ No \_\_\_**

**I agree to pay for flagging services as requested:** \_\_\_\_\_  
*Attach map or other location info and fax completed form with cover letter on your company's letterhead and proof of insurance to MaryEllen Carmody (248) 740-6036.*

[INSERT JPEG IMAGE FOR EXHIBIT A]

# **Final Structure Geotechnical Report**

**for**

**PHASE 2 GRADE SEPARATION  
WASHINGTON STREET IMPROVEMENTS  
HARYAN WAY TO LAKE STREET  
GRAYSLAKE, ILLINOIS LAKE COUNTY  
Section 08-00121-08-WR**

**Prepared for  
LAKE COUNTY DOT**

**PROJECT No. 21150.004**

**MARCH 13, 2012**

**SUBMITTED BY:**



## **1.0 Introduction**

This Structural Geotechnical Report (SGR) has been prepared for the railroad bridge and retaining structures to be constructed along the eastern section of the Washington Street Grade Separation Improvement project.

This Structural Geotechnical Report has been prepared in conjunction with the Roadway Geotechnical Report prepared by Patrick Engineering Inc. (Patrick) dated June 24, 2011, the Phase 1 Structural Geotechnical Report dated July 21, 2011 and Patrick's Phase II Engineering and Environmental Studies for the Washington Street improvements. Patrick's scope of work for the geotechnical investigation was completed as outlined in our proposal to Lake County Division of Transportation (LCDOT) in February 2011.

### 1.1 Project Description

The proposed project consists of a single-span steel girder railroad bridge, which will create a new rail underpass of Washington Street in Grayslake, Illinois. The bridge will be constructed in two stages to allow for continuous operation of the rail track. A shoofly will be constructed at grade about 50 feet east of the existing tracks while the new bridge is constructed. Once the new rail bridge is constructed and rail traffic is routed to its final configuration, the shoofly will be removed and construction of the underpass will be completed.

The main span of the bridge will be supported on approximately 25-foot-tall wall abutments supported on driven steel H-pile foundations. The new bridge will be approximately 102 feet long.

A reinforced concrete cantilever retaining wall will be constructed on the south side of the Washington Street underpass between Station 110+27.87 and Station 122+39.84. The retaining wall will serve as wing walls for the bridge foundation on the south side of the bridge. The retaining wall will extend 540 feet east and 600 feet west of the new bridge.

On either side of the rail bridge, the south retaining wall will be supported on driven steel H-piles (between Stations 114+78.82 and 116+28.82 and between Stations 116+99.86 and 117+89.86). The remainder of the retaining wall will be supported on spread footings (between Stations 110+27.87 and 114+78.82 and between Stations 117+89.86 and 122+39.84).

During excavation of the underpass, Washington Street will be rerouted to a runaround north of the existing alignment. The temporary alignment is approximately 120 feet north of the existing road centerline. This temporary road will be constructed at approximately the existing surface grade; no significant grading will be necessary.

The north side of the underpass will be constructed as an open cut slope. During construction, the slope will be 2.5 horizontal to 1 vertical slope from the bottom of the underpass excavation up to the temporary runaround. After the underpass construction is completed, this slope will be final graded to 3 horizontal to 1 vertical.

## **2.0 Subsurface Investigation**

### 2.1 Soil Borings

Field exploration activities for Phase II were performed the week of November 7, 2011. A total of twelve borings (B-17-11 to B-30-11) were drilled for both sections of the Phase 2 design, including seven borings that were drilled for the railroad bridge and underpass retaining wall. Borings B-17-11 through B-24-11 were located along the retaining wall alignment and ranged in depth from 35 to 100 feet.

Borings B-25-11 through B-30-11 were drilled for the retaining walls on the western end of Washington Street. A separate Structural Geotechnical Report, dated February 16, 2012, was prepared for that portion of the Phase 2 design.

All borings were drilled with a truck-mounted rotary drill rig equipped with hollow-stem augers and an automatic Standard Penetration Test (SPT) hammer. Soil samples were collected every

2.5 feet to a depth of 15 feet and at 5-foot intervals thereafter to the terminal depths of the borings. All samples were collected using either (1) a split-barrel sampler in accordance with the Standard Test Method for Standard Penetration Test and Split-Barrel Sampling of soils (ASTM D 1586) or (2) thin-walled Shelby tubes in accordance with the Standard Practice for Thin-Walled Tube Sampling of soils (ASTM D 1587).

Soil samples from each boring were logged in the field by a Patrick engineering technician. Pocket penetrometer tests and RIMAC tests were performed in the field to estimate unconfined compressive strength on cohesive samples. The samples were then transported to a local laboratory for further inspection and possible testing. The soil samples were classified in the field according to the Standard Practice for Classification of Soils for Engineering Purposes (Unified Classification System) (ASTM D-2487) and the Illinois Department of Transportation (IDOT) IDH Textural Classification Chart.

Where possible, groundwater level observations were made while drilling and immediately after drilling. Most of the borings were backfilled upon completion with soil cuttings and bentonite chips (as needed).

The boring locations are shown on the plan and profile sheets in Appendix A. The boring logs are included in Appendix B.

## 2.2 In situ Groundwater Permeability Testing

Boring B-23-11 was converted into a temporary piezometer to obtain stabilized groundwater measurements after drilling operations and for *in situ* permeability testing. The temporary piezometer consisted of a 2-inch-diameter PVC open standpipe temporary piezometer flush-mounted to the existing pavement. The piezometer in Boring B-23-11 was installed to a depth of 35 feet, with a 10-foot slotted screen between 25 feet and 35 feet. Two additional temporary piezometers were also installed in offset holes immediately adjacent to borings B-23-11 and B-18-11. These temporary piezometers were installed to depths of 18 feet and 25 feet, respectively, with 5-foot- and 10-foot-long well screens.

The piezometers were installed to obtain stabilized groundwater level measurements and *in situ* slug tests were performed on the sand unit at each location. The slug tests were performed to evaluate hydrogeologic conditions at the Site and provide hydrogeologic design parameters for the silt/sand layers at the Site.

### **3.0 Laboratory Testing**

Selected samples from the borings were tested to verify field soil classifications and to determine pertinent geotechnical engineering properties. The laboratory testing program included the following:

- Moisture content determination (ASTM D 2216)
- Atterberg limits (ASTM D 4318)
- Grain size analysis (ASTM D 422)
- Standard Test Methods for Moisture, Ash and Organic Matter of Peat and other Organic Soils (organic content) (ASTM 2974)
- Unconfined compressive strength (ASTM D 2166)
- Unit weight
- Triaxial Shear (ASTM D 4767)
- One-dimensional Consolidation (ASTM D 2435)

All geotechnical laboratory tests were performed in accordance with current ASTM test methods. The test results are shown on the boring logs. Copies of all laboratory reports are also included in Appendix C.

### **4.0 Site Conditions**

#### 4.1 Surface Conditions

Washington Street is currently a two-lane asphalt paved road in a predominantly residential neighborhood. There is an at-grade crossing at the CN railroad tracks near the eastern end of the project area. A sidewalk and overhead power lines run along the southern right-of-way for the majority of the project area. Several utility ducts are present on both the north and south sides of



the road. A lake exists on the north side of the road near Station 78+00 and a marsh is present on the south side; culverts pass beneath the road connecting the lake and marsh.

#### 4.2 Subsurface Conditions

Typically, the borings encountered fill underlain by very stiff clay through the depths explored. Layers of sand and silt were encountered in many of the borings, generally within the upper 15 feet. The conditions were consistent with the Phase 1 soil borings.

The Phase II borings were performed to provide additional soil and groundwater data along the length of the alignment of the proposed underpass retaining wall. These borings also provide additional data for the water bearing sand and silt layers observed in the previously drilled Phase I borings.

Summary descriptions of geotechnical conditions at the proposed Phase II improvements are presented below.

##### *4.2.1 Rail Bridge & Retaining Wall Abutments (B-17-11 to B-24-11)*

Approximately 1 to 2 feet of pavement was encountered at the surface of most of the borings and was underlain by native clays. The pavement generally consisted of approximately 4 to 12 inches of asphalt and up to 20 inches of crushed stone base. Boring B-21-11 was performed off the shoulder of the road and encountered approximately 3 feet of topsoil at the surface.

Below the surficial materials, the borings encountered predominantly stiff to very stiff silty clay through the termination depths of the borings. The native clays had unconfined compressive strength tests ranging from 1 tsf to greater than 5 tsf.

Layers of medium dense silt and silty sand were encountered within the upper 25 feet of each of these borings. These layers generally ranged in thickness from 2 to 6 feet with most between depths of 10 to 20 feet below grade (elevation 778 to 761 feet). These layers are consistent with the silt layers observed in Borings B-13-10 and B-14-10 during the Phase I investigation.

In the temporary piezometers B-18-11 and B-23-11 installed during Phase 2, stabilized groundwater readings were obtained approximately 3 weeks after drilling. At that time, groundwater was observed in the piezometer at B-18-11 location at a depth of 8.7 feet below grade (approximate elevation 784.8 feet). In the piezometers installed in B-23-11 and the offset borehole, groundwater elevations were observed at 11.3 feet (elevation 772.7 feet) and 10.3 feet (elevation 773.7 feet) below grade, respectively. This is consistent with the stabilized groundwater readings obtained in Borings B-1-09 and B-2-09 during Phase 1 which were at depths of 8.4 feet (elevation 780 feet) and 9.3 feet (elevation 776 feet) below grade, respectively. The groundwater elevations observed are consistent between the Phase I and Phase II investigations.

## **5.0 Engineering Analysis and Recommendations**

Geotechnical evaluations and recommendations for the bridge structure, retaining wall and underpass construction are included in the following sections.

### **5.1 Settlement**

The proposed bridge superstructure will be a single-span bridge supported by abutments on the north and south sides of the Washington Street underpass. The bridge is proposed to be founded on driven steel H-piles bearing on glacial till at depths of about 60 to 80 feet below existing grade.

The central section of the proposed retaining wall will be supported on driven piles and end sections will be supported on spread footings. Per the preliminary design, the two types of foundations will not be structurally connected and will be separated by a transitional footing to reduce differential movement between the elements. The driven piles for the retaining wall will bear in the glacial till at depths below 50 feet; therefore, settlement of the pile supported structures is anticipated to be negligible. For the portions of the retaining wall that will be

supported on spread footings, the walls should be designed using an allowable bearing pressure that limits settlement to less than 1 inch.

## 5.2 Slope Stability

A structural retaining wall will be constructed on the south side of Washington Street for the length of the underpass. As the structural wall will be designed to retain the ground on this side, no further slope stability analysis was required.

On the north side of Washington Street, the underpass excavation will initially be built at a temporary 2.5 horizontal to 1 vertical slope. The final slope will be graded to 3 horizontal to 1 vertical from the sidewalk to the final top of slope grade. The deepest portion of the excavation was selected for analysis because it is the most critical area. The analyzed cross-sections were based on Patrick's design plans (dated March 14, 2012).

Patrick used GeoSlope™, a slope stability modeling program, to model the stability of the proposed slope construction for various scenarios and potential design configurations. The two basic scenarios modeled were: 1) temporary construction slope of 2.5H:1V with temporary road (see Figure 1), and 2) permanent slope of 3H:1V (see Figure 2). For the first scenario, a temporary traffic loading at the top of the slope was included for the Washington Street runaround. The slope was analyzed using a live load of 300 psf (for live traffic) in accordance with IDOT recommended procedures. For the second scenario, the traffic load was moved to the base of the slope and the slope grade was modified to the final configuration.

Table 1 summarizes the soil parameters used in the slope stability analyses. These parameters are based on the soil borings, laboratory test results, and reference values.

Table 1. Soil Parameters for Slope Stability Analyses

Material No.	Soil Unit Description	Total Unit Weight (pcf)	Cohesion - c (psf)	Effective Friction Angle - $\phi'$ (degrees)
1	Existing Fill	120	250	0
2	Native Silt	110	0	31
3	Upper Native Clay	135	2000	0
4	Lower Native Clay	135	625	25

Using the GeoSlope™ modeling software, the results of the analyses are shown in Table 2 below. The target factor of safety is 1.5.

Table 2. Slope Stability Analysis Results

Analysis Number	Scenario	Factor of Safety	Notes
1	Scenario 1 During Construction	2.5	Meets minimum FOS
2	Scenario 2 Permanent	2.4	Meets minimum FOS

Copies of the slope stability analyses are included in Appendix D.

### 5.3 Seismic Design Considerations

All of the borings completed during Phase I and II of the project encountered predominantly clay soils; therefore, no liquefaction-related instability or settlement is expected at the site. The soils within the top 100 feet have average normalized undrained shear strength ( $S_u$ ) values of 2.6 tsf, resulting in Seismic Site Class D (IBC 2009). The project site is located within Seismic Performance Zone 1. Additionally, per AREMA 2007 Seismic Design for Railway Structures 1.4.4.1 (Table 9-1-6), a site coefficient of 1.0 is recommended for design of all project structures.

The following Seismic Data were calculated based on the procedures and charts provided in the International Building Code (IBC 2009) and ASCE Standard 7-05:

- Design Spectral Acceleration at 1.0 sec. ( $S_{D1}$ ) = 0.096
- Design Spectral Acceleration at 0.2 sec. ( $S_{D5}$ ) = 0.16

The published maximum considered earthquake spectral response accelerations were determined using a web-based database titled Earthquake Ground Motion Parameters, Version 5.1.0 available from the USGS website. The database provides the maximum earthquake spectral response accelerations for each Site based on longitude and latitude. The site-specific seismic design parameters vary slightly between locations; therefore, the following general seismic design information is recommended.

The Site Coefficients based on the 2009 International Building Code are:

Table 3a: Seismic Design Parameters

	Parameters	Value
<b>Soil Factors using Site Class 'D'</b>	$S_S = 0.292 \text{ g}$	$F_A = 1.567$
	$S_1 = 0.109 \text{ g}$	$F_V = 2.363$
<b>Calculation of <math>S_{DS}</math> and <math>S_{MS}</math></b>	$S_{DS} = 2/3(F_A)(S_S)$	$S_{DS} = 0.305\text{g}$
	$S_{D1} = 2/3(F_V)(S_1)$	$S_{D1} = 0.171\text{g}$

The Site Coefficients based on Section 3 of the AASHTO LRFD Bridge Design Specification, 5th Edition (2010) are:

Table 3b: Seismic Design Parameters

	Parameters	Value
<b>Soil Factors using Site Class 'D'</b>	$PGA = 0.079\text{g}$	$F_{pga} = 1.6$
	$S_S = 0.18 \text{ g}$	$F_A = 1.6$
	$S_1 = 0.065 \text{ g}$	$F_V = 2.4$
<b>Calculation of <math>S_{DS}</math> and <math>S_{MS}</math></b>	$S_{DS} = (F_A)(S_S)$	$S_{DS} = 0.288\text{g}$
	$S_{D1} = (F_V)(S_1)$	$S_{D1} = 0.154\text{g}$
	$PGA_D = (F_{pga})(PGA)$	$PGA_D = 0.126\text{g}$

#### 5.4 Retaining Wall – Soil Design Parameters

The recommended retaining wall systems will be supported by the native very stiff silty clay soils observed in the borings. The following soil parameters for native clays and new engineered fill materials can be used for design of the retaining systems.

**Table 4: Soil Parameters**

	Native Clay	New granular fill
Total Unit weight $\gamma$ (pcf)	135	110
$\phi'$ (degrees)	28	28
$c'$ (psf)	125	n/a
$c$ (psf)	1500	n/a
$K_p$		2.77

The following additional L-pile design parameters can be used for design of temporary sheet pile walls.

**Table 5: Design Parameters**

Elevation	Mod. Subgrade Reaction – k (pci)	L-Pile k (pci)	L-Pile $\epsilon$ 50
740	150	500	0.007
750	125	500	0.007
760	125	1000	0.005

Based on the anticipated groundwater at the Site, Patrick recommends installation of properly designed underdrains behind the retaining walls. These should be connected to the site drainage system for water removal.

### 5.5 Earth Pressures

Walls may be classified as yielding or non-yielding depending on their support conditions. Yielding walls are fixed at the base and move away from the retained soil at their top, allowing active earth pressures to develop. Non-yielding walls do not move and prevent the mobilization of shear strength within the retained soil mass and result in at-rest earth pressure. At-rest earth pressures are greater than active earth pressures. If placement of a floor slab on top of any subsurface walls will prevent wall movement, the subsurface walls should be designed for at-rest pressures.

Table 6 presents equivalent fluid pressures (EFP) for different materials and wall conditions. (Values assume horizontal backfill conditions and no surcharges within the zone of wall influences. If backfill will slope above the wall, higher values will need to be used for design.) The values in this table do not account for hydrostatic pressures and submerged soil weights.

**Table 6: Unfactored Earth Pressures For Wall Backfill**

(no safety factor applied)

Soil/Backfill Type	Total Unit Weight (pcf)	Ka	*EFP Active Condition (pcf)	Ko	*EFP At-Rest Condition (pcf)	Kp	*EFP Passive Condition (pcf)
Native Sand Ø = 36 degrees	120	0.26	31	0.41	49	3.85	462
Crushed Granular, 1.5-Inch FD Ø = 36 degrees	100	0.26	26	0.41	41	3.85	385

\*Does not include surcharge loads that may be present during construction or live operations. Also assumes that material compaction does not increase earth pressure coefficients.

### 5.6 Excavation Rebound

With the anticipated size and depth of the excavation necessary for construction of the underpass, there is a potential for the base of the excavation to experience some amount of upward heave. This rebound, or heave, is the result of the elastic unloading strains experienced due to the relief of pressure on the base soils.

Reference documents sometimes refer to this potential for failure as analogous to a “reverse” bearing capacity failure where the stresses are relieved instead of increased. The potential heave in an excavation is a function of upon the properties of the soil at the base of the excavation in addition to the overall size and depth of the excavation.

Based on the geometry of the proposed underpass, it is considered a “wide excavation.” Using soil parameters obtained from the laboratory test results, along with published data from the United States Army Corps of Engineers, it was determined that for the underpass excavation, the

factor of safety against heave of the base soils would be less than the recommended minimum of 1.5. Therefore, there is potential for some movement at the base of the excavation.

The anticipated soils at the base of the excavation are generally low plasticity, very stiff silty clay glacial till materials. The consolidation test results indicate the glacial till has an over consolidation ratio of 2. Therefore, maximum anticipated heave in the base of the excavation will be on the order of approximately 1 inch. It is anticipated that this heave will occur over a time frame in excess of the construction schedule. This heave should be compensated for during the mass grading and earthwork by removing an additional 1 inch of soil from the base (i.e., deepest portion of excavation beneath bridge superstructure) of the excavation.

## **6.0 Foundation Recommendations**

Geotechnical evaluations and recommendations for the rail bridge and the retaining wall foundations are presented in the following sections.

### 6.1 Rail Bridge

The bridge structure is proposed to be supported on approximately 25-foot-tall wall abutments with driven steel H-piles. The bottom of footing elevation will be at elevation 763.3 feet.

The maximum structural design capacity of the pile and the spacing should be in accordance with AREMA standard practice for rail loads.

For each of the likely steel H-pile sections considered, Table 8 provides allowable load-carrying capacities, including a factor of safety of 2 against bearing failure.



**Table 8: Allowable Bearing Capacities**

Pile Length (feet)	HP10 x 42 (kips)	HP12 x 53 (kips)	HP 14 x 73 (kips)	HP 14 x 89 (kips)
35	120	147	n/a	n/a
40	136	166	n/a	n/a
45	152	185	222	n/a
50	168	205	245	248
60	n/a	n/a	291	294
70	n/a	n/a	337	341
75	n/a	n/a	360	364
80	n/a	n/a	383	387

## 6.2 Retaining Walls

The retaining wall on the south side of Washington Street will be a reinforced concrete cantilever retaining wall. Adjacent to the rail bridge and extending 90 to 150 feet on either side of the bridge, the wall foundation will be supported by driven steel H-piles (between Stations 114+78.82 and 116+28.82 and between Stations 116+99.86 and 117+89.86). Steel H-pile foundations can be designed based on the factored resistance values in Table 9. A typical cross-section of the wall will have a 10-foot-wide concrete pile cap, with the highest point of the wall adjacent to the bridge and bearing at elevation 764.6 feet (approximately 22 feet below existing grade).

The final pile section has not been determined; therefore, the capacity values provided in Table 9 are for likely steel H-sections for various lengths.

**Table 9: Factored Resistance**

Pile Length (feet)	HP10 x 42 (kips)	HP12 x 53 (kips)	HP 14 x 73 (kips)	HP 14 x 89 (kips)
30	138	167	201	204
35	160	193	231	235
40	168	210	262	266
45	168	210	293	297
50	n/a	210	324	329
60	n/a	n/a	386	375

Based on Load Resistance Factored Design approach, the values in Table 9 include a geotechnical resistance factor of 0.5.

The remainder of the retaining wall will be supported on spread footings between Stations 110+27.87 and 114+78.82 and between Station 117+89.86 and 122+39.84. The spread footing bearing elevation will step up incrementally as the excavation becomes shallower and the wall height is reduced. Spread footings bearing on suitable clay soils at these incremental depths can be designed using an allowable bearing pressure of 2,500 psf. Based on this allowable bearing pressure, estimated settlements of the spread footing supported sections of the wall will be less than 1 inch.

## **7.0 Excavations**

### 7.1 Underpass Construction

Construction of the underpass and bridge foundations will require an excavation bracing system for the south side of the road. Based on the anticipated groundwater depth and the water bearing silt and seams within the near surface soils, temporary sheet piling design should consider hydrostatic pressures in addition to the earth pressures.

### 7.2 General Recommendations

Sloped excavations should only be used above the water table and should follow Occupational Safety and Health Administration (OSHA) guidelines. Excavated soil and heavy construction equipment should not be permitted closer to the top of excavation than a distance equal to two times the depth of the excavation in order to reduce the possibilities of slope failure.

Shallow temporary excavations should have a maximum slope of 1 horizontal to 1 vertical (1.0H:1.0V) or flatter as required to provide stable side slopes. Excavations should be accomplished in accordance with OSHA Regulation 1926 Subpart P, Appendix B on “Sloping and Benching.” The bottom of excavations should extend a minimum of 1 foot beyond the plan dimension of the footings to allow for adequate working space.

Construction will likely be accomplished using standard construction equipment. Subgrade exposed to adverse weather and/or construction traffic is likely to soften, requiring improvement before construction of foundations. Site soils may pump and rut under heavy equipment traffic.

### 7.3 Groundwater Control – During Construction

For the excavations that extend below the depth of groundwater observed in the borings, groundwater control will be necessary during construction.

The existing ground surface should be sloped and/or ditches should be provided to prevent precipitation and runoff from entering the foundation excavations during construction. Precautions should be taken by the contractor to prevent raveling or erosion of the exposed cut slopes. Based on the proposed excavation depths and the long term groundwater elevation, dewatering during construction will likely be required.

Based on the *in situ* permeability testing performed in the sand and silt unit, the following minimum and maximum hydraulic conductivity rates should be considered in design of a groundwater control system.

- Soil permeability: 0.15 feet/day (minimum), 1.01 feet/day (maximum)

### 7.4 Long-term Groundwater Control

A long-term groundwater control system will be required for that portion of the underpass structure that extends below the groundwater table. For the underpass to be constructed below the stabilized groundwater elevation subsurface drainage should include pavement underdrains and subsurface wall drains. Underdrains and wall drains should be connected to the site drainage system for water removal.

Sump pits should be installed at the base of the excavation to collect groundwater and surface water runoff in the excavations. Patrick also recommends that all below-grade walls and joints be constructed with water stops and be waterproofed.

Foundation drains should be installed behind the length of the retaining wall.

## **8.0 Construction Considerations**

### **8.1 Site Preparation**

Existing pavement materials should be removed within the footprint of the walls and properly disposed. The ground surface shall be cleared of any remaining vegetation and loose debris. The ground surface shall be firm prior to placement of additional fill material. Any unstable or unsuitable materials should be removed and replaced with compacted structural fill.

### **8.2 Existing Utilities**

The potential effect of ground movements upon nearby utilities should be considered during construction. Temporary excavations required for foundation construction should have a slope or temporary support system as required to provide a stable excavation. The Contractor should ensure there are no utility conflicts with the final design and construction program.

### **8.3 Filling and Backfilling**

Embankment fill materials required to attain the final design subgrade elevations should be in accordance with Section 205 of the IDOT Standard Specifications. All fill and backfill materials should be pre-approved by the site engineer. Fill should be free of organic materials and debris.

Structural fill used at the Site should be approved inorganic soil, free of waste, debris, deleterious material, and excess moisture. Structural fill should be placed where dry and stable conditions exist at design or undercut subgrade.

Fill used at the Site should meet the following minimum requirements.

1. Contain no more than 5% organic materials when tested in accordance with ASTM D 2974.
2. Free of organic and other deleterious material, have a maximum particle size of 3 inches, and a liquid limit of less than 45 and a plasticity index less than 25.

3. Soils classified as A-1, A-2, A-3 and A-6, per IDH textural classification, are generally suitable for roadway subgrade.
4. Soils classified as A-4, A-5 and A-7 should be considered unsuitable.
5. Structural fill should be placed in maximum 8-inch thick loose lifts and compacted at moisture contents within  $\pm 3\%$  of optimum to a minimum 95% of maximum dry density per modified Proctor (ASTM D-1557).
6. General site fill should consist of free-draining granular material (less than 8 percent fines) placed in maximum 10-inch-thick loose lifts and compacted to a minimum 95% of maximum dry density per standard Proctor (ASTM D 698) to improve material density through particle interlock.

Granular fill may consist of locally available crushed limestone, crushed gravel with sand, or recycled concrete meeting the gradation limits provided in Table 10. Where wet conditions are encountered, free-draining crushed limestone similar to the free draining 1.5- inch gradations in Table 10 should be used.

**Table 10: Coarse Aggregate Gradations**

Gradation (% Passing)	Sieve Size ▶	3"	2.5"	2"	1.5"	1"	0.5"	No. 4	No. 16	No. 200*
	3-inch		10 0	95± 5	60±1 5	15±1 5	3±3			
1.5-inch					100	95± 5	75±5	43±1 3	25±15	8±4
1.5-inch FD					100	95± 5	45±1 5	5±5		

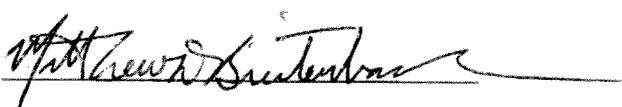
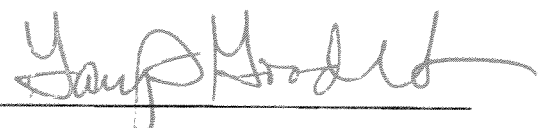
FD – free draining

**9.0 Limitations**

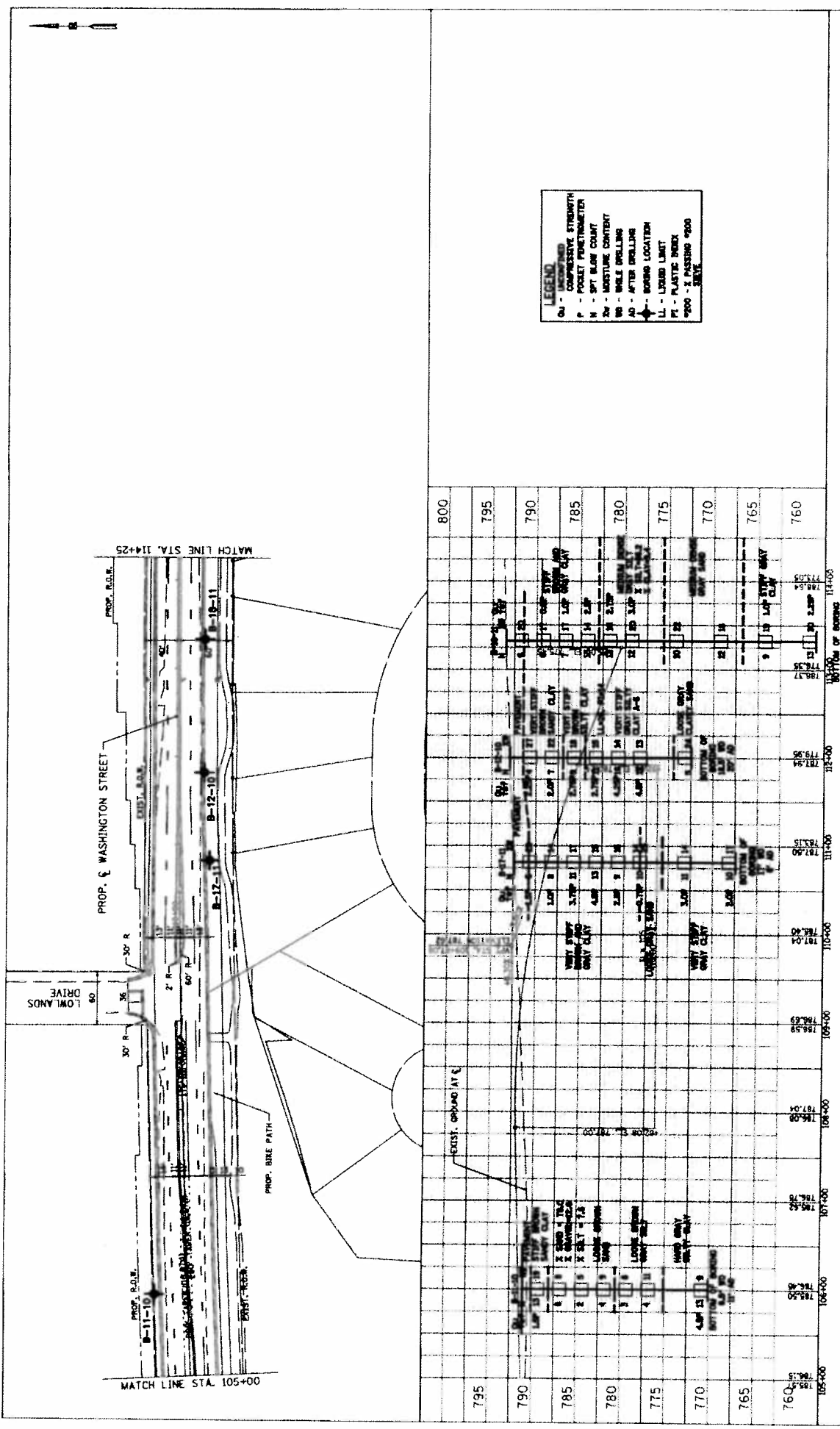
The recommendations contained in this report are based on the soils encountered at the boring locations at the time of our borings. Should conditions encountered during excavation and construction operations differ from those encountered in the borings, Patrick should be notified so that the recommendations can be reviewed and revised if necessary.

This investigation was performed in accordance with accepted geotechnical engineering practices for determining soil conditions and preparing recommendations for the referenced site improvements only. Verification of the subsurface conditions for purposes of determining the extent of contaminated soils or contaminated groundwater, difficulty of excavation, and trafficability is beyond the scope of this investigation. In the event that any changes in the nature, design or location of the proposed construction are made, the conclusions and recommendations contained in this report should not be considered valid until the changes are reviewed and the conclusions and recommendations in this report have been modified or verified in writing.

This report is for the exclusive use of the Client and no one else without written consent from Patrick Engineering Inc.

<p>Report Prepared by:</p>  <p>Matthew D. Breitenbach, P.E. Project Geotechnical Engineer</p>	<p>Report Reviewed by:</p>  <p>Gary F. Goodheart, P.E. Senior Program Director</p>
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**PLAN AND PROFILE SHEETS**



**LEGEND**

- OU - UNSATURATED
- CS - COMPRESSIVE STRENGTH
- P - POKET PENETROMETER
- N - SPT BLOW COUNT
- Mo - MOISTURE CONTENT
- AD - AFTER DRILLING
- LO - BORING LOCATION
- LL - LIQUID LIMIT
- PI - PLASTIC INDEX
- 900 - 2 PASSING #200 SIEVE

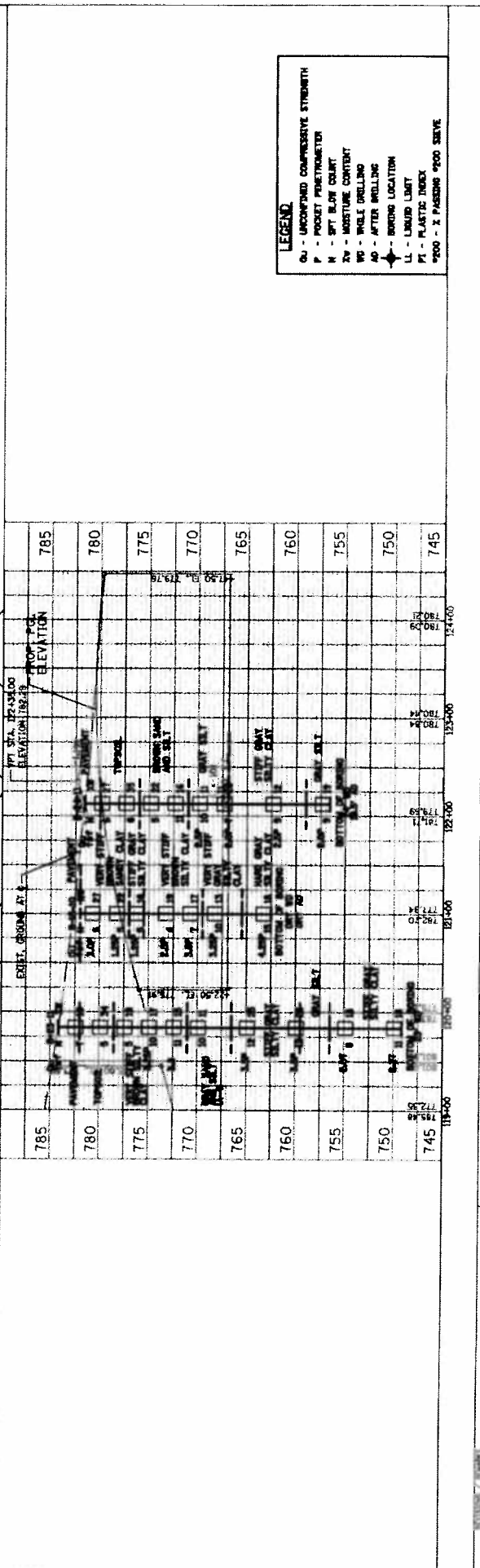
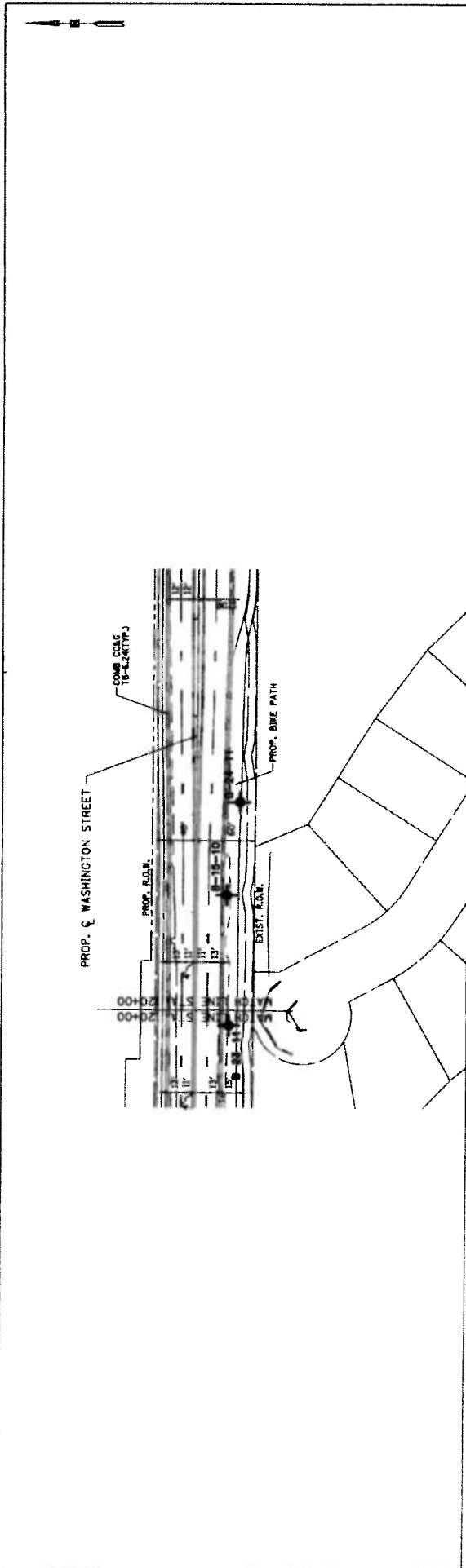
DATE	BY	SCALE	SECTION	ROUTE	SECTION	SECTION NUMBER	SHEET	SHEETS
10/15/2011	JL	1" = 40'	---	A22	---	08-00121-09-WR	4	7
WASHINGTON STREET PLAN & PROFILE STA. 105+00 TO STA. 120+00			Lake County DEPT. OF TRANSPORTATION					

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**LEGEND**

- CU - UNCOMPACTED COMPRESSIVE STRENGTH
- P - POCKET PENETROMETER
- M - SPT BLOW COUNT
- TM - MOISTURE CONTENT
- WD - WHEEL DRILLING
- AD - AFTER DRILLING
- ★ - BORING LOCATION
- LL - LIQUID LIMIT
- PI - PLASTIC INDEX
- 9000 - X PASSING #200 SIEVE

DATE: 08/12/08	SCALE: 1" = 20'	PROJECT: WASHINGTON STREET	ROUTE: A22	SECTION: ---	SECTION NUMBER: 08-001.21-08-WR	SHEET: 7	SHEETS: 7
LAKELAND ENGINEERING & SURVEYING, INC.			LAKELAND ENGINEERING & SURVEYING, INC.				
1111 W. WASHINGTON STREET, SUITE 100, TAMPA, FL 33606			1111 W. WASHINGTON STREET, SUITE 100, TAMPA, FL 33606				
TEL: 813-288-1111			TEL: 813-288-1111				
FAX: 813-288-1112			FAX: 813-288-1112				
WWW.LAKELANDENGINEERING.COM			WWW.LAKELANDENGINEERING.COM				
LAKELAND ENGINEERING & SURVEYING, INC.			LAKELAND ENGINEERING & SURVEYING, INC.				
A PROFESSIONAL ENGINEERING FIRM			A PROFESSIONAL ENGINEERING FIRM				
LICENSE NO. 12573			LICENSE NO. 12573				
FLORIDA REGISTERED PROFESSIONAL ENGINEER			FLORIDA REGISTERED PROFESSIONAL ENGINEER				
DATE: 08/12/08			DATE: 08/12/08				
DRAWN BY: J. W. WILSON			DRAWN BY: J. W. WILSON				
CHECKED BY: J. W. WILSON			CHECKED BY: J. W. WILSON				
PROJECT: WASHINGTON STREET			PROJECT: WASHINGTON STREET				
ROUTE: A22			ROUTE: A22				
SECTION: ---			SECTION: ---				
SECTION NUMBER: 08-001.21-08-WR			SECTION NUMBER: 08-001.21-08-WR				
SHEET: 7			SHEET: 7				
SHEETS: 7			SHEETS: 7				

**BORING LOGS  
SOIL DESCRIPTION TERMINOLOGY EXHIBIT  
AND ASFE FACT SHEET**

Patrick Engineering Inc.  
STRUCTURE BORING LOG

ROUTE A22 DESCRIPTION Washington Street Phase II 21150.004

SECT. 08-00121-08-WR STRUCT. NO. \_\_\_\_\_ DRILLED BY Groff Testing

COUNTY Lake LOCATION Grayslake, IL S. 27 , TWP. 45N , RNG. 10E

Boring No. <u>B-17-11</u>	D	B	L	O	S	Qu	W	Surface Water Elev. _____	D	B	L	O	S	Qu	W
Station <u>110+75</u>	E	B	L	O	S	tsf	%	Groundwater Elev.: _____	E	B	L	O	S	tsf	%
Offset <u>20.00ft R</u>	P	B	L	O	S			when drilling <u>775.5</u>	P	B	L	O	S		
Surface Elev. <u>792.50</u> ft	T	B	L	O	S			at Completion <u>784.5</u>	H	B	L	O	S		
	H	S						after _____ Hrs.							
12" asphalt								End of Boring at 25.0'							
791.50															
12" CA-6 base course		5				1.5*	28								
790.50		3													
Stiff brown silty clay, with organics, moist		3													
789.50															
Stiff brown silty clay, moist															
787.00		4				1.0*	14								
Very stiff brown/gray silty clay, some medium sand, moist		4													
782.00		5													
Very stiff gray silty clay, some medium to coarse sand, trace fine gravel, moist		6													
778.50		4				4.38	15								
Loose gray fine to coarse sand, wet		6													
775.50		4				2.77	15								
Very stiff gray silty clay, some medium to coarse sand, trace fine gravel, moist		5													
767.50		6													
		3				2.93	17								
		4													
		6													

\*qu values determined using pocket penetrometer

SPT. (N) = Sum of last two blow values in sample. (Qu) B=Bulge S=Shear P=Penetration Test Stations, Depths, Offset, and Elevations are in Feet

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Patrick Engineering Inc.  
STRUCTURE BORING LOG

ROUTE A22 DESCRIPTION Washington Street Phase II 21150.004  
 SECT. 08-00121-08-WR STRUCT. NO. \_\_\_\_\_ DRILLED BY Groff Testing  
 COUNTY Lake LOCATION Grayslake, IL S. 22 , TWP. 45N , RNG. 10E

Boring No. <u>B-21-11</u>	D	B	L	O	W	Qu	W	Surface Water Elev. _____	D	B	L	O	W	Qu	W
Station <u>116+50</u>	P	L	O	W	S	tsf	%	Groundwater Elev.: _____	T	L	O	W	S	tsf	%
Offset <u>30.00ft L</u>								at Completion _____							
Surface Elev. <u>788.50</u> ft	H	S						after _____ Hrs. _____	H	S					
Stiff black topsoil															
		3			NP	31									
		4													
		5													
<u>785.50</u>															
Medium stiff brown and gray silty clay, some medium sand, moist		3				19				2			2.11	16	
		3								4					
	-5	3								5					
<u>781.50</u>		2			2.0*	14									
Brown and gray silt, wet		2													
		3													
<u>780.50</u>															
Stiff brown and gray silty clay, moist		3			1.0*	17				2			2.27	18	
		4								4					
<u>779.00</u>		6								5					
Very stiff gray silty clay, trace sand, moist	-10														
<u>778.00</u>															
Medium dense gray silt, wet A-4		4			2.0*	22									
		5													
		8													
<u>773.90</u>		4			3.5*	19				2			2.5*	14	
Very stiff gray silty clay, trace medium sand, moist		5								4					
	-15	6								5					
<u>746.70</u>															
Hard gray silty clay, some medium sand, moist		2			3.1	15				3			4.88	18	
		4								5					
	-20	5								7					
<u>742.00</u>															
Very stiff gray silty clay, moist A-6															
<u>766.00</u>		2			1.65	18				3			2.15	19	
Very stiff gray silty clay, trace medium sand, moist		3								4					
		3								5					
	-25														

SPT. (N) = Sum of last two blow values in sample. (Qu) B=Bulge S=Shear P=Penetration Test Stations, Depths, Offset, and Elevations are in Feet

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Patrick Engineering Inc.  
STRUCTURE BORING LOG

A22  
08-00121-08-WR  
Lake

A22  
08-00121-08-WR  
Lake

Boring No.	Station	Offset	DEPTH	BLOWS	Qu tsf	W %		DEPTH	BLOWS	Qu tsf	W %
B-21-11	116+50	30.00ft L									
			738.50 ft					713.50 ft			
				2	2.48	18			3	2.46	18
				3					5		
			-55	6				708.50	8		
				3	3.72	17			5	3.39	16
				4					6		
			-60	6				-85	9		
			726.00								
				4	2.52	13			5	4.01	15
				5					9		
			-65	9				-90	14		
				5	5.21	15			6	4.75	14
				9					8		
			-70	12				-95	13		
				WOH	1.0*	17			7	6.36	14
				3					15		
			-75	7				688.50	16		

Very stiff to hard gray silty clay, trace medium sand, moist

Very stiff gray silty clay, trace medium to coarse sand, moist

\*qu values determined using pocket penetrometer

SPT. (N) = Sum of last two blow values in sample. (Qu) B=Bulge S=Shear P=Penetration Test Stations, Depths, Offset, and Elevations are in Feet

Patrick Engineering Inc.  
STRUCTURE BORING LOG

ROUTE A22 DESCRIPTION Washington Street Phase II 21150.004  
 SECT. 08-00121-08-WR STRUCT. NO. \_\_\_\_\_ DRILLED BY Groff Testing  
 COUNTY Lake LOCATION Grayslake, IL S. 27, TWP. 45N, RNG. 10E

Boring No.	Station	Offset	Surface Elev.	DEPTH	BLOWS	Qu tsf	W %	Surface Water Elev.	Groundwater Elev.:	when drilling	at Completion	after	Hrs.	DEPTH	BLOWS	Qu tsf	W %	
B-22-11	118+25	20.00ft R	787.00 ft								763.5							
10" CA-6 base course				786.20														
Stiff black topsoil					3 5 5	NP	11								P U S H		17	
Stiff brown silty clay, with organics, moist				782.50	3 3 4	2.0*	31								3 4 6	3.31	19	
Hard brown and gray silty clay, moist				780.50	3 4 5	4.75	17											
					5 7 9	5.45	16								3 4 6	3.39	18	
Stiff gray silty clay, moist				775.00	5 5 6	3.14	14											
Medium dense brown sand				773.00	5 7	NP	17								3 5	3.02	21	
Medium dense gray silt, moist A-4				772.20	8							747.00			6			
End of Boring at 40.0'																		
*qu values determined using pocket penetrometer																		
Medium dense brown medium to coarse sand, moist				768.00	3 7 8	NP	13											
Very stiff gray silty clay, some medium sand, moist A-6				765.20														
					1 2 3	2.07	18											

SPT. (N) = Sum of last two blow values in sample. (Qu) B=Bulge S=Shear P=Penetration Test Stations, Depths, Offset, and Elevations are in Feet

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Patrick Engineering Inc.  
STRUCTURE BORING LOG

ROUTE A22 DESCRIPTION Washington Street Phase II 21150.004  
 SECT. 08-00121-08-WR STRUCT. NO. \_\_\_\_\_ DRILLED BY Groff Testing  
 COUNTY Lake LOCATION Grayslake, IL S. 27 , TWP. 45N , RNG. 10E

Boring No. <u>B-23-11</u>	D E P T H	B L O W S	Qu tsf	W %	Surface Water Elev. _____ Groundwater Elev.: _____ when drilling <u>761.0</u> at Completion _____ after <u>504</u> Hrs. <u>772.7</u>	D E P T H	B L O W S	Qu tsf	W %
Surface Elev. <u>784.00</u> ft									
<u>5" asphalt</u> _____ <u>783.60</u>					wet				
<u>19" CA-6 base course</u> _____									
_____ <u>782.00</u>		6	1.25*	10					
<u>Brown/black silty clay, moist</u> _____		4							
_____ <u>781.00</u>		3			<u>Stiff gray silty clay, moist</u> _____ <u>756.50</u>				
<u>Stiff black topsoil</u> _____									
_____		3	NP	34			2	2.07	18
_____		2					4		
_____ <u>778.50</u>		3					4		
<u>Soft brown silty clay, moist</u> _____									
_____		1	NP	19					
_____		2							
_____ <u>776.10</u>		3							
<u>Very stiff brown silty clay, trace sand, moist</u> _____									
_____		2	3.25*	17			3	2.27	18
_____		4					5		
_____ <u>749.00</u>		6			<u>End of Boring at 35.0'</u>		6		
<u>Medium dense gray fine to coarse sand and silt, moist A-4</u> _____									
_____		3	3.8	15					
_____		5							
_____ <u>771.00</u>		6			*qu values determined using pocket penetrometer				
<u>Very stiff gray silty clay, moist</u> _____									
_____		4	NP	11					
_____		6							
_____ <u>766.50</u>		4							
<u>Very stiff gray silty clay, moist</u> _____									
_____		3	3.5*	25					
_____		5							
_____ <u>759.50</u>		7							
<u>Medium dense gray silt,</u> _____									
_____		2	3.5*	25					
_____		5							
_____ <u>759.50</u>		7							

SPT. (N) = Sum of last two blow values in sample. (Qu) B=Bulge S=Shear P=Penetration Test Stations, Depths, Offset, and Elevations are in Feet

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# Patrick Engineering Inc. STRUCTURE BORING LOG

ROUTE A22 DESCRIPTION Washington Street Phase II 21150.004  
 SECT. 08-00121-08-WR STRUCT. NO. \_\_\_\_\_ DRILLED BY Groff Testing  
 COUNTY Lake LOCATION Grayslake, IL S. 27 , TWP. 45N , RNG. 10E

Boring No. <u>B-24-11</u>	D E P T H	B L O W S	Qu tsf	W %	Surface Water Elev. _____	D E P T H	B L O W S	Qu tsf	W %
Station <u>122+00</u>					Groundwater Elev.: _____				
Offset <u>25.00ft R</u>					when drilling <u>757.5</u>				
Surface Elev. <u>781.50</u> ft					at Completion <u>762.0</u>				
					after _____ Hrs.				
<u>4" asphalt</u> / <u>781.20</u>					End of Boring at 25.0'  *qu values determined using pocket penetrometer				
<u>14" CA-6 base course</u> <u>780.00</u>		3	NP	27					
<u>Stiff black topsoil</u>		3							
		3							
		2	NP	35					
		3							
		3							
<u>Loose brown and gray silt and fine sand, moist</u> <u>776.00</u>		2	NP	22					
		3							
		2							
<u>Medium dense brown sand, moist</u> <u>773.50</u>		3	NP	16					
		4							
		7							
<u>Medium dense gray silt, moist</u> <u>771.00</u>		3	2.5*	11					
		4							
		6							
<u>Very stiff gray silty clay, some sand, moist</u> <u>767.00</u>		3	2.0*	11					
		3							
		4							
		3	3.97	12					
		4							
		5							
<u>Medium dense brown and gray silt, moist</u> <u>759.00</u>		3	2.0*	19					
		4							
		5							

SPT. (N) = Sum of last two blow values in sample. (Qu) B=Bulge S=Shear P=Penetration Test  
 Stations, Depths, Offset, and Elevations are in Feet

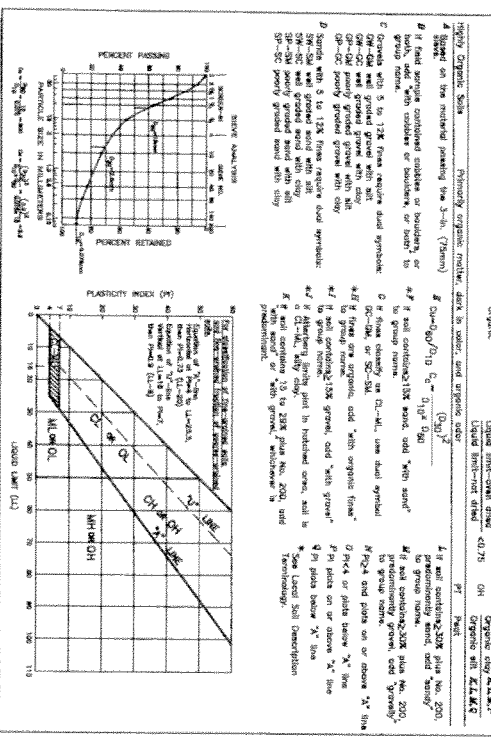
527

# UNIFIED SOIL CLASSIFICATION SYSTEM

TABLE 1 SOIL CLASSIFICATION CHART

Check for Assigning Group Symbols and Group Names Using Laboratory Tests A

Soil Classification	Group	Group Name B
Clayey Gravel	GM	Medium-dense gravel
	GC	Dense gravel
Sandy Gravel	GW	Very dense sand
	GW-GC	Dense sand
Sandy Silty Clay	SM	Medium-dense sand
	SC	Dense sand
Silty Clay	ML	Medium-dense sand
	CL	Dense sand
Silty Sand	SM	Medium-dense sand
	SC	Dense sand
Sand	SW	Very dense sand
	SW-GC	Dense sand
Silt	ML	Medium-dense sand
	CL	Dense sand
Clay	ML	Medium-dense sand
	CL	Dense sand



## ABBREVIATIONS USED ON BORING LOG

- ALU - Sample from Auger
- ST - Thompson Sampler, ASTM D 1586
- CA - Continuous Flight Auger
- MA - Hand Auger
- BSA - Hollow Stem Continuous Flight Auger
- S - Bag Sample from Test pit, Excavation, etc.
- BX - Rock Core 1-1/8" Diameter
- DK - Rock Core 2-1/8" Diameter
- OD - Coring Diameter
- LD - Inside Diameter
- SPT - Standard Penetration Test, ASTM D 1586
- WGR - Weight of Hammer
- LI - Penetration Index, ASTM D4518

# PATRICK ENGINEERING INC.

## LOCAL SOIL DESCRIPTION TERMINOLOGY

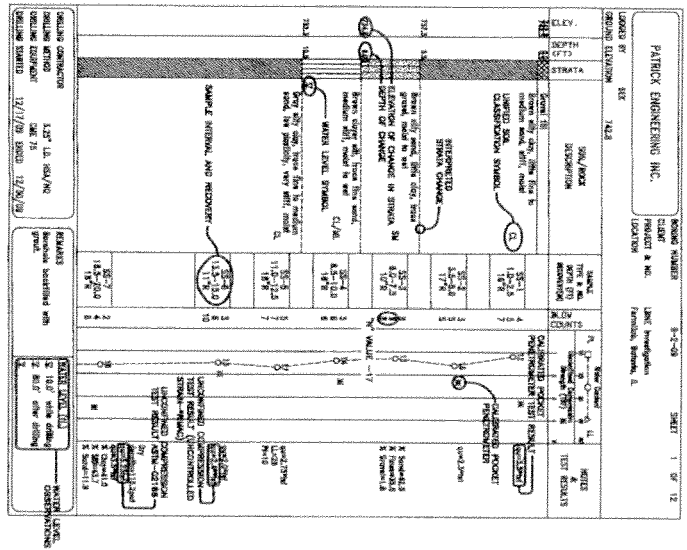
Soils are typically identified and classified on the boring log and described in this report according to the Unified Soil Classification System with the following modifications:

RELATIVE DENSITY OF GRANULAR SOILS	CONSISTENCY OF COHESIVE SOILS
Very Loose	Very Soft
Loose	Soft
Medium Dense	Medium Stiff
Dense	Hard
Very Dense	Very Stiff
Extremely Dense	Hard

\* N (blows/foot) are based on field measurements and not corrected.

RELATIVE PLASTICITY	SOIL MOISTURE
High	Dry to touch, damp, no visible water
Medium	Moist - Moist to touch, damp, no visible water
Low	Wet - The water table is usually below
>50	Saturated - Free Water in Sample

## EXAMPLE BORING LOG



## GRAPHIC LOG SYMBOLS (OPTIONAL)

Asphalt	Concrete	Coal	Poily Gravel (SP)
Well Grated Sand (SW)	Gravel (GP)	Gravel (GW)	Silty Sand (SM)
Sand (SC)	Clayey Gravel (GC)	Silty Gravel (GM)	Silt (ML)
Embankment (EM)	Silty Clay (CL-ML)	Low Plasticity Clay (CL)	High Plasticity Clay (CH)
Low Plasticity Clay (OL)	High Plasticity Clay (OH)	Low Plasticity Clay (CL)	High Plasticity Clay (CH)
Fill	Limestone	Shell	Sandstone
Diabase	Siltstone	Boulders	Cobbles

## WATER LEVEL SYMBOLS

- Water Level, During Drilling
- Water Level, After Drilling
- Water Level, After 24 Hours

## SOIL COLORS

- Abbreviations for colors vary between loggers. In general the following abbreviations are used:
- BLK = Black
- BRN = Brown
- GRY = Gray
- GRN = Green
- ORG = Orange
- PK = Pink
- STR = Strong
- WH = White
- YEL = Yellow

## ROCK QUALITY DESIGNATION

The Rock Quality Designation (Deere, et al., 1989) method of determining rock quality as reported here was obtained by summing up the total length of cores recovered in each run, counting only those pieces of core which are four inches (10 cm) in length or longer and which are found and sound. The sum is then expressed as a percentage of the length of the run. If the core is broken by handling or the use of a core bucket, the length of the core is fitted together and counted as one piece provided that they form the requisite length of four inches (10 cm). RQD is reported as a percentage.

RQD (%)	Description of Rock Quality
0 - 25 <td>Very Poor</td>	Very Poor
25 - 50 <td>Poor</td>	Poor
50 - 75 <td>Fair</td>	Fair
75 - 90 <td>Good</td>	Good
90 - 100 <td>Excellent</td>	Excellent

## SOIL

## DESCRIPTION TERMINOLOGY

UNIFIED SOIL CLASSIFICATION SYSTEM  
KEY TO GRAPHIC LOG SYMBOLS  
KEY TO ROCK CORE DATA  
EXAMPLE BORING LOG

# Important Information about Your Geotechnical Engineering Report

*Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.*

*While you cannot eliminate all such risks, you can manage them. The following information is provided to help.*

## **Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects**

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

## **Read the Full Report**

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

## **A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors**

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

## **Subsurface Conditions Can Change**

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. Always contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.*

## **Most Geotechnical Findings Are Professional Opinions**

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

## **A Report's Recommendations Are Not Final**

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

### **A Geotechnical Engineering Report Is Subject to Misinterpretation**

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

### **Do Not Redraw the Engineer's Logs**

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

### **Give Contractors a Complete Report and Guidance**

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time to perform additional study.* Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

### **Read Responsibility Provisions Closely**

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

### **Geoenvironmental Concerns Are Not Covered**

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

### **Obtain Professional Assistance To Deal with Mold**

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

### **Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance**

Membership in ASFE/The Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

## **ASFE THE GEOPROFESSIONAL BUSINESS ASSOCIATION**

8811 Colesville Road/Suite G106, Silver Spring, MD 20910

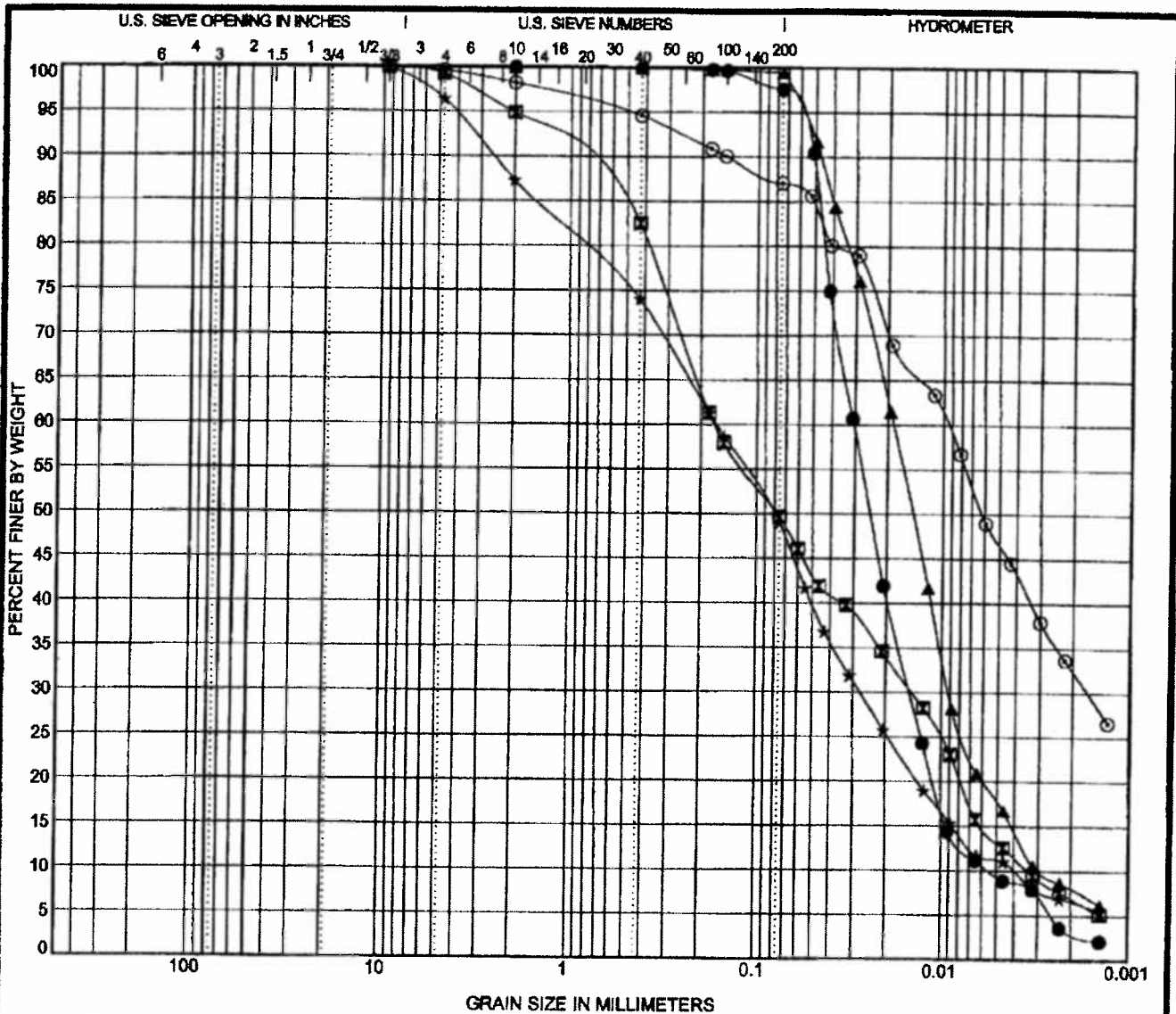
Telephone: 301/565-2733 Facsimile: 301/589-2017

e-mail: [info@asfe.org](mailto:info@asfe.org) [www.asfe.org](http://www.asfe.org)

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## **LABORATORY TEST RESULTS**





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	USCS Classification	LL	PL	PI	Cc	Cu
● B-18# 11.0 ft					1.32	5.57
■ B-19# 23.5 ft					0.36	49.27
▲ B-21# 11.0 ft					1.55	6.42
★ B-23# 13.5 ft					1.14	40.54
◎ B-25# 11.0 ft						

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-18# 11.0 ft	2	0.03	0.015	0.005	0.0	2.4	88.2	9.4
■ B-19# 23.5 ft	9.5	0.168	0.014	0.003	0.8	49.6	36.3	13.4
▲ B-21# 11.0 ft	2	0.019	0.009	0.003	0.0	0.5	81.7	17.8
★ B-23# 13.5 ft	9.5	0.164	0.027	0.004	3.6	47.4	37.8	11.2
◎ B-25# 11.0 ft	9.5	0.009	0.002		0.4	12.5	40.4	48.7



Wang Engineering, Inc.  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

**GRAIN SIZE DISTRIBUTION**  
 Project: Washington Street  
 Location: Grayslake, IL  
 Number: 190-27-12

WEI GRAIN SIZE USCS 1902712.GPJ US LAB.GDT 11/28/11

532



## LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX

AASHTO T 89, T 90 / ASTM D 4318

Client: Patrick Engineering, Inc.

Analyst name: C. Iordache

Project: Washington Street

Test date: November 21, 2011

WEI Job No: 190-27-12

Soil Sample: B-21 (48.5-50.0 ft)

Prep Method: air dried

Sample description: Gray Lean Clay

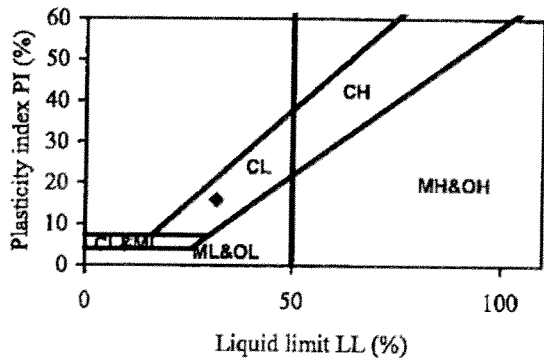
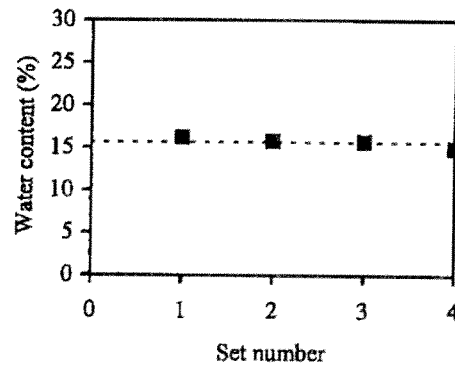
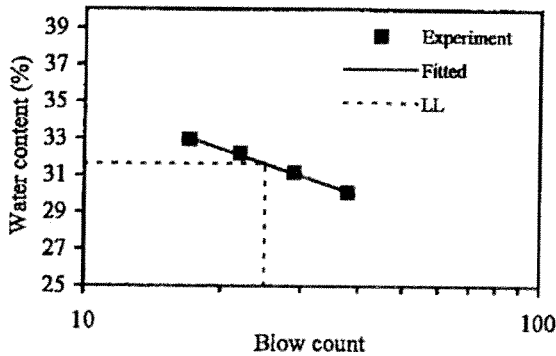
% retained on #40 sieve: 13%

Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	11.12	24.88	21.70	38	30.06	30.12
2	11.08	25.19	21.84	29	31.13	31.09
3	11.13	25.30	21.85	22	32.18	32.08
4	11.28	24.04	20.88	17	32.92	33.00

Liquid limit (%) = 31.62  
Slope of flow line = 0.114

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	11.44	20.13	18.92	16.18
2	11.31	20.80	19.51	15.73
3	11.19	21.43	20.04	15.71
4	11.33	21.24	19.95	14.97

Plastic limit (%) = 15.64



Liquid limit (%) = 32  
Plastic limit (%) = 16  
Plasticity index (%) = 16

Prepared by: M. de la Cruz Reyes Date: 11/28/11  
Checked by: AF Date: 11/28/11

**WANG ENGINEERING, INC.**

1145 N. Main Street, Lombard, IL 60148



## LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX

AASHTO T 89, T 90 / ASTM D 4318

Client: Patrick Engineering, Inc.  
 Project: Washington Street  
 WEI Job No: 190-27-12  
 Prep Method: air dried

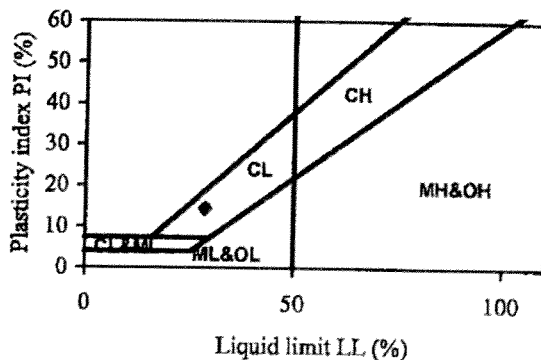
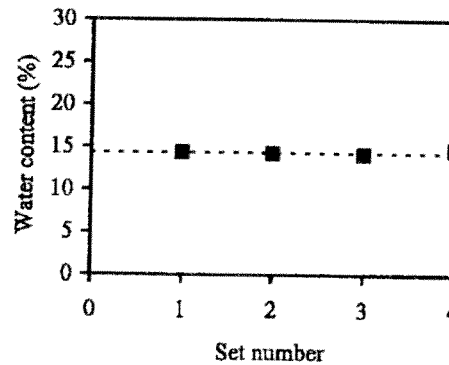
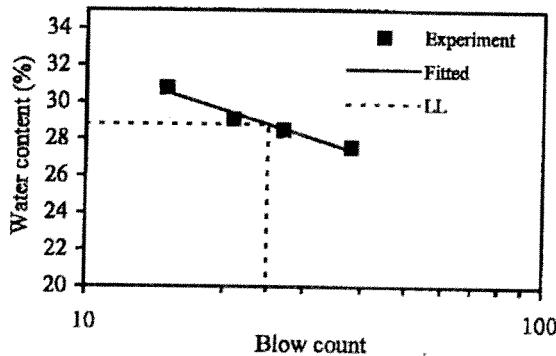
Analyst name: C. Iordache  
 Test date: November 21, 2011  
 Soil Sample: B-22 (23.5-25.0 ft)  
 Sample description: Gray Lean Clay with Silt  
 % retained on #40 sieve: 10%

Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	11.08	26.77	23.38	38	27.56	27.40
2	11.45	26.65	23.28	27	28.49	28.55
3	11.01	25.44	22.19	21	29.07	29.39
4	11.26	26.27	22.74	15	30.75	30.52

Liquid limit (%) = 28.81  
Slope of flow line = 0.115

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	11.03	20.81	19.58	14.39
2	11.29	20.97	19.76	14.29
3	11.20	22.89	21.44	14.16
4	11.06	24.74	22.98	14.77

Plastic limit (%) = 14.40



Liquid limit (%) = 29  
 Plastic limit (%) = 14  
 Plasticity Index (%) = 14

Prepared by: M. de la Cruz Date: 11/28/11  
 Checked by: A.L. Date: 11/28/11

**WANG ENGINEERING, INC.**  
 1145 N. Main Street, Lombard, IL 60148



## DENSITY-UNIT WEIGHT DETERMINATION

Client: Patrick Engineering, Inc.  
 Project: Washington Street  
 WEI Job No: 190-27-12

Analyst name: C. Iordache  
 Test date: 11/18/2011

	B-17 (11.0-12.5 ft)	B-21 (38.5-40.0 ft)	B-21 (73.5-75.0 ft)	B-22 (33.5-35.0 ft)
<b>Water content determination</b>				
Mass of tare and wet soil (g) $W_w =$	70.80	69.79	73.52	71.26
Mass of tare and dry soil (g) $W_d =$	63.90	60.54	63.67	61.90
Mass of tare (g) $W_t =$	11.38	11.39	11.17	11.05
Water content $w =$	13%	19%	19%	18%

**Density-Unit Weight**

Diameter measurements (in) $D_1 =$	1.359	1.407	1.380	1.411
$D_2 =$	1.412	1.434	1.429	1.415
$D_3 =$	1.400	1.444	1.428	1.417
Average diameter (in) $D =$	1.390	1.428	1.412	1.414
Height measurements (in) $H_1 =$	1.052	1.064	1.125	1.134
$H_2 =$	1.047	1.058	1.118	1.118
$H_3 =$	1.037	1.087	1.098	1.112
Average height (in) $H =$	1.045	1.063	1.114	1.121
Total weight (g) $W =$	58.420	58.400	62.350	60.210
Bulk Unit Weight (pcf) $\gamma =$	142.66	130.64	136.17	130.23
Dry Unit Weight (pcf) $\gamma_d =$	128.09	109.95	114.66	109.98

Prepared by: M. de la Cruz Date: 11/28/11  
 Checked by: [Signature] Date: 11/28/11

# DENSITY-UNIT WEIGHT DETERMINATION



Client: Patrick Engineering, Inc.  
 Project: Washington Street  
 WEI Job No: 190-27-12

Analyst name: C. Iordache  
 Test date: 11/18/2011

	B-28 (11.0-12.5 ft)	B-28 (8.5-10.0 ft)		
<b>Water content determination</b>				
Mass of tare and wet soil (g) $W_w =$	77.40	66.02		
Mass of tare and dry soil (g) $W_d =$	66.48	47.04		
Mass of tare (g) $W_t =$	13.80	11.29		
Water content $w =$	21%	53%		

<b>Density-Unit Weight</b>				
Diameter measurements (in) $D_1 =$	1.401	1.457		
$D_2 =$	1.446	1.448		
$D_3 =$	1.442	1.402		
Average diameter (in) $D =$	1.430	1.436		
Height measurements (in) $H_1 =$	1.187	1.284		
$H_2 =$	1.189	1.221		
$H_3 =$	1.193	1.209		
Average height (in) $H =$	1.190	1.238		
Total weight (g) $W =$	63.800	54.730		
Bulk Unit Weight (pcf) $\gamma =$	127.29	104.05		
Dry Unit Weight (pcf) $\gamma_d =$	105.50	67.97		

Prepared by: M de los Rios Date: 11/28/11  
 Checked by: A.S. Date: 11/28/11



**Organic Content - Loss On Ignition**  
**ASTM D 2974, Method C**

Client: *Patrick Engineering*

Project: *Washington Street*

WEI Job: *190-27-12*

Sample ID/Location: *B-26-11 (8.5-10.0 ft)*

Type/Condition: *Bulk*

Testing Furnace Temp °C.: *440*

Analyst: *C. Iordache*

Date Sampled: *11/14/2011*

Date Tested: *11/22/2011*

Description: *Brown Clay*

	Wet soil + Tare (g)	Dry Soil + Tare (g)	Tare Mass (g)	Moisture Content (%)
oven-dry method	40.7	32.0	11.6	42.9

	Dry Soil + Tare (g)	Ash + Tare (g)	Tare Mass (g)	Ash Content (%)
Loss On Ignition	32.0	30.8	11.6	94.0

Organic Content (%)= 6.0

Notes:

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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Prepared by: *M. de los Angeles* Date: *11/28/11*

Checked by: *CS* Date: *11/28/11*



**Organic Content - Loss On Ignition  
ASTM D 2974, Method C**

Client: *Patrick Engineering*  
 Project: *Washington Street*  
 WEI Job: *190-27-12*  
 Sample ID/Location: *B-27-11 (6.0-7.5 ft)*  
 Type/Condition: *Bulk*  
 Testing Furnace Temp °C.: *440*

Analyst: *C. Iordache*  
 Date Sampled: *11/14/2011*  
 Date Tested: *11/22/2011*  
 Description: *Brown Clay*

	Wet soil + Tare (g)	Dry Soil + Tare (g)	Tare Mass (g)	Moisture Content (%)
oven-dry method	58.8	50.9	36.9	56.5

	Dry Soil + Tare (g)	Ash + Tare (g)	Tare Mass (g)	Ash Content (%)
Loss On Ignition	50.9	49.5	36.9	89.7

Organic Content (%)= 10.3

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Prepared by: *M. delos Reyes* Date: *11/28/11*  
 Checked by: *E.L.* Date: *11/20/11*



## Isotropically Consolidated-Undrained Triaxial Compression Test (AASHTO T 297/ASTM D 4767)

<b>Project:</b> Patrick Engineering; Washington Street <b>Sample ID:</b> Boring B-19, 31' to 33' <b>Sample description:</b> Gray SI CLAY Triaxial Cell No.: 1 Initial sample height: 5.96 in Initial sample diameter: 2.88 in Initial sample mass: 1391.30 g Soil specific gravity: 2.76 (estimated) Dry sample mass: 1190.23 g Final sample mass: 1389.63 g Initial water content: 16.89% (specimen) Initial unit weight: 136.77 pcf Initial dry unit weight: 117.00 pcf Initial void ratio: 0.472 Initial saturation: 98.8% Final water content: 16.75% (specimen) Liquid Limit, %: N/A Plastic Limit, %: N/A % Sand: N/A % Silt: N/A % Clay: N/A	<b>Tested by:</b> M. Snider <b>Prepared by:</b> M. Snider <b>Test date:</b> November 22, 2011 <b>WEI Job No.:</b> 190-27-12 Tare mass: 13.77 g Measured sample mass w/out Tare: 1391.30 g Tare and final sample mass: 1403.40 g Tare and dry sample mass: 1204.00 g Saturation (B) coefficient: 99% Rate of loading: 0.025 %/min Volume change during consolidation: 0.97 in <sup>3</sup> Void ratio after consolidation: 0.435 Dry unit weight after consolidation: 120.02 pcf Height after consolidation: 5.91 in Volume after consolidation: 37.78 in <sup>3</sup> Area after consolidation: 6.39 in <sup>2</sup> Time at 50% Consolidation: 72.63 min Effective consolidation stress: 25.0 psi Shear modulus: 733.25 psi
---	--

Axial displacement (Δh)	Axial force (F)	Pore pressure (u)	Axial strain (eps)	Deviator stress	Total vertical stress	Effective vertical stress	Effective horizontal stress	Shear stress, q=q'	Effective spherical stress, p'	Total spherical stress, p	Effective Principal Stress Ratio
in	pound	psi	%	psi	psi	psi	psi	psi	psi	psi	psi
0.00	0.000	0.0	0.00	0.0	25.0	25.0	25.00	0.00	25.00	25.00	1.00
0.01	33.198	2.0	0.10	5.2	30.2	28.1	22.95	2.60	25.55	27.60	1.23
0.01	56.313	4.3	0.20	8.8	33.8	29.5	20.70	4.40	25.10	29.40	1.42
0.02	68.614	5.7	0.30	10.7	35.7	30.0	19.31	5.35	24.66	30.35	1.55
0.02	77.463	6.2	0.40	12.1	37.1	30.8	18.77	6.04	24.81	31.04	1.64
0.03	84.795	7.0	0.50	13.2	38.2	31.2	17.98	6.60	24.58	31.60	1.73
0.04	90.804	7.7	0.60	14.1	39.1	31.4	17.29	7.06	24.35	32.06	1.82
0.04	96.317	8.3	0.70	15.0	40.0	31.6	16.67	7.48	24.16	32.48	1.90
0.05	101.344	8.8	0.80	15.7	40.7	31.9	16.18	7.87	24.05	32.87	1.97
0.05	106.210	9.3	0.90	16.5	41.5	32.2	15.73	8.24	23.97	33.24	2.05
0.06	110.637	9.6	1.00	17.1	42.1	32.5	15.40	8.57	23.97	33.57	2.11
0.09	130.821	10.6	1.50	20.2	45.2	34.6	14.39	10.08	24.47	35.08	2.40
0.12	149.198	10.9	2.00	22.9	47.9	36.9	14.06	11.44	25.50	36.44	2.63
0.15	166.928	11.0	2.50	25.5	50.5	39.5	14.03	12.74	26.77	37.74	2.81
0.18	184.732	10.6	3.00	28.0	53.0	42.5	14.42	14.02	28.44	39.02	2.94
0.21	200.743	10.0	3.50	30.3	55.3	45.3	14.98	15.16	30.14	40.16	3.02
0.24	215.133	9.3	4.00	32.3	57.3	48.0	15.66	16.16	31.82	41.16	3.06
0.27	227.401	8.6	4.50	34.0	59.0	50.4	16.40	16.99	33.40	41.99	3.07
0.30	237.654	7.9	5.00	35.3	60.3	52.5	17.12	17.67	34.79	42.67	3.06
0.33	246.304	7.1	5.50	36.4	61.4	54.3	17.86	18.21	36.07	43.21	3.04
0.36	253.780	6.4	6.00	37.3	62.3	55.9	18.58	18.67	37.25	43.67	3.01
0.39	261.777	5.7	6.50	38.3	63.3	57.6	19.30	19.15	38.45	44.15	2.98
0.42	271.415	5.0	7.00	39.5	64.5	59.5	19.97	19.75	39.72	44.75	2.98
0.45	277.607	4.4	7.50	40.2	65.2	60.8	20.58	20.09	40.67	45.09	2.95
0.48	283.864	3.8	8.00	40.9	65.9	62.0	21.16	20.44	41.60	45.44	2.93
0.51	289.183	3.3	8.50	41.4	66.4	63.1	21.72	20.71	42.43	45.71	2.91
0.54	292.840	2.8	9.00	41.7	66.7	63.9	22.16	20.85	43.01	45.85	2.88
0.57	297.296	2.4	9.50	42.1	67.1	64.8	22.65	21.05	43.70	46.05	2.86
0.60	302.999	1.9	10.00	42.7	67.7	65.8	23.11	21.34	44.45	46.34	2.85
0.66	310.544	1.2	11.00	43.3	68.3	67.1	23.84	21.63	45.46	46.63	2.81
0.72	315.268	0.7	12.00	43.4	68.4	67.8	24.34	21.71	46.05	46.71	2.78
0.78	318.704	0.0	13.00	43.4	68.4	68.4	24.97	21.70	46.66	46.70	2.74
0.81	321.597	-0.2	13.50	43.5	68.5	68.8	25.24	21.77	47.01	46.77	2.72
0.81	322.377	-0.3	13.65	43.6	68.6	68.9	25.33	21.78	47.11	46.78	2.72

Notes:

$p = \sigma_1 + \sigma_3 / 2$      $q = \sigma_1 - \sigma_3 / 2$

$p' = \sigma_1' + \sigma_3' / 2$      $q' = \sigma_1' - \sigma_3' / 2$

Wet Method Saturation

Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_

539





## Isotropically Consolidated-Undrained Triaxial Compression Test (AASHTO T 297/ASTM D 4767)

<b>Project:</b> Patrick Engineering; Washington Street <b>Sample ID:</b> Boring B-19, 31' to 33' <b>Sample description:</b> Gray SI CLAY <b>Triaxial Cell No.:</b> 2 Initial sample height: 6.00 in Initial sample diameter: 2.85 in Initial sample mass: 1394.10 g Soil specific gravity: 2.76 (estimated) Dry sample mass: 1192.40 g Final sample mass: 1389.70 g Initial water content: 16.92% (specimen) Initial unit weight: 138.49 pcf Initial dry unit weight: 118.46 pcf Initial void ratio: 0.454 Initial saturation: 100.0% Final water content: 16.55% (specimen) Liquid Limit, %: N/A Plastic Limit, %: N/A % Sand: N/A % Silt: N/A % Clay: N/A	<b>Tested by:</b> M. Snider <b>Prepared by:</b> M. Snider <b>Test date:</b> November 22, 2011 <b>WEI Job No.:</b> 190-27-12 Tare mass: 13.10 g Measured sample mass w/out Tare: 1394.10 g Tare and final sample mass: 1402.80 g Tare and dry sample mass: 1205.50 g Saturation (B) coefficient: 99% Rate of loading: 0.025 %/min Volume change during consolidation: 0.99 in <sup>3</sup> Void ratio after consolidation: 0.416 Dry unit weight after consolidation: 121.61 pcf Height after consolidation: 5.94 in Volume after consolidation: 37.35 in <sup>3</sup> Area after consolidation: 6.28 in <sup>2</sup> Time at 50% Consolidation: 106.68 min Effective consolidation stress: 40.0 psi Shear modulus: 1308.94 psi
---	--

Axial displacement (Δh)	Axial force (F)	Pore pressure (u)	Axial strain (εps)	Deviator stress	Total vertical stress	Effective vertical stress	Effective horizontal stress	Shear stress, q=q'	Effective spherical stress, p'	Total spherical stress, p	Effective Principal Stress Ratio
in	pound	psi	%	psi	psi	psi	psi	psi	psi	psi	psi
0.00	0.000	0.0	0.00	0.0	40.0	40.0	40.00	0.00	40.00	40.00	1.00
0.01	68.891	4.2	0.10	11.0	51.0	46.7	35.77	5.48	41.25	45.48	1.31
0.01	99.370	7.4	0.20	15.8	55.8	48.4	32.60	7.89	40.49	47.89	1.48
0.02	119.353	9.6	0.30	18.9	58.9	49.3	30.40	9.47	39.87	49.47	1.62
0.02	134.767	11.1	0.40	21.4	61.4	50.2	28.87	10.68	39.55	50.68	1.74
0.03	147.889	12.3	0.50	23.4	63.4	51.1	27.73	11.71	39.44	51.71	1.84
0.04	158.762	13.1	0.60	25.1	65.1	52.0	26.86	12.56	39.41	52.56	1.94
0.04	169.258	13.9	0.70	26.7	66.7	52.9	26.13	13.37	39.50	53.37	2.02
0.05	178.563	14.4	0.80	28.2	68.2	53.8	25.58	14.10	39.67	54.10	2.10
0.05	187.233	14.9	0.90	29.5	69.5	54.7	25.13	14.76	39.89	54.76	2.18
0.06	194.658	15.2	1.00	30.7	70.7	55.4	24.77	15.33	40.10	55.33	2.24
0.09	218.871	16.0	1.50	34.3	74.3	58.3	24.01	17.16	41.16	57.16	2.43
0.12	234.259	16.1	2.00	36.5	76.5	60.5	23.92	18.27	42.19	58.27	2.53
0.15	247.315	15.8	2.50	38.4	78.4	62.6	24.21	19.19	43.40	59.19	2.58
0.18	253.722	15.4	3.00	39.2	79.2	63.8	24.59	19.58	44.17	59.58	2.59
0.21	259.593	15.1	3.50	39.9	79.9	64.7	24.86	19.93	44.79	59.93	2.60
0.24	267.156	14.6	4.00	40.8	80.8	66.2	25.36	20.41	45.77	60.41	2.61
0.27	275.616	14.1	4.50	41.9	81.9	67.8	25.88	20.94	46.82	60.94	2.62
0.30	281.081	13.6	5.00	42.5	82.5	68.9	26.40	21.25	47.65	61.25	2.61
0.33	288.161	13.1	5.50	43.3	83.3	70.2	26.87	21.67	48.54	61.67	2.61
0.36	293.037	12.7	6.00	43.8	83.8	71.1	27.30	21.92	49.22	61.92	2.61
0.39	294.403	12.4	6.50	43.8	83.8	71.4	27.63	21.90	49.54	61.90	2.59
0.42	298.824	12.0	7.00	44.2	84.2	72.2	27.97	22.11	50.08	62.11	2.58
0.45	307.853	11.7	7.50	45.3	85.3	73.6	28.31	22.66	50.97	62.66	2.60
0.48	312.617	11.4	8.00	45.8	85.8	74.4	28.64	22.89	51.53	62.89	2.60
0.51	314.618	11.0	8.50	45.8	85.8	74.8	28.97	22.91	51.88	62.91	2.58
0.54	318.947	10.7	9.00	46.2	86.2	75.5	29.28	23.10	52.37	63.10	2.58
0.57	318.393	10.5	9.50	45.9	85.9	75.4	29.53	22.93	52.46	62.93	2.55
0.60	317.230	10.2	10.00	45.4	85.4	75.2	29.78	22.72	52.50	62.72	2.53
0.66	322.411	9.9	11.00	45.7	85.7	75.7	30.06	22.83	52.89	62.83	2.52
0.72	325.342	9.7	12.00	45.6	85.6	75.9	30.34	22.78	53.12	62.78	2.50
0.78	323.506	9.5	13.00	44.8	84.8	75.3	30.49	22.40	52.89	62.40	2.47
0.84	321.417	9.4	14.00	44.0	84.0	74.6	30.61	22.00	52.60	62.00	2.44
0.90	327.953	9.3	15.00	44.4	84.4	75.1	30.70	22.18	52.88	62.18	2.45

Notes:

$p = \sigma_1 + \sigma_3 / 2$      $q = \sigma_1 - \sigma_3 / 2$

$p' = \sigma_1' + \sigma_3' / 2$      $q' = \sigma_1' - \sigma_3' / 2$

Wet Method Saturation

Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_



## Isotropically Consolidated-Undrained Triaxial Compression Test (AASHTO T 297/ASTM D 4767)

<b>Project:</b> Patrick Engineering; Washington Street <b>Sample ID:</b> Boring B-19, 31' to 33' <b>Sample description:</b> Gray SI CLAY <b>Triaxial Cell No.:</b> 3 Initial sample height: 5.93 in Initial sample diameter: 2.86 in Initial sample mass: 1373.40 g Soil specific gravity: 2.76 (estimated) Dry sample mass: 1173.10 g Final sample mass: 1362.30 g Initial water content: 17.07% (specimen) Initial unit weight: 136.98 pcf Initial dry unit weight: 117.01 pcf Initial void ratio: 0.472 Initial saturation: 99.9% Final water content: 16.13% (specimen) Liquid Limit, %: N/A Plastic Limit, %: N/A % Sand: N/A % Silt: N/A % Clay: N/A	<b>Tested by:</b> M. Snider <b>Prepared by:</b> M. Snider <b>Test date:</b> November 22, 2011 <b>WEI Job No.:</b> 190-27-12 Tare mass: 14.40 g Measured sample mass w/out Tare: 1373.40 g Tare and final sample mass: 1376.70 g Tare and dry sample mass: 1187.50 g Saturation (B) coefficient: 99% Rate of loading: 0.025 %/min Volume change during consolidation: 1.28 in <sup>3</sup> Void ratio after consolidation: 0.423 Dry unit weight after consolidation: 121.06 pcf Height after consolidation: 5.86 in Volume after consolidation: 36.92 in <sup>3</sup> Area after consolidation: 6.30 in <sup>2</sup> Time at 50% Consolidation: 130.82 min Effective consolidation stress: 55.0 psi Shear modulus: 1584.47 psi
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Axial displacement (Δh)	Axial force (F)	Pore pressure (u)	Axial strain (εps)	Deviator stress	Total vertical stress	Effective vertical stress	Effective horizontal stress	Shear stress, q=q'	Effective spherical stress, p'	Total spherical stress, p	Effective Principal Stress Ratio
in	pound	psi	%	psi	psi	psi	psi	psi	psi	psi	psi
0.00	0.000	0.0	0.00	0.0	55.0	55.0	55.00	0.00	55.00	55.00	1.00
0.01	72.992	3.7	0.10	11.6	66.6	62.9	51.29	5.79	57.08	60.79	1.23
0.01	119.509	8.2	0.20	18.9	73.9	65.8	46.81	9.47	56.29	64.47	1.40
0.02	149.687	11.7	0.30	23.7	78.7	67.0	43.29	11.85	55.14	66.85	1.55
0.02	172.487	14.3	0.40	27.3	82.3	68.0	40.68	13.64	54.33	68.64	1.67
0.03	190.611	16.6	0.50	30.1	85.1	68.5	38.39	15.06	53.45	70.06	1.78
0.04	206.360	18.3	0.60	32.6	87.6	69.3	36.68	16.29	52.97	71.29	1.89
0.04	219.712	19.8	0.70	34.6	89.6	69.8	35.17	17.32	52.49	72.32	1.99
0.05	231.387	21.0	0.80	36.5	91.5	70.5	34.04	18.23	52.26	73.23	2.07
0.05	241.078	22.0	0.90	37.9	92.9	70.9	32.99	18.97	51.96	73.97	2.15
0.06	248.979	22.8	1.00	39.1	94.1	71.3	32.17	19.57	51.74	74.57	2.22
0.09	277.841	25.3	1.50	43.5	98.5	73.1	29.66	21.73	51.39	76.73	2.47
0.12	301.762	26.6	2.00	47.0	102.0	75.4	28.44	23.48	51.92	78.48	2.65
0.15	316.622	27.1	2.50	49.0	104.0	76.9	27.89	24.51	52.40	79.51	2.76
0.18	326.180	27.2	3.00	50.2	105.2	78.0	27.77	25.12	52.89	80.12	2.81
0.21	336.528	27.1	3.50	51.6	106.6	79.4	27.86	25.79	53.65	80.79	2.85
0.24	351.006	26.9	4.00	53.5	108.5	81.6	28.10	26.76	54.86	81.76	2.90
0.27	363.125	26.5	4.50	55.1	110.1	83.5	28.47	27.54	56.00	82.54	2.93
0.30	369.732	26.1	5.00	55.8	110.8	84.7	28.89	27.89	56.78	82.89	2.93
0.33	379.770	25.7	5.50	57.0	112.0	86.3	29.34	28.50	57.84	83.50	2.94
0.36	384.015	25.3	6.00	57.3	112.3	87.0	29.71	28.66	58.38	83.66	2.93
0.39	387.586	24.9	6.50	57.6	112.6	87.7	30.13	28.78	58.91	83.78	2.91
0.42	394.108	24.4	7.00	58.2	113.2	88.8	30.58	29.10	59.68	84.10	2.90
0.44	404.159	23.9	7.50	59.4	114.4	90.4	31.06	29.69	60.74	84.69	2.91
0.47	410.302	23.4	8.00	59.9	114.9	91.5	31.60	29.97	61.57	84.97	2.90
0.50	415.345	23.2	8.50	60.4	115.4	92.1	31.77	30.18	61.94	85.18	2.90
0.53	419.939	22.8	9.00	60.7	115.7	92.9	32.17	30.34	62.52	85.34	2.89
0.56	421.856	22.4	9.50	60.6	115.6	93.3	32.63	30.31	62.94	85.31	2.86
0.59	424.154	22.0	10.00	60.6	115.6	93.7	33.03	30.31	63.34	85.31	2.84
0.65	438.588	21.4	11.00	62.0	117.0	95.6	33.59	30.99	64.58	85.99	2.85
0.71	445.059	21.0	12.00	62.2	117.2	96.2	34.05	31.10	65.14	86.10	2.83
0.77	445.243	20.6	13.00	61.5	116.5	95.9	34.43	30.76	65.19	85.76	2.79
0.83	452.293	20.0	14.00	61.8	116.8	96.8	35.01	30.89	65.89	85.89	2.76
0.87	459.262	19.9	14.60	62.3	117.3	97.4	35.13	31.14	66.27	86.14	2.77

Notes:

$p = \sigma_1 + \sigma_3 / 2$      $q = \sigma_1 - \sigma_3 / 2$

$p' = \sigma_1' + \sigma_3' / 2$      $q' = \sigma_1' - \sigma_3' / 2$

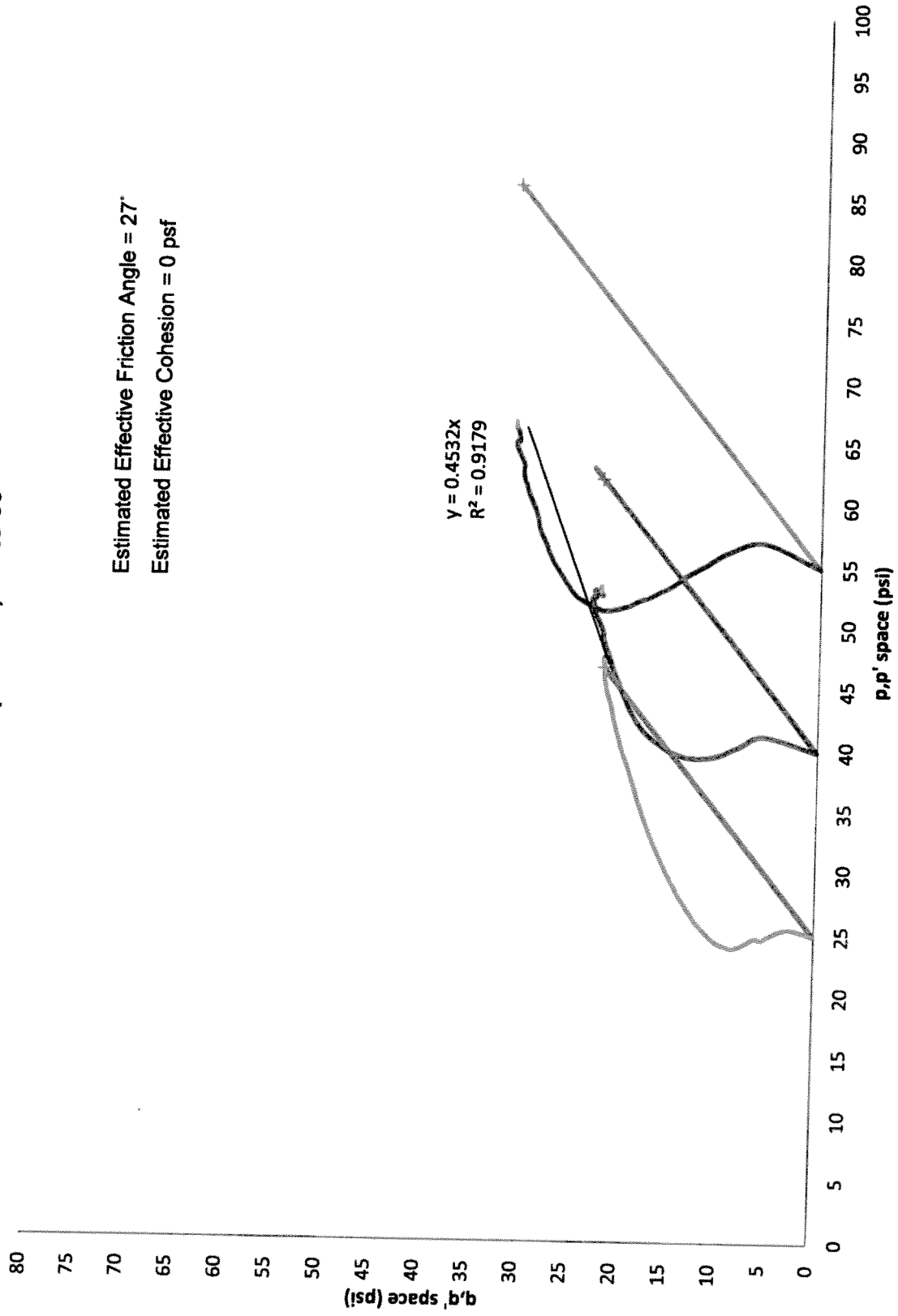
Wet Method Saturation

Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_

**Triaxial Compression Total and Effective Stress Paths at Failure (p-q Space)  
15% Strain, Sample B-19, 31' to 33'**

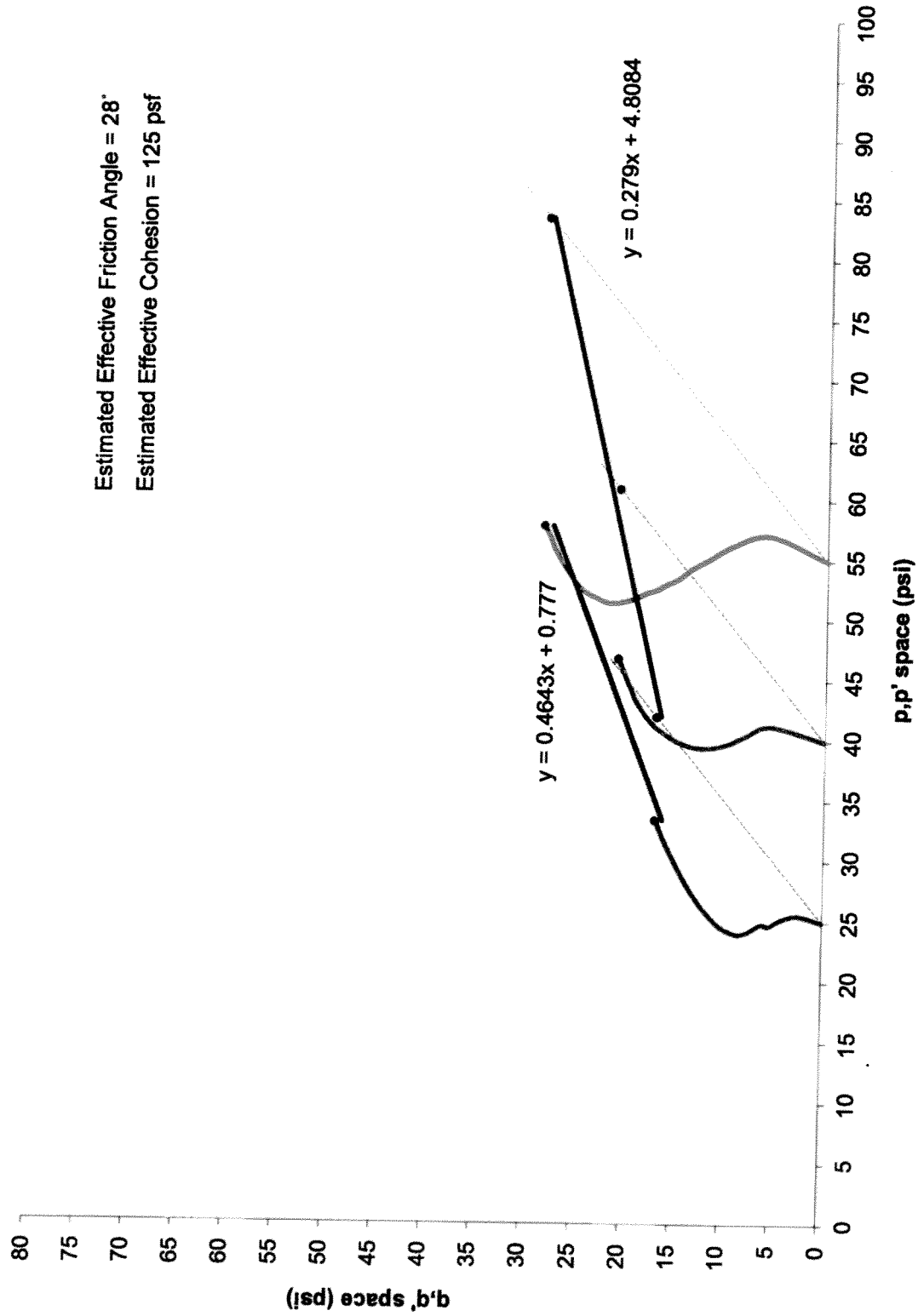
Estimated Effective Friction Angle = 27°  
Estimated Effective Cohesion = 0 psf



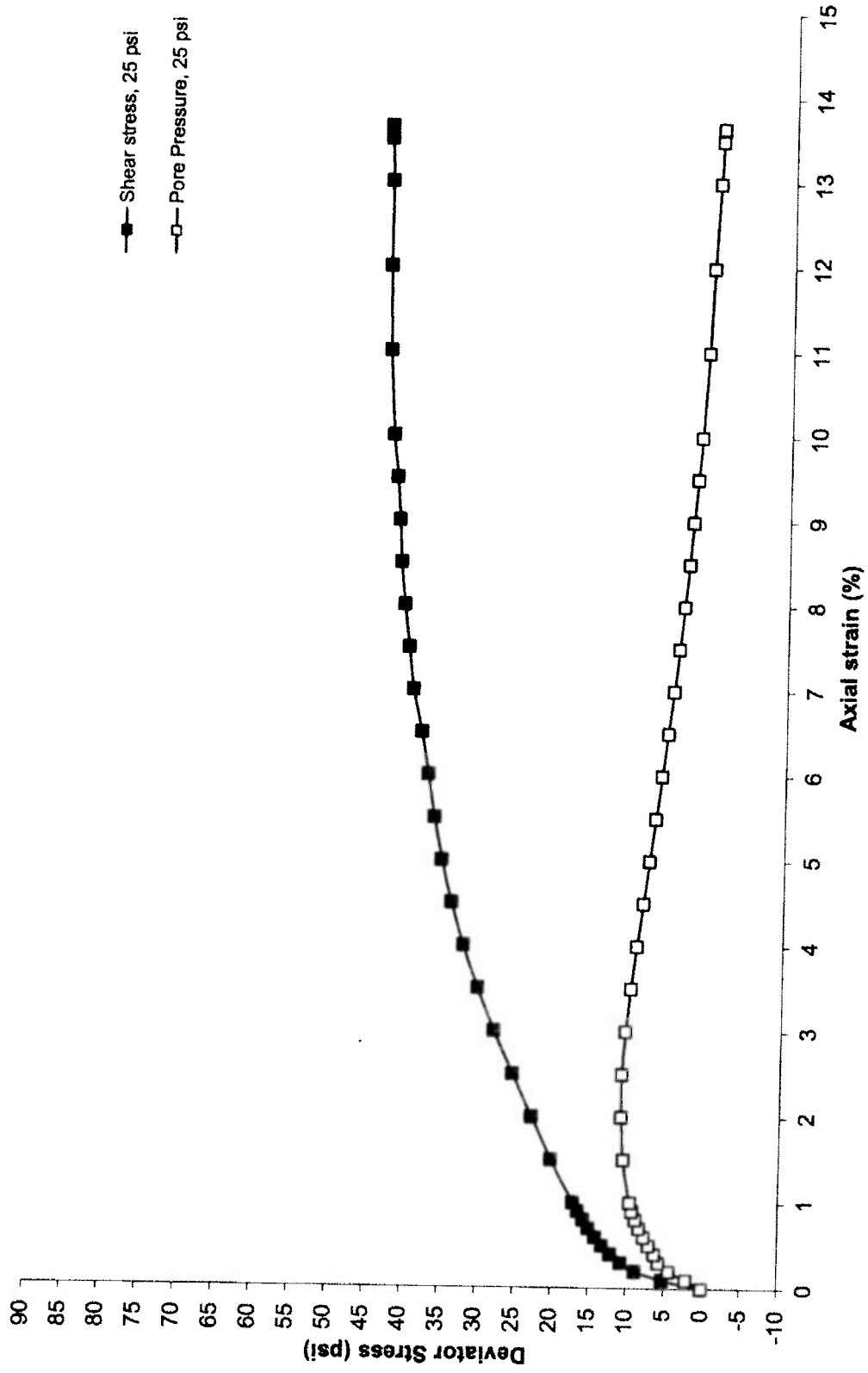
**Triaxial Compression Total and Effective Stress Paths at Failure (p-q Space)  
Maximum Shear Stress Ratio, Sample B-19, 31' to 33'**

Estimated Effective Friction Angle = 28°

Estimated Effective Cohesion = 125 psf

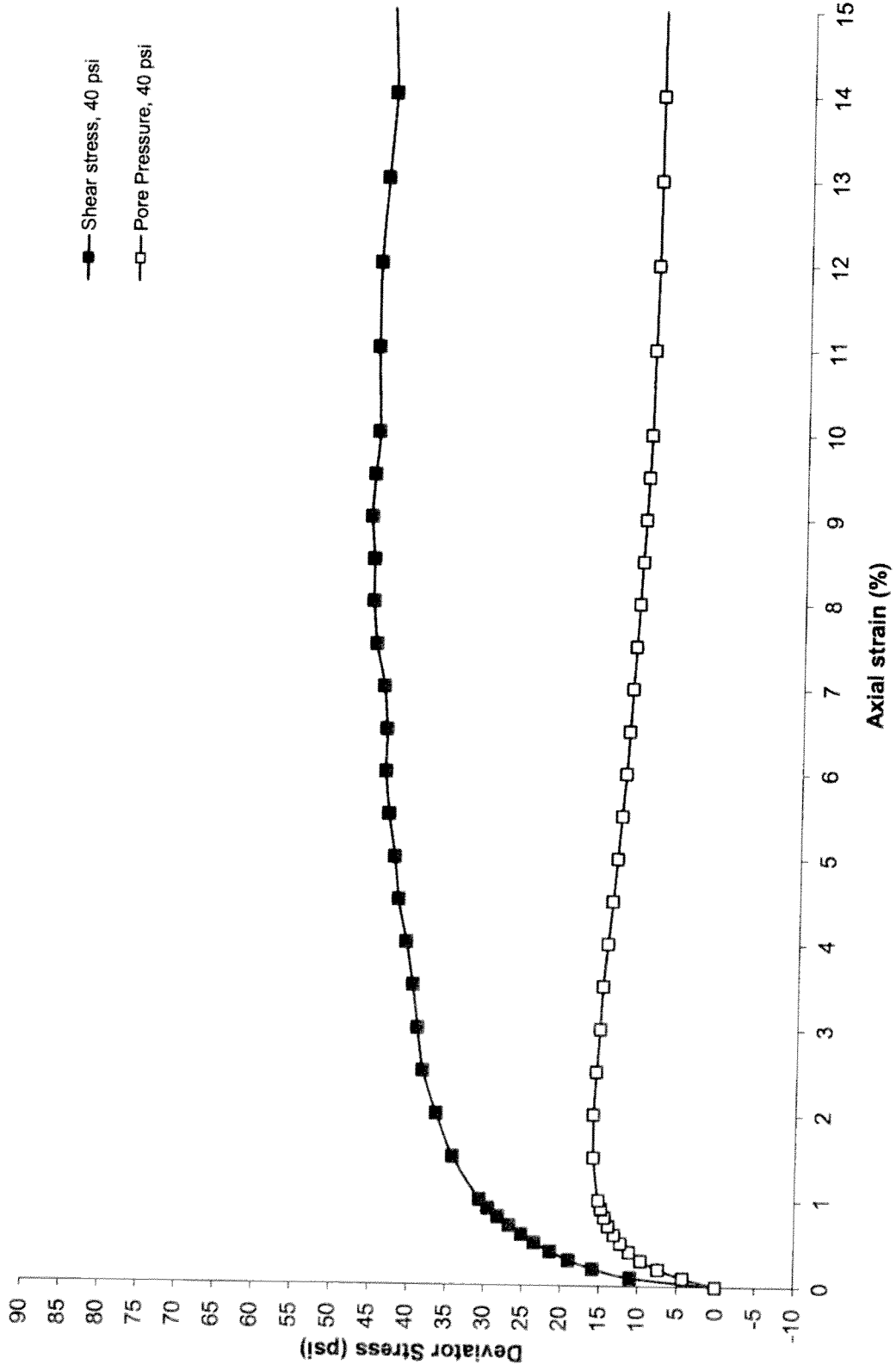


**Sample B-19, 31' to 33': Stress v. Strain and Pore Pressure v. Strain Curves  
25.0 psi Confining Pressure**

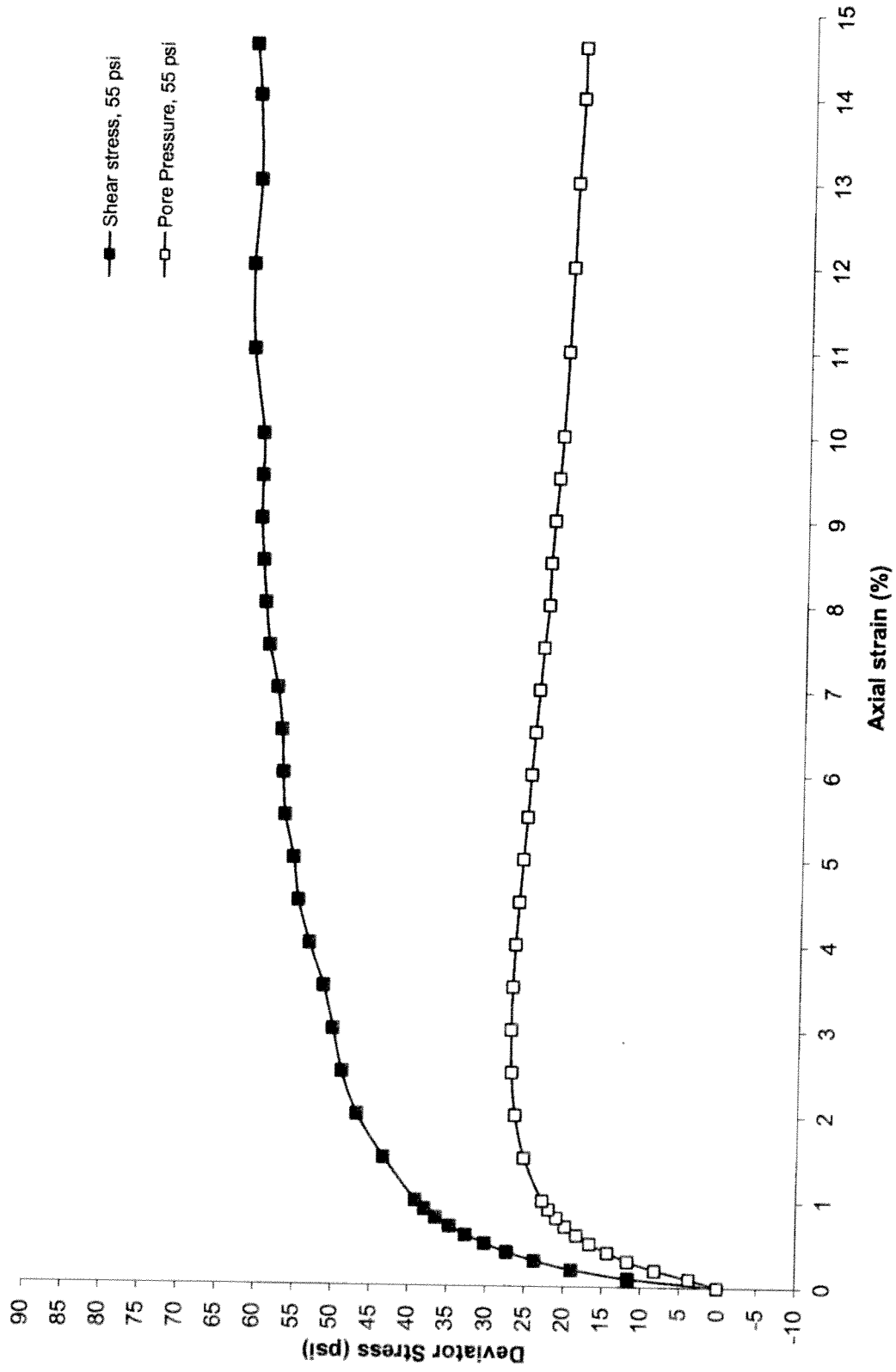


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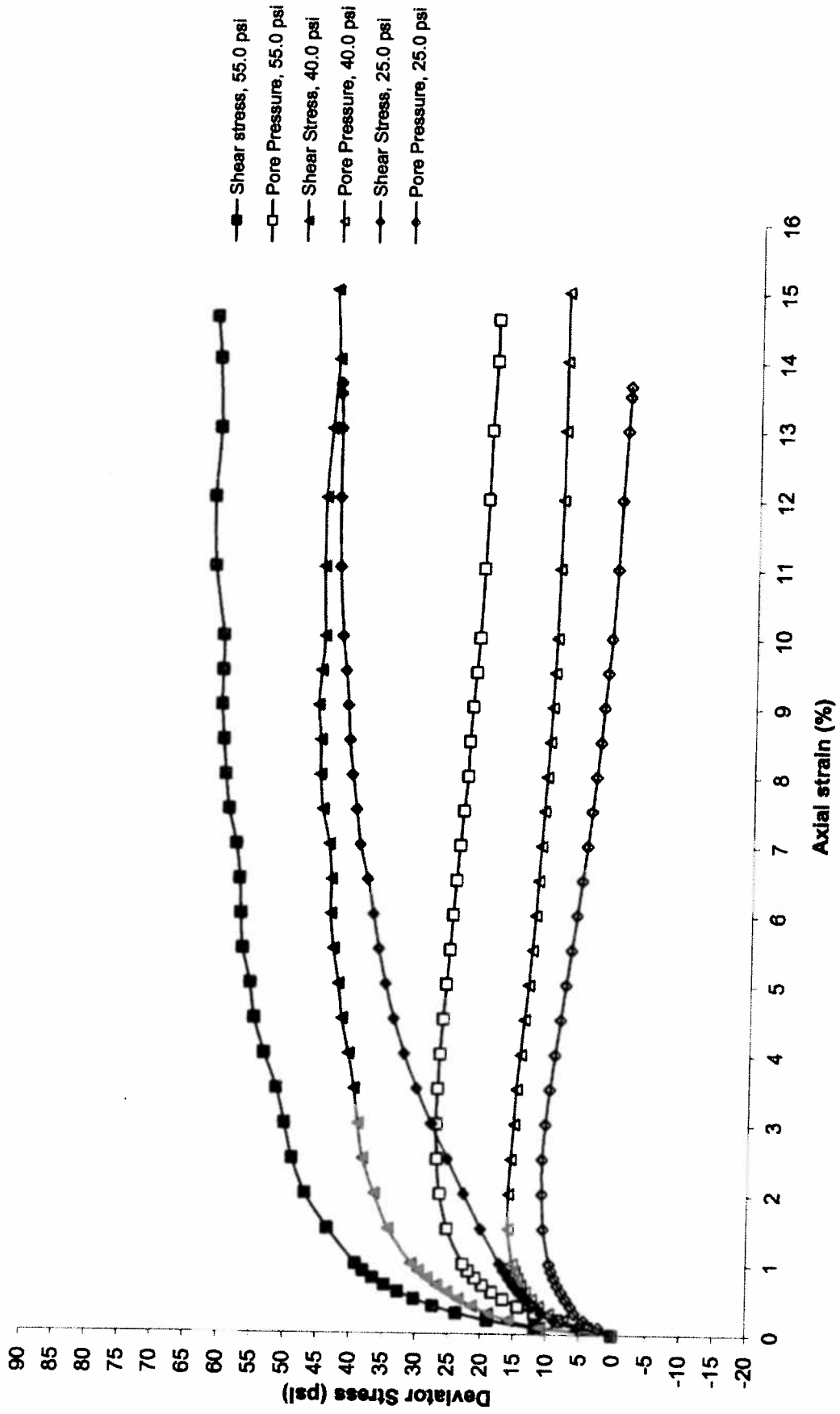
**Sample B-19, 31' to 33': Stress v. Strain and Pore Pressure v. Strain Curves  
40.0 psi Confining Pressure**



**Sample B-19, 31' to 33': Stress v. Strain and Pore Pressure v. Strain Curves  
55 psi Confining Pressure**

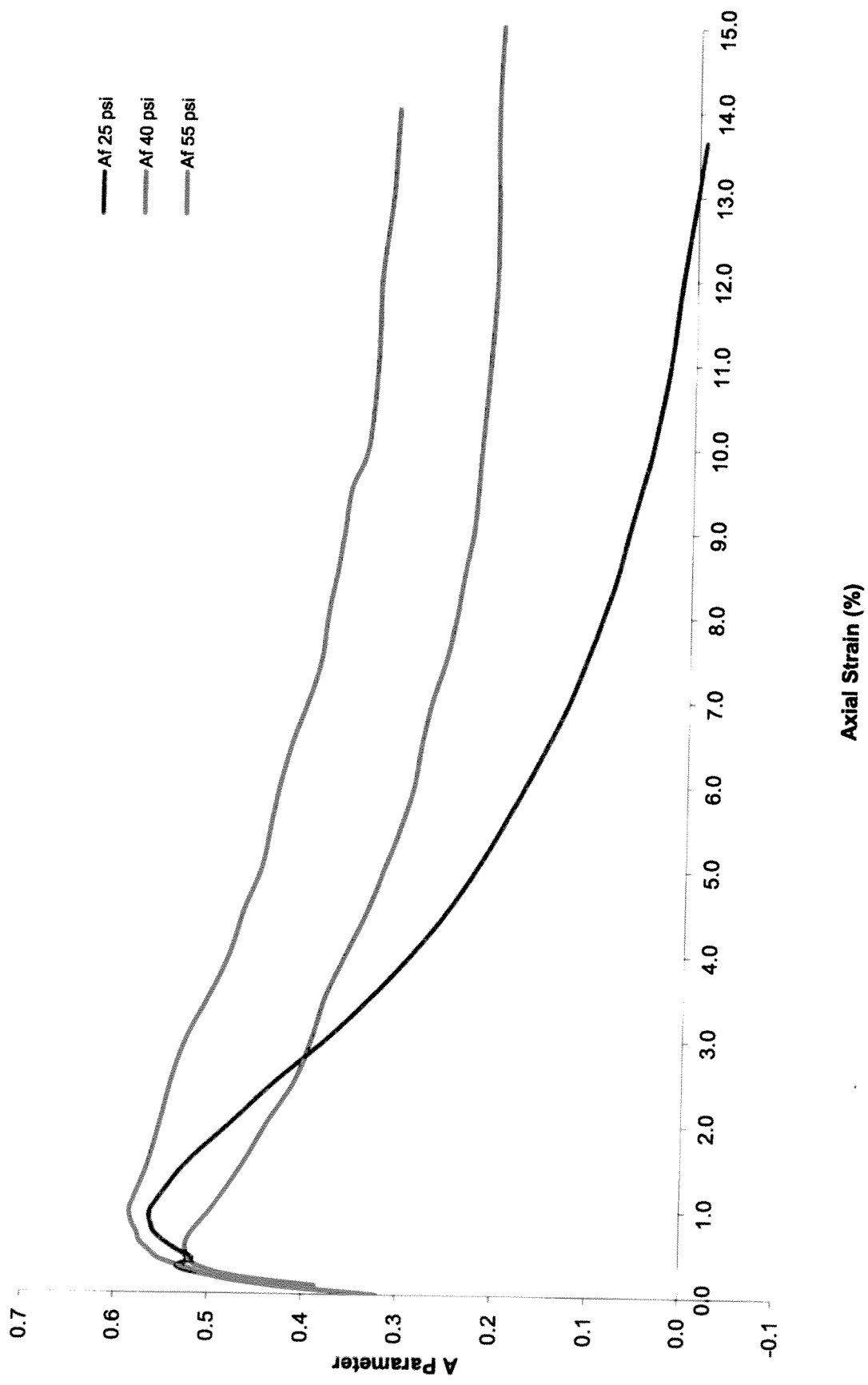


Sample B-19, 31' to 33': Stress v. Strain and Pore Pressure v. Strain Curves  
All Confining Pressures





**A-Parameter During Shearing  
Sample B-19, 31' to 33'**



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# CONSOLIDATION TEST

## (ASTM D 2435, AASHTO T 216)

**Project:** Patrick Engineering; Washington Street  
**Sample ID:** Boring B-19, 31' to 33'  
**Sample description:** *Brown and Gray SI CLAY*

Tested by: WEI Laboratory  
 Prepared by: M. Snider  
 Test date: Nov-11  
 WEI: 190-27-12  
 Ring diameter = 2.500 in  
 Ring mass = 109.53 g  
 Initial sample and ring mass = 274.06 g  
 Tare mass = 13.57 g  
 Final ring and sample mass = 272.73 g  
 Mass of wet sample and tare = 176.28 g  
 Mass of dry sample and tare = 153.00 g  
 Initial dial reading = 0.01000 in  
 Final dial reading = 0.10108 in  
 LL= NA  
 PL= NA  
 % Sand= NA  
 % Silt= NA  
 % Clay= NA

Initial sample height = 1.002 in  
 Initial sample mass = 164.53 g  
 Initial water content = 18.00%  
 Initial dry unit weight = 108.07 pcf  
 Initial void ratio = 0.594  
 Initial degree of saturation = 83.69%  
 Final sample mass = 162.71 g  
 Final dry sample mass = 139.43 g  
 Final water content = 16.70%  
 Final dry unit weight = 118.88 pcf  
 Final void ratio = 0.449  
 Final degree of saturation = 100.00%  
 Estimated specific gravity = 2.76

**In-Situ Vertical Effective Stress = 2500 psf**

### Compression and Swelling Indices

Compression index  $C_c = 0.145$   
 Field corrected  $C_c = 0.162$   
 Swelling index  $C_s = 0.035$

### Preconsolidation pressure, $\sigma_c$

Casagrande Method = 2552 psf

**Over-Consolidation Ratio (OCR) = 1.02**

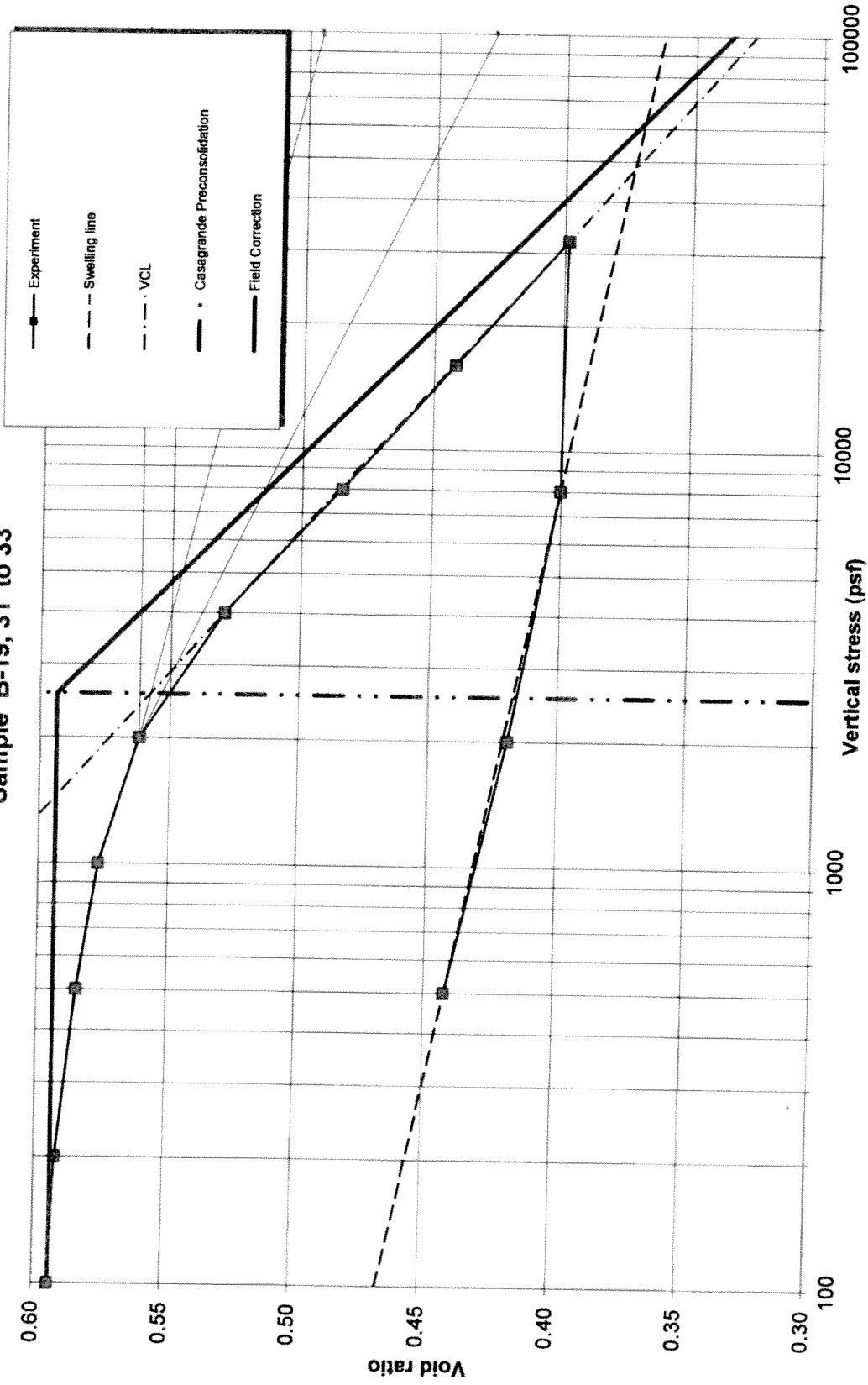
Load number	Vertical stress psf	Dial reading in	System deflection in	Vertical strain %	Void ratio	$C_v$ ft <sup>2</sup> /day	$C_{\alpha e}$ %	Elapsed time min
1	100.0	0.00977	0.00010	-0.01	0.594	N/A	N/A	1356
2	200.0	0.01084	0.00023	0.11	0.592	0.1781	0.02	1500
3	500.0	0.01498	0.00058	0.56	0.585	0.2354	0.03	1650
4	1000.0	0.01959	0.00090	1.05	0.577	0.2450	0.11	1476
5	2000.0	0.02864	0.00135	2.00	0.562	0.2614	0.12	1290
6	4000.0	0.04848	0.00193	4.03	0.529	0.0888	0.14	1380
7	8000.0	0.07601	0.00253	6.84	0.485	0.2023	0.24	1410
8	16000.0	0.10238	0.00324	9.55	0.442	0.1700	0.27	1416
9	32000.0	0.12857	0.00413	12.25	0.398	0.0302	0.34	1680
10	8000.0	0.12867	0.00295	12.14	0.400	N/A	N/A	2000
11	2000.0	0.11762	0.00198	10.94	0.419	N/A	N/A	1440
11	500.0	0.10408	0.00123	9.52	0.442	N/A	N/A	1356

Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_

# CONSOLIDATION CURVE

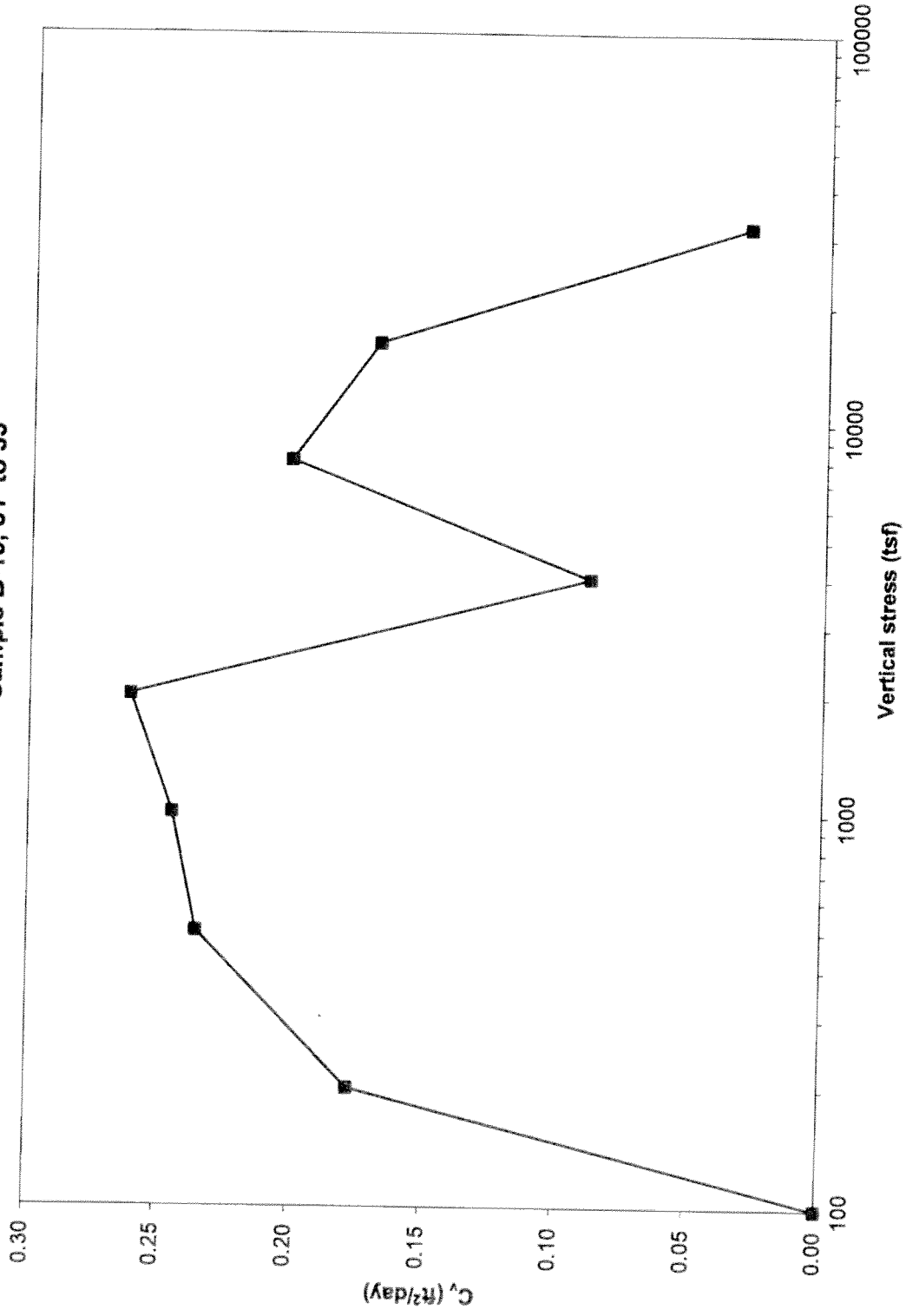
Sample B-19, 31' to 33'



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# CONSOLIDATION COEFFICIENT ( $C_v$ ) vs. VERTICAL STRESS

Sample B-19, 31' to 33'



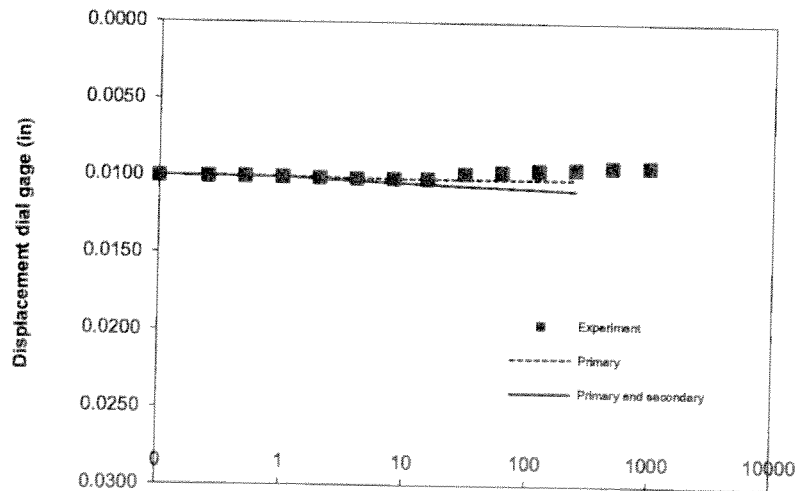
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Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
50.0	0.00	0.01000	0.01001	0.01001
	0.10	0.01005	0.01003	0.01003
	0.25	0.01005	0.01005	0.01005
	0.50	0.01005	0.01006	0.01006
	1.00	0.01008	0.01009	0.01009
	2.00	0.01013	0.01012	0.01020
	4.00	0.01016	0.01015	0.01032
	8.00	0.01018	0.01018	0.01044
	15.00	0.01018	0.01018	0.01053
	30.00	0.00982	0.01019	0.01062
	60.00	0.00969	0.01019	0.01071
	120.00	0.00958	0.01019	0.01080
	240.00	0.00950	0.01019	0.01089
	480.00	0.00934	0.01019	0.01098
	978.00	0.00932	0.01019	0.01107

$h_0 = 1.00150$  in  
 $U_s = 99\%$   
 $t_s = 12.01$  min  
 $d_s = 0.01018$  in  
 $d_0 = 0.01001$  in  
 $d_{100} = 0.01019$  in  
 $d = 0.50070$  in  
 $C_v = 0.0372$  in<sup>2</sup>/min  
 $r_i = -1.6\%$   
 $r_p = -25.6\%$   
 $r_s = 127.2\%$   
 Slope = -0.0003  
 Intercept = 0.0102  
 $h_c = 1.0013$  in  
 $t_c = 1.07$  min  
 $C_{ae} = 0.030\%$

Time-Deformation curve for 50 psf seating load  
Time (min)

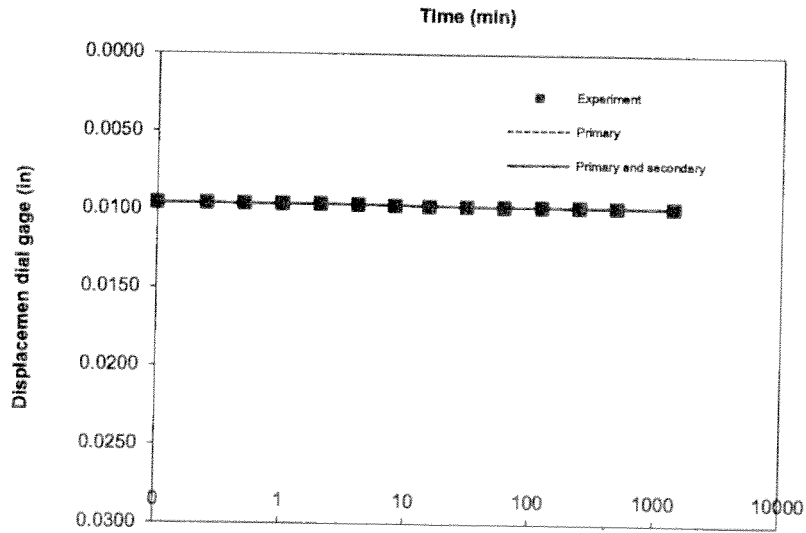




Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
100.0	0.00	0.00953	0.00960	0.00960
	0.10	0.00958	0.00961	0.00961
	0.25	0.00958	0.00962	0.00962
	0.50	0.00961	0.00962	0.00962
	1.00	0.00963	0.00963	0.00963
	2.00	0.00963	0.00964	0.00964
	4.00	0.00966	0.00966	0.00966
	8.00	0.00971	0.00968	0.00968
	15.00	0.00974	0.00971	0.00971
	30.00	0.00974	0.00974	0.00974
	60.00	0.00976	0.00976	0.00976
	120.00	0.00976	0.00977	0.00977
	240.00	0.00976	0.00977	0.00977
	480.00	0.00979	0.00977	0.00978
	1356.00	0.00979	0.00977	0.00979

$h_0 = 1.00197$  in  
 $U_s = 99\%$   
 $t_s = 79.65$  min  
 $d_s = 0.00976$  in  
 $d_0 = 0.00960$  in  
 $d_{100} = 0.00977$  in  
 $d = 0.50091$  in  
 $C_v = 0.0056$  in<sup>2</sup>/min  
 $r_i = 27.7\%$   
 $r_p = 63.1\%$   
 $r_s = 9.2\%$   
 Slope = 0.0000  
 Intercept = 0.0097  
 $h_c = 1.0017$  in  
 $t_c = 150.82$  min  
 $C_{ae} = 0.003\%$

Time-Deformation curve for 100 psf load

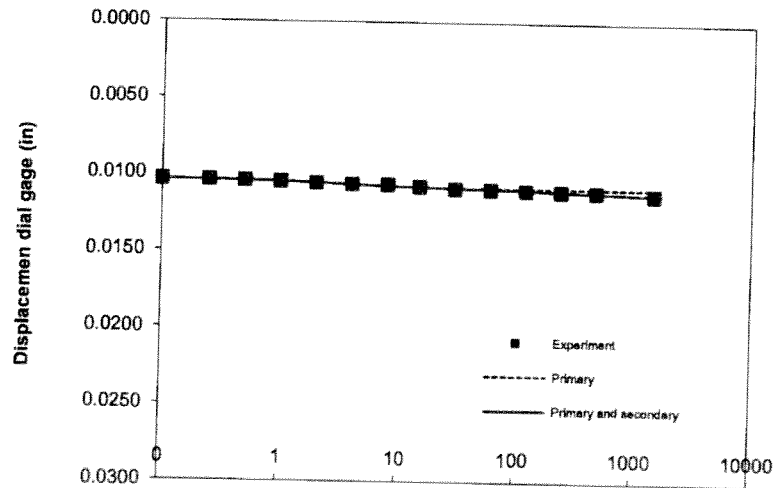




Applied stress psf	Elapsed time min	Dial in	Fitted Primary in	Fitted Primary and Secondary in
200.0	0.00	0.01018	0.01032	0.01032
	0.10	0.01037	0.01037	0.01037
	0.25	0.01039	0.01040	0.01040
	0.50	0.01042	0.01043	0.01043
	1.00	0.01047	0.01048	0.01048
	2.00	0.01055	0.01054	0.01054
	4.00	0.01063	0.01063	0.01063
	8.00	0.01066	0.01074	0.01074
	15.00	0.01076	0.01081	0.01081
	30.00	0.01086	0.01084	0.01084
	60.00	0.01092	0.01084	0.01088
	120.00	0.01097	0.01084	0.01095
	240.00	0.01102	0.01084	0.01102
	480.00	0.01108	0.01084	0.01109
	1500.00	0.01121	0.01084	0.01120

$h_0 = 1.00132$  in  
 $U_s = 99\%$   
 $t_s = 25.05$  min  
 $d_s = 0.01083$  in  
 $d_0 = 0.01032$  in  
 $d_{100} = 0.01084$  in  
 $d = 0.50046$  in  
 $C_v = 0.0178$  in<sup>2</sup>/min  
 $r_i = 13.5\%$   
 $r_p = 50.6\%$   
 $r_s = 35.9\%$   
 Slope = 0.0002  
 Intercept = 0.0105  
 $h_c = 1.0007$  in  
 $t_c = 41.87$  min  
 $C_{ae} = 0.023\%$

Time-Deformation curve for 200 psf load  
Time (min)

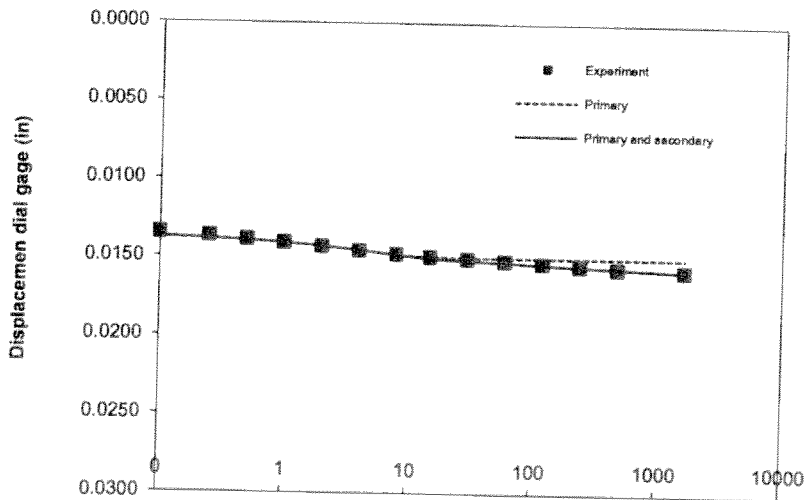




Applied stress psf	Elapsed time min	Dial in	Fitted Primary in	Fitted Primary and Secondary in
500.0	0.00	0.01239	0.01362	0.01362
	0.10	0.01346	0.01377	0.01377
	0.25	0.01367	0.01386	0.01386
	0.50	0.01388	0.01396	0.01396
	1.00	0.01409	0.01409	0.01409
	2.00	0.01430	0.01429	0.01429
	4.00	0.01456	0.01455	0.01455
	8.00	0.01477	0.01481	0.01481
	15.00	0.01493	0.01495	0.01504
	30.00	0.01506	0.01498	0.01517
	60.00	0.01519	0.01498	0.01527
	120.00	0.01529	0.01498	0.01537
	240.00	0.01545	0.01498	0.01547
	480.00	0.01561	0.01498	0.01557
	1650.00	0.01574	0.01498	0.01575

$h_0 = 0.99911$  in  
 $U_s = 99\%$   
 $t_s = 18.81$  min  
 $d_s = 0.01497$  in  
 $d_0 = 0.01362$  in  
 $d_{100} = 0.01498$  in  
 $d = 0.49860$  in  
 $C_v = 0.0235$  in<sup>2</sup>/min  
 $r_i = 36.9\%$   
 $r_p = 40.4\%$   
 $r_s = 22.7\%$   
 Slope = 0.0003  
 Intercept = 0.0147  
 $h_c = 0.9965$  in  
 $t_c = 7.84$  min  
 $C_{ae} = 0.033\%$

Time-Deformation curve for 500 psf load  
Time (min)



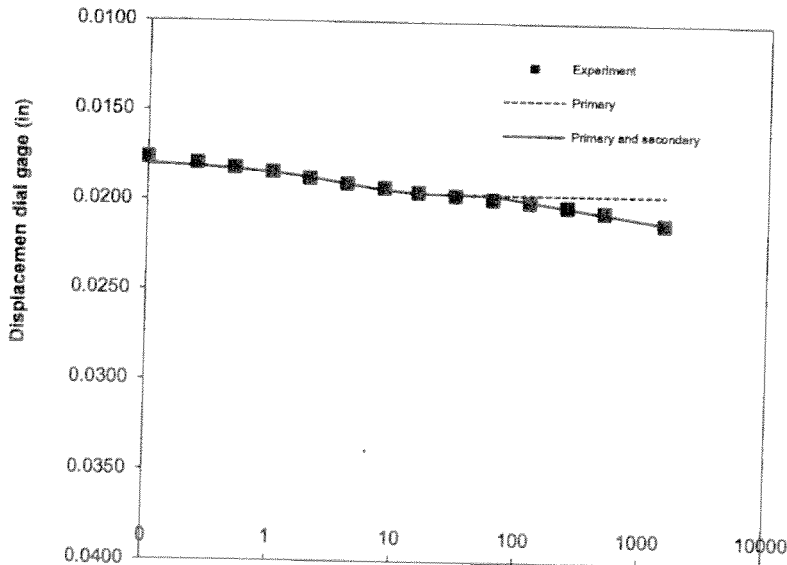




Applied stress psf	Elapsed time min	Dial in	Fitted Primary in	Fitted Primary and Secondary in
1000.0	0.00	0.01658	0.01785	0.01785
	0.10	0.01768	0.01805	0.01805
	0.25	0.01797	0.01816	0.01816
	0.50	0.01823	0.01829	0.01829
	1.00	0.01844	0.01847	0.01847
	2.00	0.01878	0.01873	0.01873
	4.00	0.01907	0.01906	0.01906
	8.00	0.01930	0.01939	0.01939
	15.00	0.01954	0.01956	0.01956
	30.00	0.01970	0.01959	0.01959
	60.00	0.01988	0.01959	0.01965
	120.00	0.02004	0.01959	0.01997
	240.00	0.02025	0.01959	0.02029
	480.00	0.02054	0.01959	0.02061
	1476.00	0.02119	0.01959	0.02114

$h_0 = 0.99492$  in  
 $U_s = 99\%$   
 $t_s = 17.91$  min  
 $d_s = 0.01958$  in  
 $d_0 = 0.01785$  in  
 $d_{100} = 0.01959$  in  
 $d = 0.49639$  in  
 $C_v = 0.0245$  in<sup>2</sup>/min  
 $r_i = 27.6\%$   
 $r_p = 37.8\%$   
 $r_s = 34.7\%$   
 Slope = 0.0011  
 Intercept = 0.0177  
 $h_c = 0.9919$  in  
 $t_c = 53.16$  min  
 $C_{ae} = 0.108\%$

Time-Deformation curve for 1000 psf load  
Time (min)

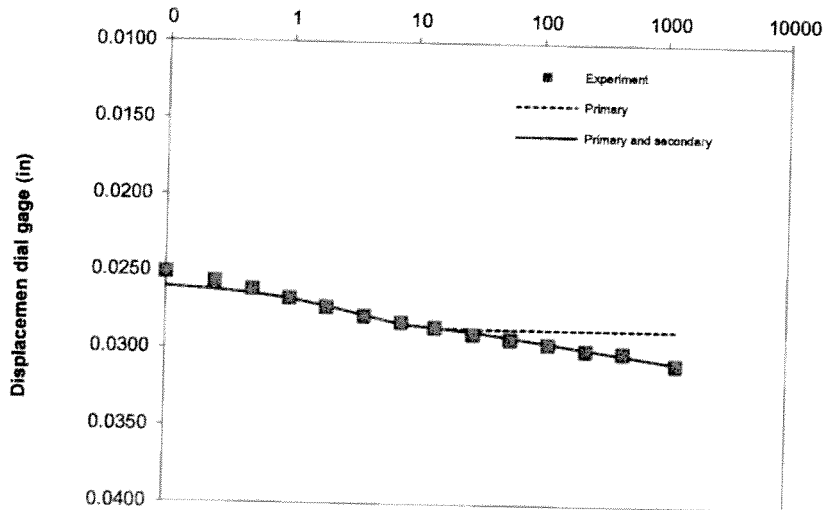




Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
2000.0	0.00	0.02300	0.02569	0.02569
	0.10	0.02510	0.02604	0.02604
	0.25	0.02567	0.02624	0.02624
	0.50	0.02617	0.02647	0.02647
	1.00	0.02675	0.02678	0.02678
	2.00	0.02730	0.02724	0.02724
	4.00	0.02785	0.02781	0.02781
	8.00	0.02824	0.02835	0.02835
	15.00	0.02856	0.02859	0.02859
	30.00	0.02898	0.02863	0.02881
	60.00	0.02926	0.02864	0.02916
	120.00	0.02958	0.02864	0.02952
	240.00	0.02997	0.02864	0.02988
	480.00	0.03008	0.02864	0.03024
	1290.00	0.03081	0.02864	0.03074

$h_0 = 0.98850$  in  
 $U_s = 99\%$   
 $t_s = 16.50$  min  
 $d_s = 0.02861$  in  
 $d_0 = 0.02569$  in  
 $d_{100} = 0.02864$  in  
 $d = 0.49217$  in  
 $C_v = 0.0261$  in<sup>2</sup>/min  
 $r_i = 34.5\%$   
 $r_p = 37.7\%$   
 $r_s = 27.8\%$   
 Slope = 0.0012  
 Intercept = 0.0271  
 $h_c = 0.9829$  in  
 $t_c = 21.51$  min  
 $C_{ae} = 0.121\%$

Time-Deformation curve for 2000 psf load  
Time (min)



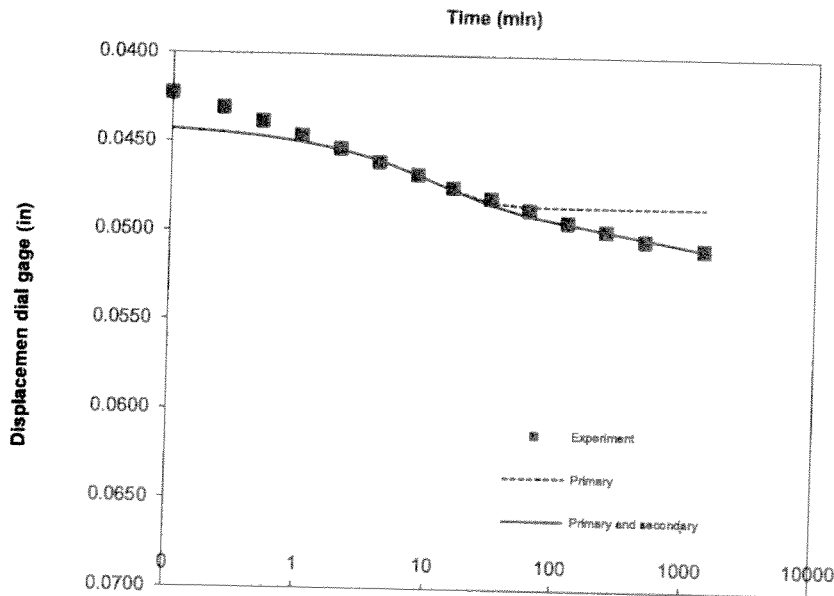
555



Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
4000.0	0.00	0.03246	0.04399	0.04399
	0.10	0.04229	0.04430	0.04430
	0.25	0.04308	0.04448	0.04448
	0.50	0.04386	0.04469	0.04469
	1.00	0.04462	0.04498	0.04498
	2.00	0.04533	0.04539	0.04539
	4.00	0.04606	0.04597	0.04597
	8.00	0.04675	0.04676	0.04676
	15.00	0.04748	0.04759	0.04759
	30.00	0.04806	0.04826	0.04838
	60.00	0.04869	0.04846	0.04899
	120.00	0.04937	0.04848	0.04941
	240.00	0.04981	0.04848	0.04982
	480.00	0.05034	0.04848	0.05022
	1380.00	0.05078	0.04848	0.05084

$h_0 = 0.97904$  in  
 $U_s = 99\%$   
 $t_s = 46.71$  min  
 $d_s = 0.04843$  in  
 $d_0 = 0.04399$  in  
 $d_{100} = 0.04848$  in  
 $d = 0.48263$  in  
 $C_v = 0.0089$  in<sup>2</sup>/min  
 $r_i = 62.9\%$   
 $r_p = 24.5\%$   
 $r_s = 12.6\%$   
 Slope = 0.0014  
 Intercept = 0.0466  
 $h_c = 0.9630$  in  
 $t_c = 24.45$  min  
 $C_{ae} = 0.140\%$

Time-Deformation curve for 4000 psf load

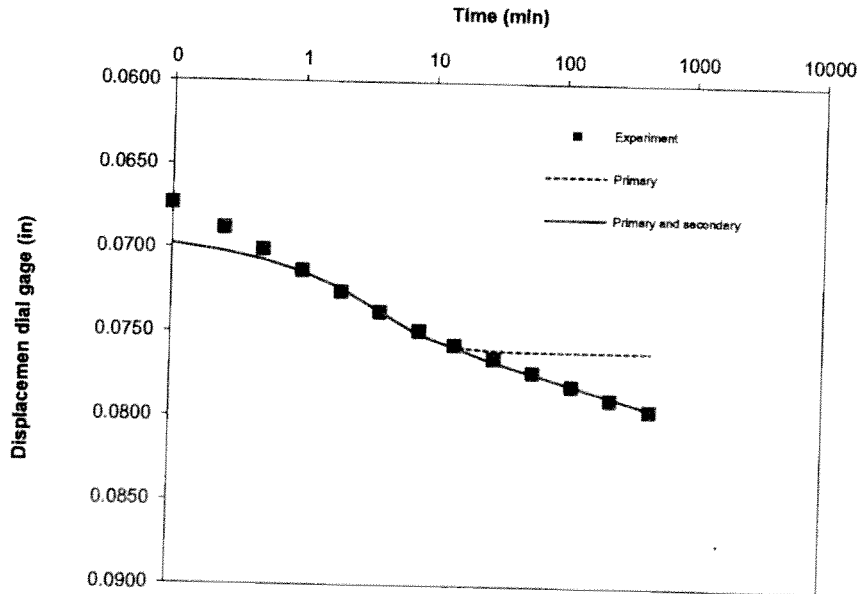




Applied stress psf	Elapsed time min	Dial in	Fitted Primary in	Fitted Primary and Secondary in
8000.0	0.00	0.05807	0.06904	0.06904
	0.10	0.06735	0.06979	0.06979
	0.25	0.06881	0.07023	0.07023
	0.50	0.07007	0.07072	0.07072
	1.00	0.07133	0.07142	0.07142
	2.00	0.07256	0.07241	0.07241
	4.00	0.07374	0.07373	0.07373
	8.00	0.07484	0.07509	0.07509
	15.00	0.07568	0.07582	0.07583
	30.00	0.07647	0.07601	0.07669
	60.00	0.07725	0.07601	0.07737
	120.00	0.07807	0.07601	0.07804
	240.00	0.07883	0.07601	0.07871
	480.00	0.07945	0.07601	0.07938
	1410.00	0.08032	0.07601	0.08043

$h_0 = 0.95343$  in  
 $U_s = 99\%$   
 $t_s = 19.41$  min  
 $d_s = 0.07594$  in  
 $d_0 = 0.06904$  in  
 $d_{100} = 0.07601$  in  
 $d = 0.46949$  in  
 $C_v = 0.0202$  in<sup>2</sup>/min  
 $r_i = 49.3\%$   
 $r_p = 31.3\%$   
 $r_s = 19.4\%$   
Slope = 0.0022  
Intercept = 0.0734  
 $h_c = 0.9355$  in  
 $t_c = 14.83$  min  
 $C_{ae} = 0.239\%$

Time-Deformation curve for 8000 psf load

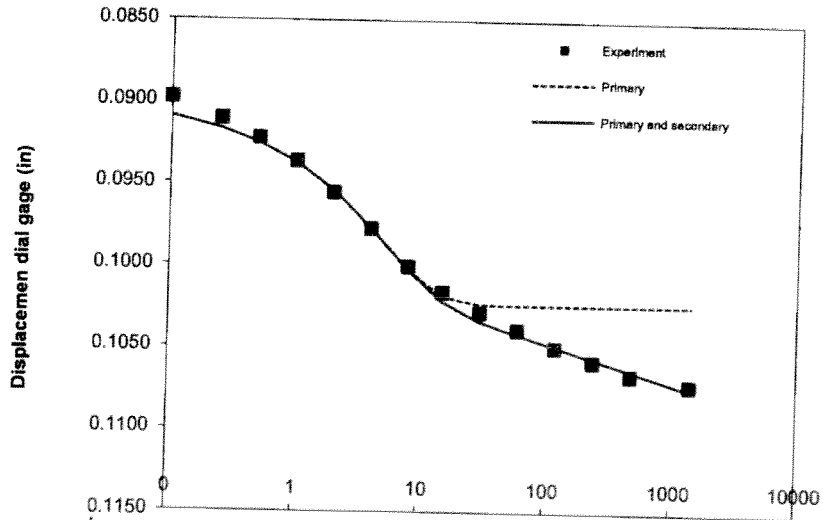




Applied stress psf	Elapsed time min	Dial in	Fitted Primary in	Fitted Primary and Secondary in
16000.0	0.00	0.08475	0.08965	0.08965
	0.10	0.08983	0.09094	0.09094
	0.25	0.09107	0.09170	0.09170
	0.50	0.09224	0.09254	0.09254
	1.00	0.09366	0.09374	0.09374
	2.00	0.09557	0.09544	0.09544
	4.00	0.09777	0.09775	0.09775
	8.00	0.10005	0.10030	0.10030
	15.00	0.10163	0.10187	0.10220
	30.00	0.10286	0.10235	0.10341
	60.00	0.10391	0.10238	0.10416
	120.00	0.10496	0.10238	0.10489
	240.00	0.10580	0.10238	0.10561
	480.00	0.10663	0.10238	0.10634
	1416.00	0.10718	0.10238	0.10747

$h_0 = 0.92675$  in  
 $U_s = 99\%$   
 $t_s = 21.95$  min  
 $d_s = 0.10225$  in  
 $d_0 = 0.08965$  in  
 $d_{100} = 0.10238$  in  
 $d = 0.45774$  in  
 $C_v = 0.0170$  in<sup>2</sup>/min  
 $r_i = 21.8\%$   
 $r_p = 56.7\%$   
 $r_s = 21.4\%$   
 Slope = 0.0024  
 Intercept = 0.0999  
 $h_c = 0.9091$  in  
 $t_c = 10.90$  min  
 $C_{ae} = 0.265\%$

Time-Deformation curve for 16000 psf load  
Time (min)

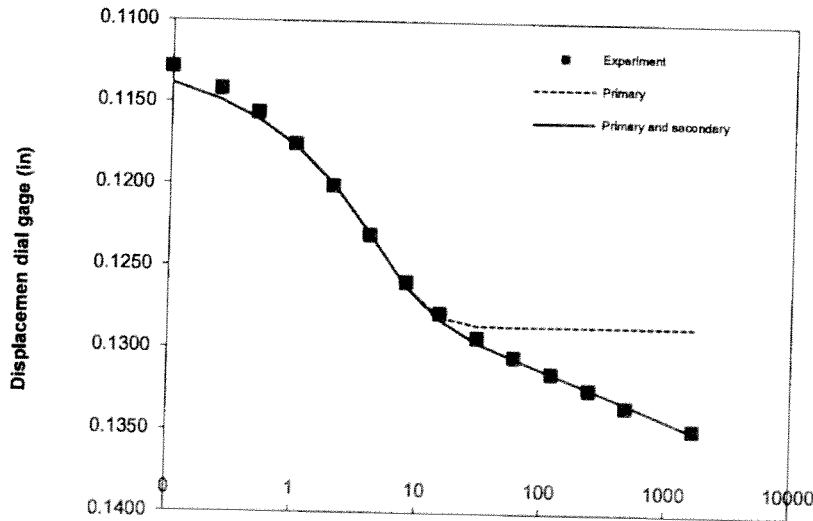




Applied stress psf	Elapsed time min	Dial in	Fitted Primary in	Fitted Primary and Secondary in
32000.0	0.00	0.10949	0.11213	0.11213
	0.10	0.11287	0.11387	0.11387
	0.25	0.11418	0.11489	0.11489
	0.50	0.11562	0.11603	0.11603
	1.00	0.11754	0.11764	0.11764
	2.00	0.12008	0.11992	0.11992
	4.00	0.12307	0.12298	0.12298
	8.00	0.12595	0.12623	0.12623
	15.00	0.12784	0.12806	0.12822
	30.00	0.12931	0.12855	0.12962
	60.00	0.13046	0.12857	0.13055
	120.00	0.13145	0.12857	0.13146
	240.00	0.13242	0.12857	0.13237
	480.00	0.13347	0.12857	0.13328
	1680.00	0.13478	0.12857	0.13492

$h_0 = 0.90201$  in  
 $U_s = 99\%$   
 $t_s = 20.24$  min  
 $d_s = 0.12841$  in  
 $d_0 = 0.11213$  in  
 $d_{100} = 0.12857$  in  
 $d = 0.44557$  in  
 $C_v = 0.0175$  in<sup>2</sup>/min  
 $r_i = 10.5\%$   
 $r_p = 65.0\%$   
 $r_s = 24.6\%$   
Slope = 0.0030  
Intercept = 0.1252  
 $h_c = 0.8829$  in  
 $t_c = 13.30$  min  
 $C_{ee} = 0.342\%$

Time-Deformation curve for 32000 psf load  
Time (min)

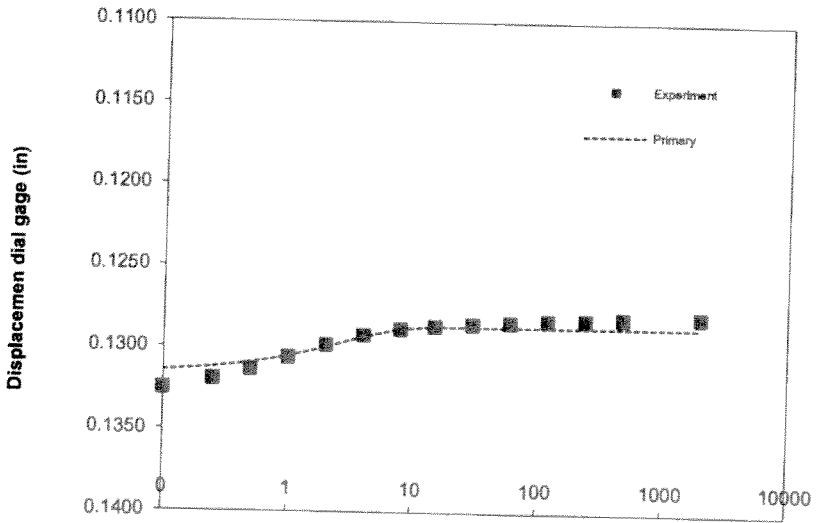




Applied stress psf	Elapsed time min	Dial in	Fitted Primary in	Fitted Primary and Secondary in
8000.0	0.00	0.13421	0.13192	0.13192
	0.10	0.13255	0.13148	0.13148
	0.25	0.13195	0.13123	0.13123
	0.50	0.13135	0.13095	0.13095
	1.00	0.13062	0.13055	0.13055
	2.00	0.12985	0.12998	0.12998
	4.00	0.12923	0.12933	0.12933
	8.00	0.12883	0.12884	0.12884
	15.00	0.12865	0.12869	0.12869
	30.00	0.12852	0.12867	0.12878
	60.00	0.12841	0.12867	0.12893
	120.00	0.12826	0.12867	0.12909
	240.00	0.12823	0.12867	0.12924
	480.00	0.12810	0.12867	0.12940
	2000.00	0.12799	0.12867	0.12972

$h_0 = 0.87729$  in  
 $U_s = 99\%$   
 $t_s = 12.71$  min  
 $d_s = 0.12871$  in  
 $d_0 = 0.13192$  in  
 $d_{100} = 0.12867$  in  
 $d = 0.44060$  in  
 $C_v = 0.0272$  in<sup>2</sup>/min  
 $r_i = 36.9\%$   
 $r_p = 52.2\%$   
 $r_s = 11.0\%$   
 Slope = -0.0005  
 Intercept = 0.1293  
 $h_c = 0.8828$  in  
 $t_c = 18.60$  min  
 $C_{as} = 0.058\%$

Time-Deformation curve for 8000 psf unload  
Time (min)

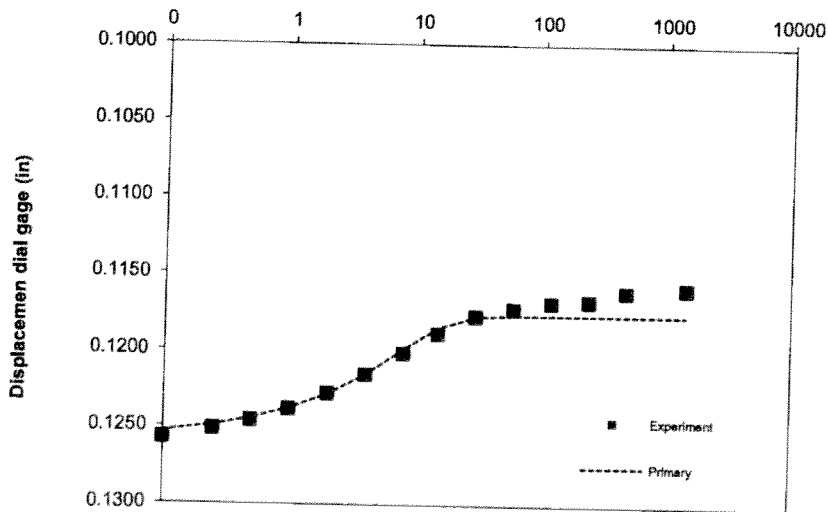




Applied stress psf	Elapsed time min	Dial in	Fitted Primary in	Fitted Primary and Secondary in
2000.0	0.00	0.12781	0.12604	0.12604
	0.10	0.12574	0.12533	0.12533
	0.25	0.12514	0.12492	0.12492
	0.50	0.12459	0.12446	0.12446
	1.00	0.12383	0.12380	0.12383
	2.00	0.12283	0.12287	0.12307
	4.00	0.12158	0.12156	0.12192
	8.00	0.12018	0.11990	0.12043
	15.00	0.11890	0.11849	0.11917
	30.00	0.11775	0.11773	0.11858
	60.00	0.11722	0.11762	0.11864
	120.00	0.11680	0.11762	0.11881
	240.00	0.11670	0.11762	0.11898
	480.00	0.11610	0.11762	0.11914
	1440.00	0.11583	0.11762	0.11941

$h_0 = 0.88369$  in  
 $U_s = 99\%$   
 $t_s = 31.99$  min  
 $d_s = 0.11770$  in  
 $d_0 = 0.12604$  in  
 $d_{100} = 0.11762$  in  
 $d = 0.44483$  in  
 $C_v = 0.0110$  in<sup>2</sup>/min  
 $r_i = 14.7\%$   
 $r_p = 70.3\%$   
 $r_s = 14.9\%$   
 Slope = -0.0006  
 Intercept = 0.1176  
 $h_c = 0.8939$  in  
 $t_c = 0.89$  min  
 $C_{ae} = 0.062\%$

Time-Deformation curve for 2000 psf unload  
Time (min)



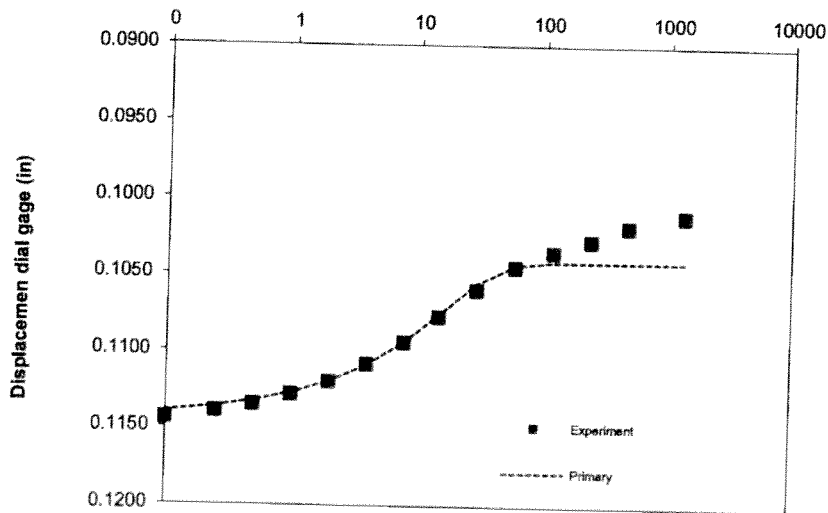




Applied stress psf	Elapsed time min	Dial in	Fitted Primary in	Fitted Primary and Secondary in
500.0	0.00	0.11520	0.11456	0.11456
	0.10	0.11442	0.11399	0.11399
	0.25	0.11398	0.11365	0.11365
	0.50	0.11350	0.11327	0.11327
	1.00	0.11287	0.11273	0.11273
	2.00	0.11201	0.11198	0.11198
	4.00	0.11085	0.11090	0.11090
	8.00	0.10941	0.10939	0.10939
	15.00	0.10773	0.10759	0.10759
	30.00	0.10598	0.10553	0.10553
	60.00	0.10446	0.10433	0.10433
	120.00	0.10346	0.10409	0.10470
	240.00	0.10273	0.10408	0.10543
	480.00	0.10181	0.10408	0.10616
	1356.00	0.10108	0.10408	0.10726

$h_0 = 0.89630$  in  
 $U_s = 99\%$   
 $t_s = 74.46$  min  
 $d_s = 0.10418$  in  
 $d_0 = 0.11456$  in  
 $d_{100} = 0.10408$  in  
 $d = 0.45109$  in  
 $C_v = 0.0049$  in<sup>2</sup>/min  
 $r_f = 4.5\%$   
 $r_p = 74.2\%$   
 $r_s = 21.2\%$   
 Slope = -0.0024  
 Intercept = 0.1085  
 $h_c = 0.9074$  in  
 $t_c = 67.05$  min  
 $C_{ae} = 0.269\%$

Time-Deformation curve for 500 psf unload  
Time (min)





## Isotropically Consolidated-Undrained Triaxial Compression Test (AASHTO T 297/ASTM D 4767)

<b>Project:</b> Patrick Engineering; Washington Street <b>Sample ID:</b> Boring B-22, 26' to 28' <b>Sample description:</b> Gray SI CLAY <b>Triaxial Cell No.:</b> 1 <b>Initial sample height:</b> 5.80 in <b>Initial sample diameter:</b> 2.86 in <b>Initial sample mass:</b> 1367.30 g <b>Soil specific gravity:</b> 2.76 (estimated) <b>Dry sample mass:</b> 1181.80 g <b>Final sample mass:</b> 1365.30 g <b>Initial water content:</b> 15.70% (specimen) <b>Initial unit weight:</b> 139.97 pcf <b>Initial dry unit weight:</b> 120.98 pcf <b>Initial void ratio:</b> 0.424 <b>Initial saturation:</b> 100.0% <b>Final water content:</b> 15.53% (specimen) <b>Liquid Limit, %:</b> N/A <b>Plastic Limit, %:</b> N/A <b>% Sand:</b> N/A <b>% Silt:</b> N/A <b>% Clay:</b> N/A	<b>Tested by:</b> M. Snider <b>Prepared by:</b> M. Snider <b>Test date:</b> November 22, 2011 <b>WEI Job No.:</b> 190-27-12 <b>Tare mass:</b> 187.20 g <b>Measured sample mass w/out Tare:</b> 1367.30 g <b>Tare and final sample mass:</b> 1552.50 g <b>Tare and dry sample mass:</b> 1369.00 g  <b>Saturation (B) coefficient:</b> 99% <b>Rate of loading:</b> 0.025 %/min <b>Volume change during consolidation:</b> 0.78 in <sup>3</sup> <b>Void ratio after consolidation:</b> 0.394 <b>Dry unit weight after consolidation:</b> 123.58 pcf <b>Height after consolidation:</b> 5.76 in <b>Volume after consolidation:</b> 36.43 in <sup>3</sup> <b>Area after consolidation:</b> 6.33 in <sup>2</sup> <b>Time at 50% Consolidation:</b> 96.61 min  <b>Effective consolidation stress:</b> 25.0 psi <b>Shear modulus:</b> 939.37 psi
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Axial displacement (Δh)	Axial force (F)	Pore pressure (u)	Axial strain (εps)	Deviator stress	Total vertical stress	Effective vertical stress	Effective horizontal stress	Shear stress, q=q'	Effective spherical stress, p'	Total spherical stress, p	Effective Principal Stress Ratio
in	pound	psi	%	psi	psi	psi	psi	psi	psi	psi	psi
0.00	0.000	0.0	0.00	0.0	25.0	25.0	25.00	0.00	25.00	25.00	1.00
0.01	36.554	2.3	0.10	5.8	30.8	28.5	22.71	2.88	25.59	27.88	1.25
0.01	71.454	5.7	0.20	11.3	36.3	30.6	19.32	5.63	24.96	30.63	1.58
0.02	91.019	7.7	0.30	14.3	39.3	31.6	17.26	7.17	24.43	32.17	1.83
0.02	105.216	9.2	0.40	16.6	41.6	32.4	15.83	8.28	24.11	33.28	2.05
0.03	116.405	10.1	0.50	18.3	43.3	33.2	14.88	9.15	24.03	34.15	2.23
0.03	126.497	10.8	0.60	19.9	44.9	34.0	14.15	9.93	24.09	34.93	2.40
0.04	135.457	11.4	0.70	21.3	46.3	34.9	13.62	10.63	24.24	35.63	2.56
0.05	143.539	11.8	0.80	22.5	47.5	35.7	13.24	11.25	24.49	36.25	2.70
0.05	151.267	12.0	0.90	23.7	48.7	36.7	12.97	11.84	24.81	36.84	2.83
0.06	158.518	12.2	1.00	24.8	49.8	37.6	12.78	12.40	25.18	37.40	2.94
0.09	187.986	12.3	1.50	29.3	54.3	41.9	12.67	14.63	27.30	39.63	3.31
0.12	209.807	11.7	2.00	32.5	57.5	45.7	13.25	16.24	29.50	41.24	3.45
0.14	224.716	11.0	2.50	34.6	59.6	48.6	14.03	17.31	31.34	42.31	3.47
0.17	238.135	10.2	3.00	36.5	61.5	51.3	14.81	18.25	33.05	43.25	3.46
0.20	252.241	9.4	3.50	38.5	63.5	54.1	15.61	19.23	34.84	44.23	3.46
0.23	262.971	8.6	4.00	39.9	64.9	56.3	16.40	19.94	36.34	44.94	3.43
0.26	271.590	7.9	4.50	41.0	66.0	58.1	17.13	20.49	37.62	45.49	3.39
0.29	281.244	7.1	5.00	42.2	67.2	60.1	17.90	21.11	39.00	46.11	3.36
0.32	288.773	6.4	5.50	43.1	68.1	61.7	18.60	21.56	40.16	46.56	3.32
0.35	293.101	5.7	6.00	43.5	68.5	62.8	19.26	21.76	41.03	46.76	3.26
0.38	298.979	5.1	6.50	44.2	69.2	64.0	19.86	22.08	41.94	47.08	3.22
0.41	304.856	4.6	7.00	44.8	69.8	65.2	20.36	22.40	42.76	47.40	3.20
0.43	310.275	4.2	7.50	45.3	70.3	66.2	20.82	22.67	43.49	47.67	3.18
0.46	313.778	3.7	8.00	45.6	70.6	66.9	21.26	22.80	44.06	47.80	3.15
0.49	318.337	3.4	8.50	46.0	71.0	67.7	21.63	23.01	44.64	48.01	3.13
0.52	322.082	3.0	9.00	46.3	71.3	68.3	22.03	23.15	45.18	48.15	3.10
0.55	325.488	2.7	9.50	46.5	71.5	68.9	22.33	23.27	45.60	48.27	3.08
0.58	330.120	2.4	10.00	46.9	71.9	69.6	22.61	23.47	46.08	48.47	3.08
0.64	335.702	1.9	11.00	47.2	72.2	70.3	23.11	23.60	46.71	48.60	3.04
0.70	341.773	1.5	12.00	47.5	72.5	71.0	23.50	23.76	47.26	48.76	3.02
0.75	348.513	1.2	13.00	47.9	72.9	71.7	23.83	23.95	47.78	48.95	3.01
0.81	355.094	0.9	14.00	48.2	73.2	72.4	24.13	24.12	48.26	49.12	3.00
0.85	359.023	0.7	14.68	48.4	73.4	72.7	24.33	24.20	48.52	49.20	2.99

Notes:

$p = \sigma_1 + \sigma_3 / 2$      $q = \sigma_1 - \sigma_3 / 2$   
 $p' = \sigma_1' + \sigma_3' / 2$      $q' = \sigma_1' - \sigma_3' / 2$   
 Wet Method Saturation

Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Checked by: \_\_\_\_\_ Date: \_\_\_\_\_

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## Isotropically Consolidated-Undrained Triaxial Compression Test (AASHTO T 297/ASTM D 4767)

<b>Project:</b> Patrick Engineering; Washington Street <b>Sample ID:</b> Boring B-22, 26' to 28' <b>Sample description:</b> Gray SI CLAY <b>Triaxial Cell No.:</b> 2 <b>Initial sample height:</b> 6.09 in <b>Initial sample diameter:</b> 2.85 in <b>Initial sample mass:</b> 1426.10 g <b>Soil specific gravity:</b> 2.76 (estimated) <b>Dry sample mass:</b> 1221.85 g <b>Final sample mass:</b> 1415.65 g <b>Initial water content:</b> 16.72% (specimen) <b>Initial unit weight:</b> 140.00 pcf <b>Initial dry unit weight:</b> 119.95 pcf <b>Initial void ratio:</b> 0.436 <b>Initial saturation:</b> 100.0% <b>Final water content:</b> 15.88% (specimen) <b>Liquid Limit, %:</b> N/A <b>Plastic Limit, %:</b> N/A <b>% Sand:</b> N/A <b>% Silt:</b> N/A <b>% Clay:</b> N/A	<b>Tested by:</b> M. Snider <b>Prepared by:</b> M. Snider <b>Test date:</b> November 22, 2011 <b>WEI Job No.:</b> 190-27-12 <b>Tare mass:</b> 13.35 g <b>Measured sample mass w/out Tare:</b> 1426.10 g <b>Tare and final sample mass:</b> 1429.00 g <b>Tare and dry sample mass:</b> 1235.20 g  <b>Saturation (B) coefficient:</b> 99% <b>Rate of loading:</b> 0.025 %/min <b>Volume change during consolidation:</b> 1.11 in <sup>3</sup> <b>Void ratio after consolidation:</b> 0.395 <b>Dry unit weight after consolidation:</b> 123.48 pcf <b>Height after consolidation:</b> 6.03 in <b>Volume after consolidation:</b> 37.70 in <sup>3</sup> <b>Area after consolidation:</b> 6.25 in <sup>2</sup> <b>Time at 50% Consolidation:</b> 73.26 min  <b>Effective consolidation stress:</b> 40.0 psi <b>Shear modulus:</b> 1127.25 psi
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Axial displacement (Δh)	Axial force (F)	Pore pressure (u)	Axial strain (εps)	Deviator stress	Total vertical stress	Effective vertical stress	Effective horizontal stress	Shear stress, q=q'	Effective spherical stress, p'	Total spherical stress, p	Effective Principal Stress Ratio
in	pound	psi	%	psi	psi	psi	psi	psi	psi	psi	psi
0.00	0.000	0.0	0.00	0.0	40.0	40.0	40.00	0.00	40.00	40.00	1.00
0.01	33.670	1.8	0.10	5.4	45.4	43.6	38.24	2.69	40.93	42.69	1.14
0.01	84.745	6.0	0.20	13.5	53.5	47.6	34.04	6.77	40.81	46.77	1.40
0.02	107.736	8.7	0.30	17.2	57.2	48.4	31.25	8.60	39.85	48.60	1.55
0.02	123.346	10.8	0.40	19.7	59.7	48.8	29.15	9.83	38.99	49.83	1.67
0.03	134.328	12.3	0.50	21.4	61.4	49.1	27.70	10.70	38.40	50.70	1.77
0.04	145.878	13.7	0.60	23.2	63.2	49.5	26.32	11.60	37.92	51.60	1.88
0.04	156.089	14.8	0.70	24.8	64.8	50.0	25.20	12.40	37.61	52.40	1.98
0.05	165.282	15.7	0.80	26.2	66.2	50.5	24.27	13.12	37.39	53.12	2.08
0.05	173.840	16.5	0.90	27.6	67.6	51.1	23.51	13.79	37.29	53.79	2.17
0.06	181.926	17.2	1.00	28.8	68.8	51.6	22.81	14.41	37.22	54.41	2.26
0.09	215.959	19.2	1.50	34.0	74.0	54.8	20.78	17.02	37.81	57.02	2.64
0.12	239.818	19.7	2.00	37.6	77.6	57.9	20.32	18.81	39.13	58.81	2.85
0.15	256.048	18.4	2.50	41.9	81.9	63.0	21.16	20.94	42.10	60.94	2.98
0.18	269.897	18.8	3.00	43.2	83.2	65.0	21.76	21.62	43.38	61.62	2.99
0.21	279.954	18.2	3.50	44.8	84.8	67.0	22.46	22.28	44.74	62.28	2.98
0.24	290.014	17.5	4.00	44.6	84.6	67.0	22.46	22.28	44.74	62.28	2.98
0.27	298.264	16.9	4.50	45.6	85.6	68.7	23.13	22.80	45.93	62.80	2.97
0.30	306.465	16.2	5.00	46.6	86.6	70.4	23.78	23.30	47.08	63.30	2.96
0.34	312.569	15.6	5.50	47.3	87.3	71.7	24.38	23.64	48.02	63.64	2.94
0.37	318.804	15.0	6.00	47.9	87.9	72.9	24.98	23.97	48.95	63.97	2.92
0.40	324.757	14.5	6.50	48.6	88.6	74.1	25.46	24.30	49.76	64.30	2.91
0.43	330.632	14.2	7.00	49.2	89.2	75.1	25.85	24.61	50.45	64.61	2.90
0.46	335.691	13.6	7.50	49.7	89.7	76.1	26.44	24.85	51.29	64.85	2.88
0.49	340.911	13.0	8.00	50.2	90.2	77.2	26.95	25.10	52.05	65.10	2.86
0.52	345.175	12.6	8.50	50.6	90.6	78.0	27.41	25.28	52.68	65.28	2.84
0.55	348.862	12.2	9.00	50.8	90.8	78.7	27.84	25.41	53.24	65.41	2.83
0.58	353.235	11.8	9.50	51.2	91.2	79.4	28.21	25.58	53.79	65.58	2.81
0.61	357.469	11.6	10.00	51.5	91.5	79.9	28.45	25.75	54.19	65.75	2.81
0.67	363.914	11.0	11.00	51.8	91.8	80.9	29.05	25.92	54.97	65.92	2.78
0.73	369.217	10.4	12.00	52.0	92.0	81.6	29.60	26.00	55.60	66.00	2.76
0.79	374.956	10.1	13.00	52.2	92.2	82.1	29.87	26.11	55.98	66.11	2.75
0.85	378.377	9.8	14.00	52.1	92.1	82.3	30.21	26.04	56.26	66.04	2.72
0.91	382.408	9.5	15.00	52.0	92.0	82.6	30.54	26.01	56.55	66.01	2.70

Notes:

$p = \sigma_1 + \sigma_3 / 2$        $q = \sigma_1 - \sigma_3 / 2$

$p' = \sigma_1' + \sigma_3' / 2$        $q' = \sigma_1' - \sigma_3' / 2$

Wet Method Saturation

Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_



## Isotropically Consolidated-Undrained Triaxial Compression Test (AASHTO T 297/ASTM D 4767)

<b>Project:</b> Patrick Engineering; Washington Street <b>Sample ID:</b> Boring B-22, 26' to 28' <b>Sample description:</b> Gray SI CLAY <b>Triaxial Cell No.:</b> 3 Initial sample height: 6.01 in Initial sample diameter: 2.85 in Initial sample mass: 1405.80 g Soil specific gravity: 2.78 (estimated) Dry sample mass: 1198.30 g Final sample mass: 1394.40 g Initial water content: 17.32% (specimen) Initial unit weight: 139.97 pcf Initial dry unit weight: 119.31 pcf Initial void ratio: 0.454 Initial saturation: 100.0% Final water content: 16.36% (specimen) Liquid Limit, %: N/A Plastic Limit, %: N/A % Sand: N/A % Silt: N/A % Clay: N/A	<b>Tested by:</b> M. Snider <b>Prepared by:</b> M. Snider <b>Test date:</b> November 22, 2011 <b>WEI Job No.:</b> 190-27-12 Tare mass: 13.90 g Measured sample mass w/out Tare: 1405.80 g Tare and final sample mass: 1408.30 g Tare and dry sample mass: 1212.20 g Saturation (B) coefficient: 99% Rate of loading: 0.025 %/min Volume change during consolidation: 1.66 in <sup>3</sup> Void ratio after consolidation: 0.391 Dry unit weight after consolidation: 124.73 pcf Height after consolidation: 5.93 in Volume after consolidation: 36.60 in <sup>3</sup> Area after consolidation: 6.17 in <sup>2</sup> Time at 50% Consolidation: 178.63 min Effective consolidation stress: 55.0 psi Shear modulus: 1686.64 psi
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Axial displacement (Δh)	Axial force (F)	Pore pressure (u)	Axial strain (ε <sub>h</sub> )	Deviator stress	Total vertical stress	Effective vertical stress	Effective horizontal stress	Shear stress, q=q'	Effective spherical stress, p'	Total spherical stress, p	Effective Principal Stress Ratio
in	pound	psi	%	psi	psi	psi	psi	psi	psi	psi	psi
0.00	0.000	0.0	0.00	0.0	55.0	55.00	55.00	0.00	55.00	55.00	1.00
0.01	87.610	3.9	0.10	14.2	69.2	65.3	51.09	7.09	58.18	62.09	1.28
0.01	124.477	8.1	0.20	20.1	75.1	67.1	46.94	10.06	57.00	65.06	1.43
0.02	147.568	11.1	0.30	23.8	78.8	67.7	43.88	11.91	55.79	66.91	1.54
0.02	165.043	13.7	0.40	26.6	81.6	67.9	41.29	13.31	54.60	68.31	1.64
0.03	179.464	15.7	0.50	28.9	83.9	68.3	39.33	14.46	53.79	69.46	1.74
0.04	191.881	17.2	0.60	30.9	85.9	68.7	37.82	15.45	53.27	70.45	1.82
0.04	202.855	18.8	0.70	32.6	87.6	68.8	36.21	16.31	52.52	71.31	1.90
0.05	212.869	19.9	0.80	34.2	89.2	69.3	35.05	17.10	52.15	72.10	1.98
0.05	222.041	21.0	0.90	35.6	90.6	69.6	33.98	17.82	51.79	72.82	2.05
0.06	230.872	21.9	1.00	37.0	92.0	70.1	33.12	18.51	51.63	73.51	2.12
0.09	266.029	24.8	1.50	42.4	97.4	72.6	30.16	21.22	51.38	76.22	2.41
0.12	293.245	26.2	2.00	46.5	101.5	75.4	28.82	23.27	52.09	78.27	2.62
0.15	314.401	26.6	2.50	49.6	104.6	78.1	28.43	24.82	53.25	79.82	2.75
0.18	332.650	26.3	3.00	52.3	107.3	81.0	28.71	26.13	54.84	81.13	2.82
0.21	347.139	26.0	3.50	54.3	109.3	83.3	29.02	27.13	56.14	82.13	2.87
0.24	360.391	25.5	4.00	56.0	111.0	85.6	29.52	28.02	57.54	83.02	2.90
0.27	371.854	24.9	4.50	57.5	112.5	87.6	30.10	28.76	58.86	83.76	2.91
0.30	380.850	24.2	5.00	58.6	113.6	89.4	30.79	29.30	60.09	84.30	2.90
0.33	393.108	23.5	5.50	60.2	115.2	91.7	31.50	30.08	61.58	85.08	2.91
0.36	402.779	22.8	6.00	61.3	116.3	93.5	32.15	30.66	62.81	85.66	2.91
0.39	410.276	22.2	6.50	62.1	117.1	94.9	32.78	31.06	63.85	86.06	2.90
0.42	415.721	21.6	7.00	62.6	117.6	96.0	33.40	31.31	64.71	86.31	2.87
0.45	421.317	20.8	7.50	63.1	118.1	97.3	34.16	31.56	65.72	86.56	2.85
0.48	424.569	20.4	8.00	63.3	118.3	97.8	34.58	31.63	66.21	86.63	2.83
0.51	429.697	19.9	8.50	63.7	118.7	98.8	35.09	31.84	66.93	86.84	2.81
0.54	435.204	19.4	9.00	64.1	119.1	99.7	35.58	32.07	67.65	87.07	2.80
0.57	436.925	19.0	9.50	64.0	119.0	100.1	36.01	32.02	68.03	87.02	2.78
0.60	438.575	18.6	10.00	63.9	118.9	100.3	36.38	31.96	68.34	86.96	2.76
0.66	438.112	18.1	11.00	63.1	118.1	100.1	36.91	31.57	68.48	86.57	2.71
0.72	447.553	17.7	12.00	63.8	118.8	101.1	37.34	31.89	69.23	86.89	2.71
0.78	457.861	17.4	13.00	64.5	119.5	102.1	37.58	32.26	69.84	87.26	2.72
0.84	466.533	17.0	14.00	65.0	120.0	103.0	37.98	32.49	70.47	87.49	2.71
0.90	475.050	16.8	14.95	65.4	120.4	103.6	38.21	32.72	70.93	87.72	2.71

Notes:

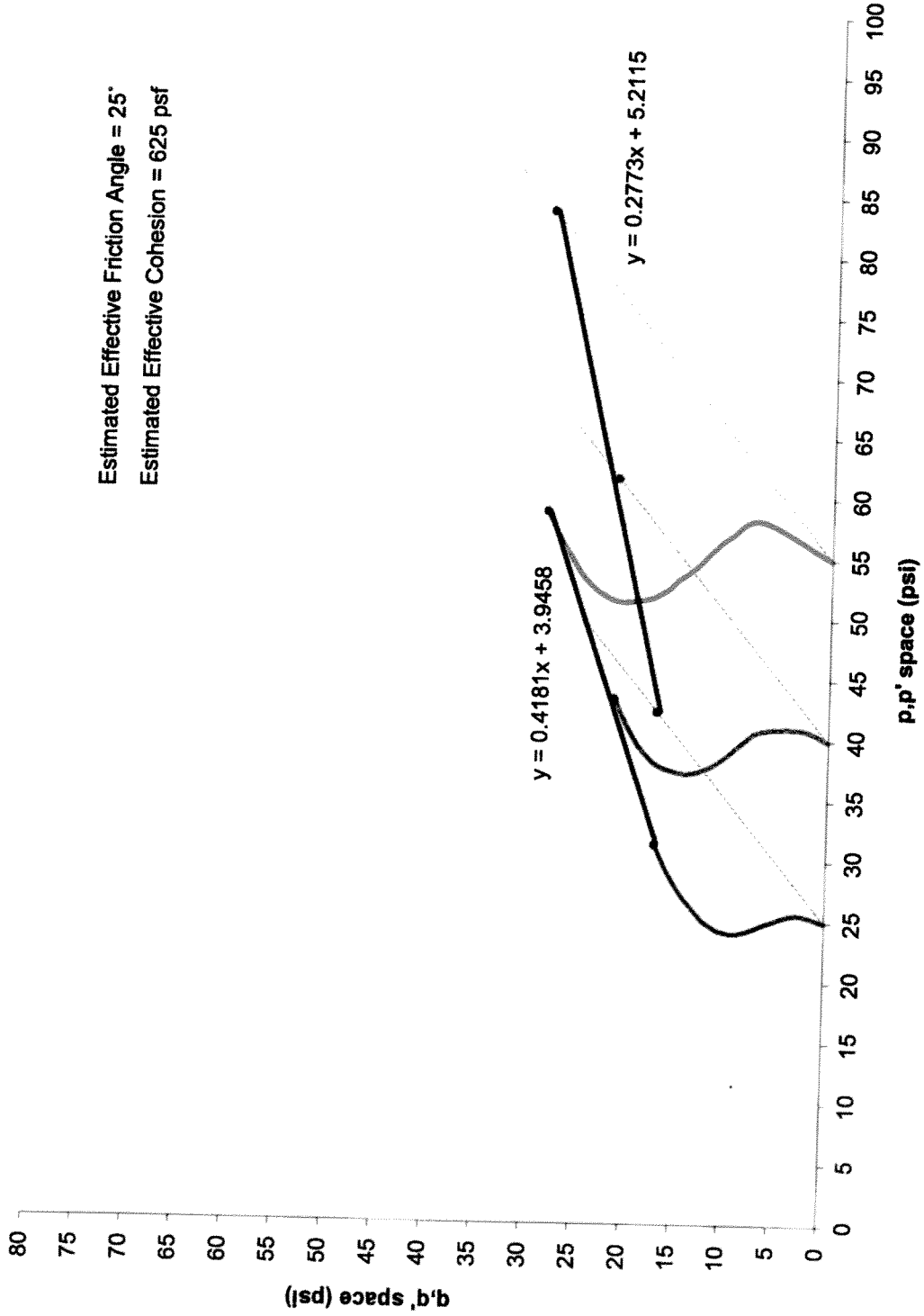
$p = \sigma_1 + \sigma_3 / 2$      $q = \sigma_1 - \sigma_3 / 2$   
 $p' = \sigma'_1 + \sigma'_3 / 2$      $q' = \sigma'_1 - \sigma'_3 / 2$   
 Wet Method Saturation

Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Checked by: \_\_\_\_\_ Date: \_\_\_\_\_

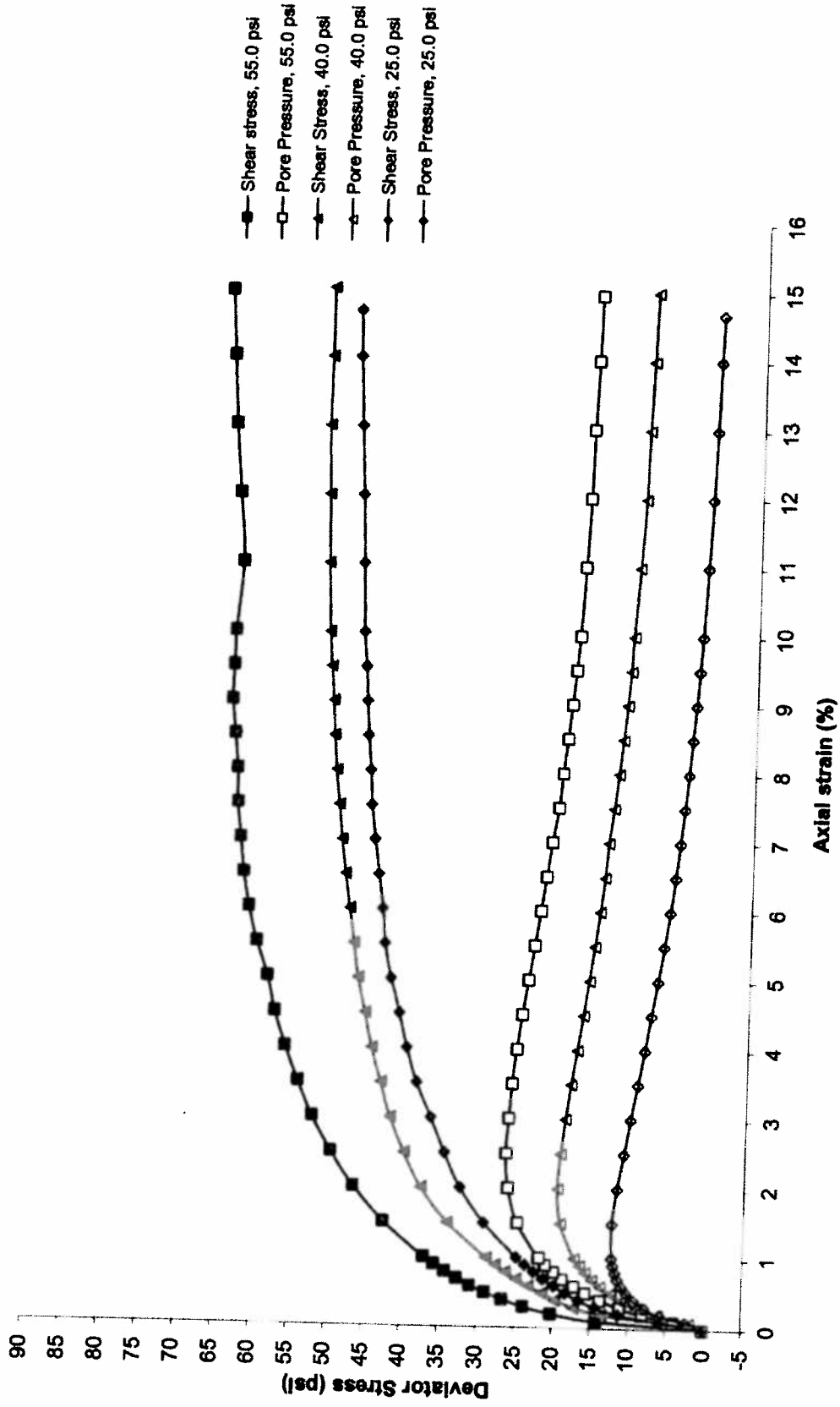
567

**Triaxial Compression Total and Effective Stress Paths at Failure (p-q Space)**  
**Maximum Shear Stress Ratio, Sample B-22, 26' to 28'**

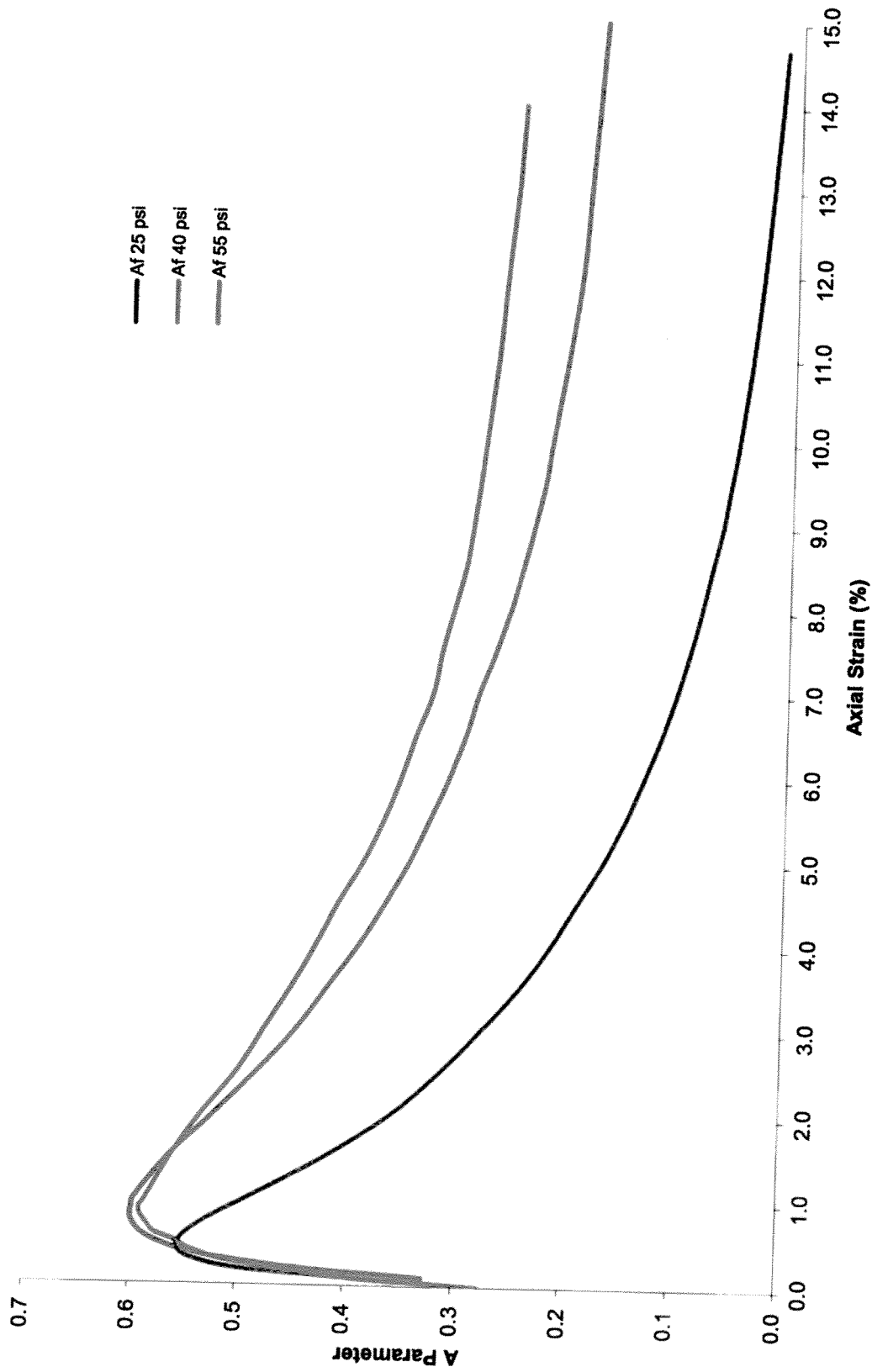
Estimated Effective Friction Angle = 25°  
 Estimated Effective Cohesion = 625 psf



Sample B-22, 26' to 28': Stress v. Strain and Pore Pressure v. Strain Curves  
All Confining Pressures



**A-Parameter During Shearing  
Sample B-22, 26' to 28'**





# CONSOLIDATION TEST (ASTM D 2435, AASHTO T 216)

**Project:** Patrick Engineering; Washington Street  
**Sample ID:** Boring B-22, 26' to 28'  
**Sample description:** Gray SI CLAY

Tested by: WEI Laboratory  
 Prepared by: M. Snider  
 Test date: Nov-11  
 WEI: 190-27-12  
 Ring diameter = 2.499 in  
 Ring mass = 109.92 g  
 Initial sample and ring mass = 284.06 g  
 Tare mass = 13.93 g  
 Final ring and sample mass = 282.66 g  
 Mass of wet sample and tare = 186.46 g  
 Mass of dry sample and tare = 162.95 g  
 Initial dial reading = 0.01000 in  
 Final dial reading = 0.06622 in  
 LL= NA  
 PL= NA  
 % Sand= NA  
 % Silt= NA  
 % Clay= NA

Initial sample height = 1.001 in  
 Initial sample mass = 174.14 g  
 Initial water content = 16.86%  
 Initial dry unit weight = 115.63 pcf  
 Initial void ratio = 0.468  
 Initial degree of saturation = 97.99%  
 Final sample mass = 172.53 g  
 Final dry sample mass = 149.02 g  
 Final water content = 15.78%  
 Final dry unit weight = 122.50 pcf  
 Final void ratio = 0.385  
 Final degree of saturation = 100.00%  
 Estimated specific gravity = 2.72

**In-Situ Vertical Effective Stress = 3000 psf**

**Compression and Swelling Indices**

Compression index  $C_c = 0.113$   
 Field corrected  $C_c = 0.127$   
 Swelling index  $C_s = 0.029$

**Preconsolidation pressure,  $\sigma_c$**

Casagrande Method = 4994 psf

**Over-Consolidation Ratio (OCR) = 1.66**

Load number	Vertical stress psf	Dial reading in	System deflection in	Vertical strain %	Void ratio	$C_v$ ft <sup>2</sup> /day	$C_{\alpha e}$ %	Elapsed time min
1	100.0	0.00644	0.00010	-0.35	0.473	N/A	N/A	1350
2	200.0	0.00721	0.00023	-0.26	0.472	0.0163	0.03	1500
3	500.0	0.01039	0.00058	0.10	0.466	0.1323	0.07	1650
4	1000.0	0.01603	0.00090	0.69	0.458	0.1054	0.11	1476
5	2000.0	0.02491	0.00135	1.62	0.444	0.1196	0.08	1290
6	4000.0	0.03580	0.00193	2.77	0.427	0.1266	0.10	1380
7	8000.0	0.04954	0.00253	4.20	0.406	0.1361	0.18	1410
8	16000.0	0.06900	0.00324	6.22	0.377	0.1033	0.19	1416
9	32000.0	0.09139	0.00413	8.54	0.343	0.0261	0.28	1680
10	8000.0	0.08950	0.00295	8.24	0.347	N/A	N/A	2400
11	2000.0	0.07905	0.00198	7.09	0.364	N/A	N/A	1440
11	500.0	0.06772	0.00123	5.89	0.381	N/A	N/A	1350

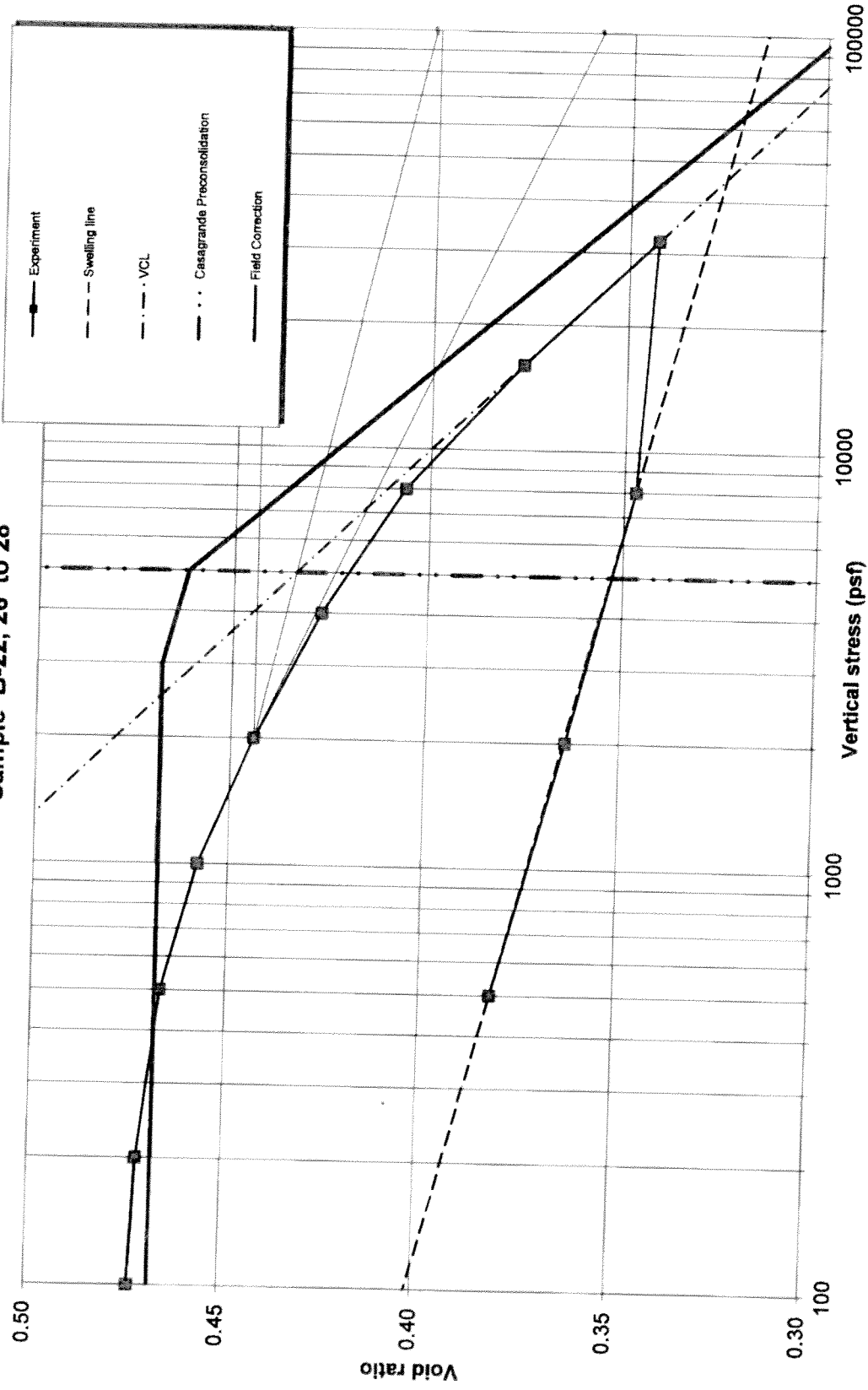
Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_



# CONSOLIDATION CURVE

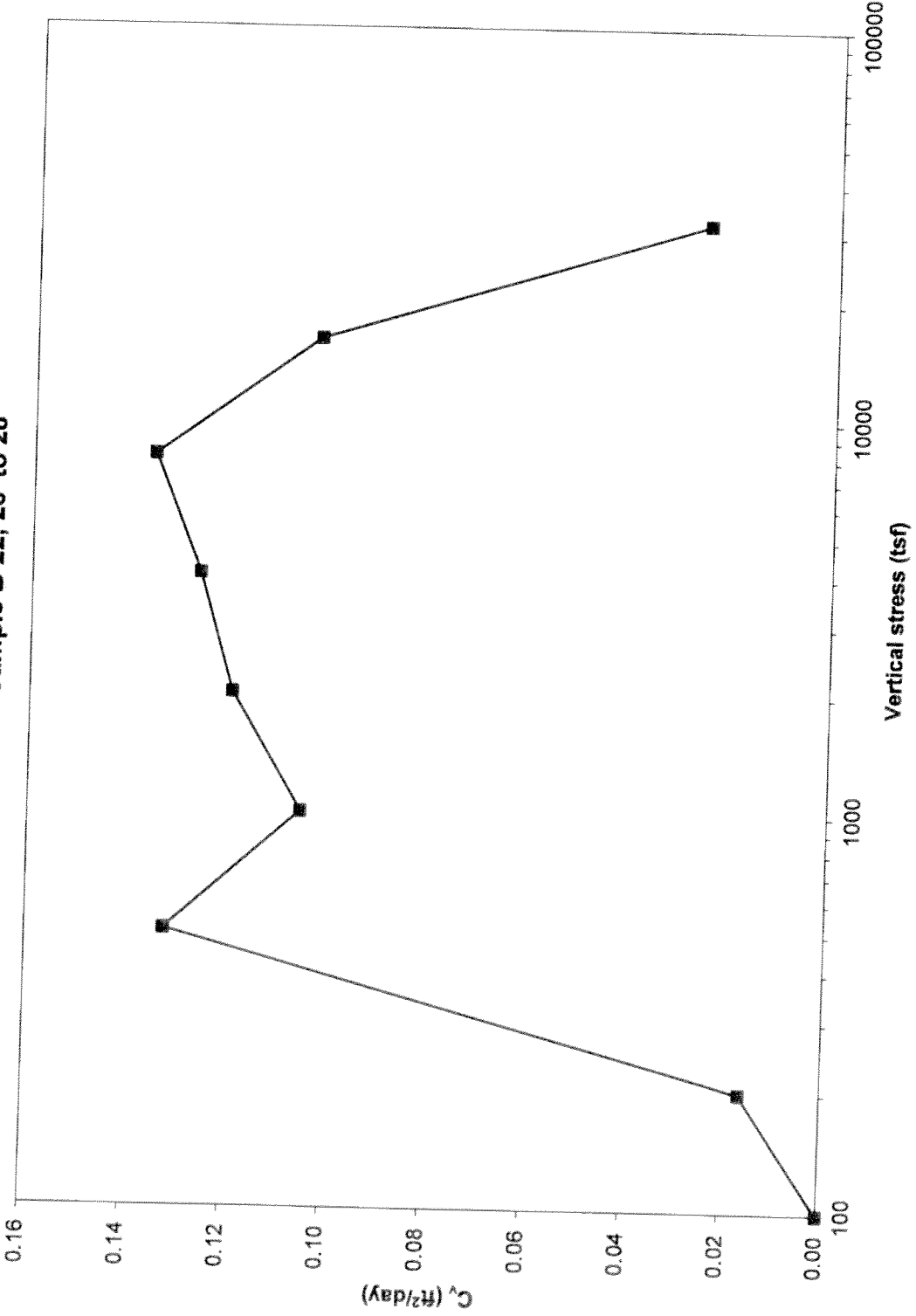
Sample B-22, 26' to 28'



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# CONSOLIDATION COEFFICIENT ( $C_v$ ) vs. VERTICAL STRESS

Sample B-22, 26' to 28'



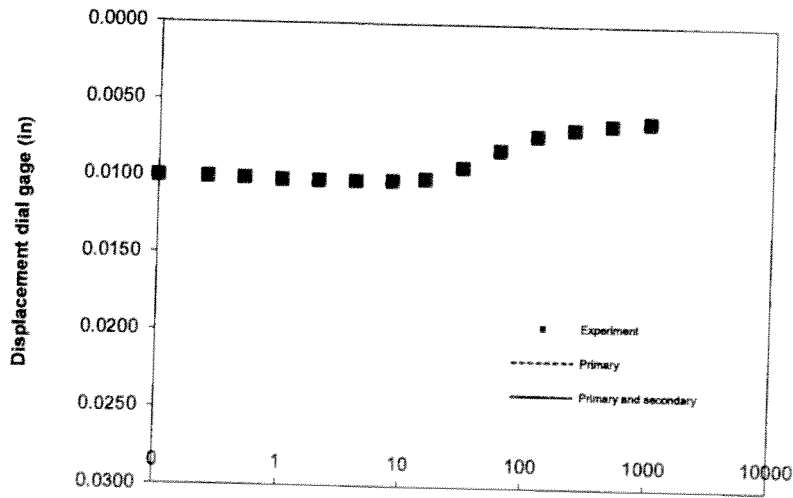
573



Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
50.0	0.00	0.01000	#VALUE!	#VALUE!
	0.10	0.01002	#VALUE!	#VALUE!
	0.25	0.01006	#VALUE!	#VALUE!
	0.50	0.01013	#VALUE!	#VALUE!
	1.00	0.01023	#VALUE!	#VALUE!
	2.00	0.01026	#VALUE!	#VALUE!
	4.00	0.01026	#VALUE!	#VALUE!
	8.00	0.01025	#VALUE!	#VALUE!
	15.00	0.01009	#VALUE!	#VALUE!
	30.00	0.00930	#VALUE!	#VALUE!
	60.00	0.00816	#VALUE!	#VALUE!
	120.00	0.00720	#VALUE!	#VALUE!
	240.00	0.00673	#VALUE!	#VALUE!
	480.00	0.00645	#VALUE!	#VALUE!
	979.80	0.00624	#VALUE!	#VALUE!

$h_0 = 1.00120$  in  
 $U_s = 99\%$   
 $t_s = \#VALUE!$  min  
 $d_s = \#VALUE!$  in  
 $d_0 = \#VALUE!$  in  
 $d_{100} = \#VALUE!$  in  
 $d = \#VALUE!$  in  
 $C_v = \#VALUE!$  in<sup>2</sup>/min  
 $r_i = \#VALUE!$   
 $r_p = \#VALUE!$   
 $r_s = \#VALUE!$   
Slope = -0.0008  
Intercept = 0.0086  
 $h_c = \#VALUE!$  in  
 $t_c = \#VALUE!$  min  
 $C_{ae} = \#VALUE!$

Time-Deformation curve for 50 psf seating load  
Time (min)

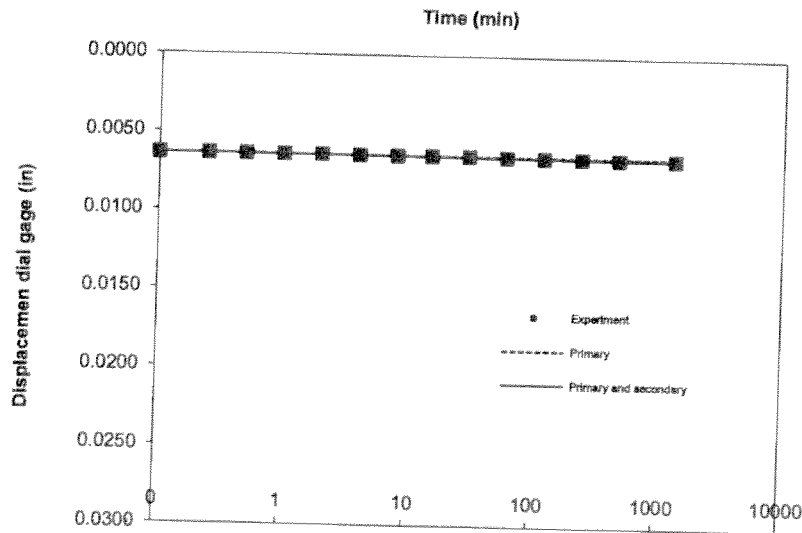




Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
100.0	0.00	0.00637	0.00638	0.00638
	0.10	0.00638	0.00639	0.00639
	0.25	0.00638	0.00639	0.00639
	0.50	0.00638	0.00639	0.00639
	1.00	0.00640	0.00640	0.00640
	2.00	0.00640	0.00641	0.00641
	4.00	0.00642	0.00642	0.00642
	8.00	0.00644	0.00643	0.00643
	15.00	0.00644	0.00643	0.00645
	30.00	0.00644	0.00644	0.00646
	60.00	0.00647	0.00644	0.00648
	120.00	0.00649	0.00644	0.00649
	240.00	0.00650	0.00644	0.00651
	480.00	0.00652	0.00644	0.00652
	1350.00	0.00654	0.00644	0.00654

$h_0 = 1.00483$  in  
 $U_s = 99\%$   
 $t_s = 21.71$  min  
 $d_s = 0.00644$  in  
 $d_0 = 0.00638$  in  
 $d_{100} = 0.00644$  in  
 $d = 0.50240$  in  
 $C_v = 0.0207$  in<sup>2</sup>/min  
 $r_i = 7.9\%$   
 $r_p = 32.4\%$   
 $r_s = 59.7\%$   
 Slope = 0.0000  
 Intercept = 0.0064  
 $h_c = 1.0048$  in  
 $t_c = 6.97$  min  
 $C_{ae} = 0.004\%$

Time-Deformation curve for 100 psf load

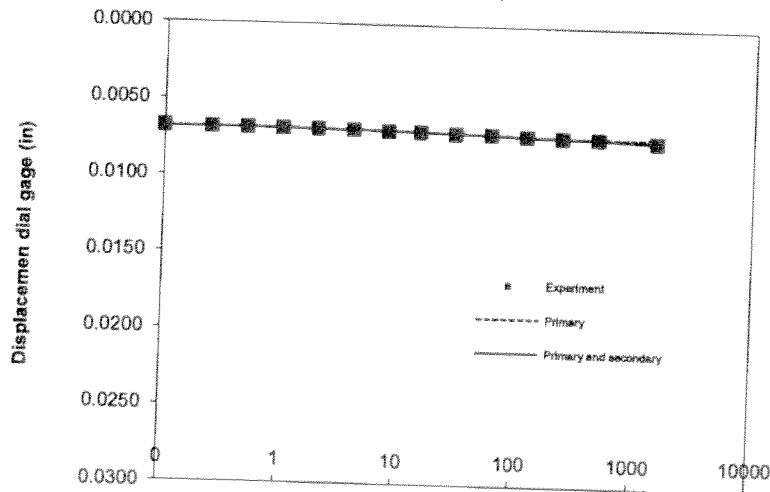




Applied stress psf	Elapsed time min	Dial in	Fitted Primary in	Fitted Primary and Secondary in
200.0	0.00	0.00673	0.00684	0.00684
	0.10	0.00680	0.00685	0.00685
	0.25	0.00682	0.00685	0.00685
	0.50	0.00684	0.00686	0.00686
	1.00	0.00687	0.00687	0.00687
	2.00	0.00689	0.00688	0.00688
	4.00	0.00690	0.00690	0.00690
	8.00	0.00695	0.00693	0.00693
	15.00	0.00699	0.00697	0.00697
	30.00	0.00706	0.00702	0.00702
	60.00	0.00706	0.00709	0.00709
	120.00	0.00715	0.00717	0.00717
	240.00	0.00720	0.00720	0.00720
	480.00	0.00723	0.00721	0.00726
	1500.00	0.00739	0.00721	0.00738

$h_0 = 1.00447$  in  
 $U_s = 99\%$   
 $t_s = 274.84$  min  
 $d_s = 0.00721$  in  
 $d_0 = 0.00684$  in  
 $d_{100} = 0.00721$  in  
 $d = 0.50209$  in  
 $C_v = 0.0016$  in<sup>2</sup>/min  
 $r_i = 15.7\%$   
 $r_p = 56.4\%$   
 $r_s = 27.9\%$   
 Slope = 0.0003  
 Intercept = 0.0066  
 $h_c = 1.0040$  in  
 $t_c = 302.92$  min  
 $C_{ae} = 0.025\%$

Time-Deformation curve for 200 psf load  
Time (min)



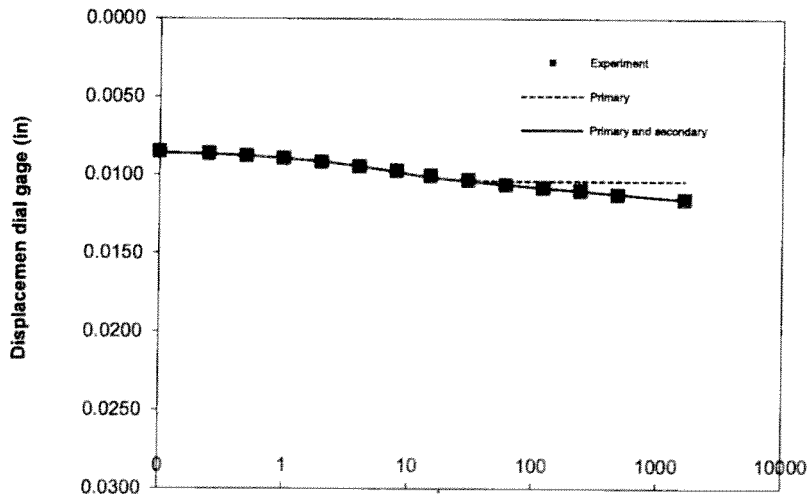
576



Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
500.0	0.00	0.00798	0.00844	0.00844
	0.10	0.00852	0.00860	0.00860
	0.25	0.00864	0.00869	0.00869
	0.50	0.00879	0.00880	0.00880
	1.00	0.00894	0.00895	0.00895
	2.00	0.00917	0.00916	0.00916
	4.00	0.00945	0.00945	0.00945
	8.00	0.00973	0.00983	0.00983
	15.00	0.01004	0.01017	0.01017
	30.00	0.01033	0.01036	0.01040
	60.00	0.01061	0.01039	0.01062
	120.00	0.01082	0.01039	0.01082
	240.00	0.01099	0.01039	0.01102
	480.00	0.01125	0.01039	0.01121
	1650.00	0.01155	0.01039	0.01157

$h_0 = 1.00322$  in  
 $U_s = 99\%$   
 $t_s = 33.76$  min  
 $d_s = 0.01037$  in  
 $d_0 = 0.00844$  in  
 $d_{100} = 0.01039$  in  
 $d = 0.50089$  in  
 $C_v = 0.0132$  in<sup>2</sup>/min  
 $r_i = 12.9\%$   
 $r_p = 54.6\%$   
 $r_s = 32.5\%$   
 Slope = 0.0007  
 Intercept = 0.0095  
 $h_c = 1.0008$  in  
 $t_c = 26.42$  min  
 $C_{se} = 0.065\%$

Time-Deformation curve for 500 psf load  
Time (min)



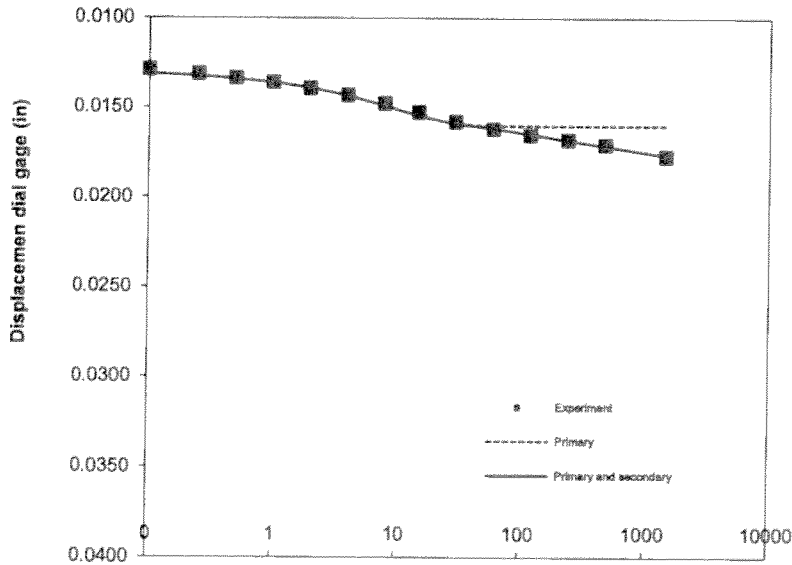
577



Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
1000.0	0.00	0.01216	0.01291	0.01291
	0.10	0.01291	0.01314	0.01314
	0.25	0.01315	0.01327	0.01327
	0.50	0.01338	0.01342	0.01342
	1.00	0.01362	0.01363	0.01363
	2.00	0.01395	0.01393	0.01393
	4.00	0.01435	0.01436	0.01436
	8.00	0.01481	0.01494	0.01494
	15.00	0.01531	0.01550	0.01550
	30.00	0.01582	0.01592	0.01592
	60.00	0.01623	0.01603	0.01618
	120.00	0.01656	0.01603	0.01651
	240.00	0.01681	0.01603	0.01684
	480.00	0.01709	0.01603	0.01716
	1476.00	0.01774	0.01603	0.01769

$h_0 = 0.99904$  in  
 $U_s = 99\%$   
 $t_s = 41.96$  min  
 $d_s = 0.01600$  in  
 $d_0 = 0.01291$  in  
 $d_{100} = 0.01603$  in  
 $d = 0.49837$  in  
 $C_v = 0.0105$  in<sup>2</sup>/min  
 $r_i = 13.3\%$   
 $r_p = 56.0\%$   
 $r_s = 30.7\%$   
 Slope = 0.0011  
 Intercept = 0.0142  
 $h_c = 0.9952$  in  
 $t_c = 43.60$  min  
 $C_{ae} = 0.109\%$

Time-Deformation curve for 1000 psf load  
Time (min)

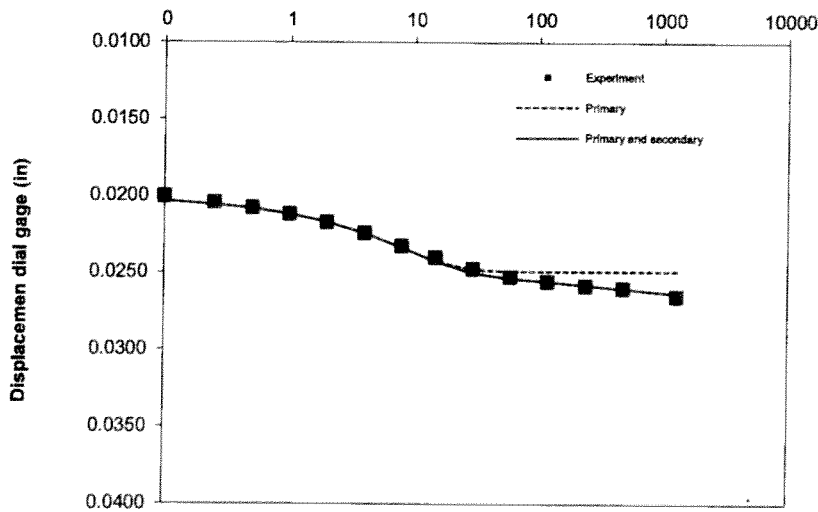




Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
2000.0	0.00	0.01886	0.01999	0.01999
	0.10	0.02006	0.02038	0.02038
	0.25	0.02045	0.02061	0.02061
	0.50	0.02079	0.02086	0.02086
	1.00	0.02121	0.02122	0.02122
	2.00	0.02175	0.02173	0.02173
	4.00	0.02244	0.02245	0.02245
	8.00	0.02326	0.02340	0.02340
	15.00	0.02401	0.02426	0.02426
	30.00	0.02474	0.02481	0.02503
	60.00	0.02525	0.02491	0.02536
	120.00	0.02556	0.02491	0.02559
	240.00	0.02586	0.02491	0.02581
	480.00	0.02601	0.02491	0.02604
	1290.00	0.02652	0.02491	0.02636

$h_0 = 0.99234$  in  
 $U_s = 99\%$   
 $t_s = 36.38$  min  
 $d_s = 0.02487$  in  
 $d_0 = 0.01999$  in  
 $d_{100} = 0.02491$  in  
 $d = 0.49437$  in  
 $C_v = 0.0120$  in<sup>2</sup>/min  
 $r_i = 14.8\%$   
 $r_p = 64.3\%$   
 $r_s = 21.0\%$   
 Slope = 0.0007  
 Intercept = 0.0240  
 $h_c = 0.9863$  in  
 $t_c = 15.19$  min  
 $C_{ae} = 0.076\%$

Time-Deformation curve for 2000 psf load  
Time (min)



579

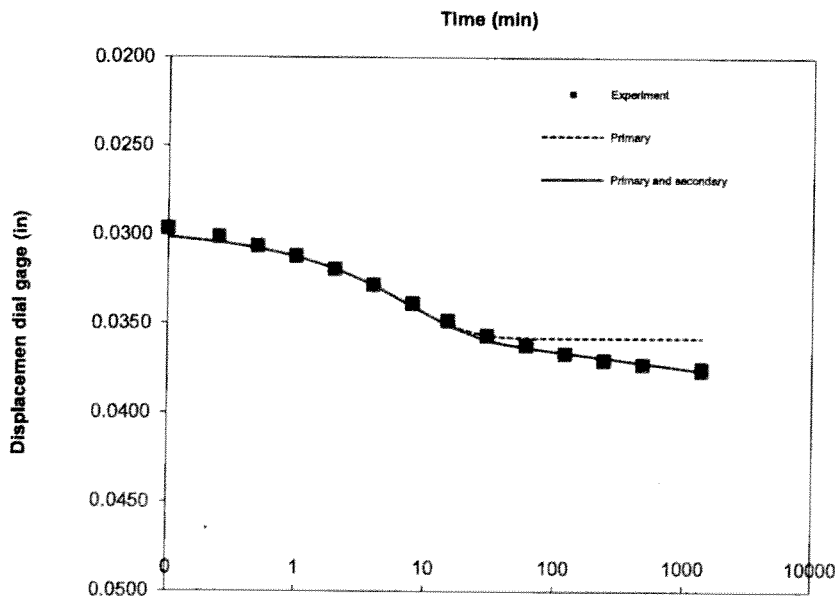




Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
4000.0	0.00	0.02650	0.02967	0.02967
	0.10	0.02967	0.03017	0.03017
	0.25	0.03015	0.03046	0.03046
	0.50	0.03066	0.03079	0.03079
	1.00	0.03124	0.03126	0.03126
	2.00	0.03195	0.03192	0.03192
	4.00	0.03283	0.03285	0.03285
	8.00	0.03388	0.03405	0.03405
	15.00	0.03483	0.03509	0.03509
	30.00	0.03566	0.03570	0.03597
	60.00	0.03621	0.03579	0.03635
	120.00	0.03668	0.03580	0.03664
	240.00	0.03706	0.03580	0.03692
	480.00	0.03729	0.03580	0.03721
	1380.00	0.03751	0.03580	0.03764

$h_0 = 0.98470$  in  
 $U_s = 99\%$   
 $t_s = 33.68$  min  
 $d_s = 0.03574$  in  
 $d_0 = 0.02967$  in  
 $d_{100} = 0.03580$  in  
 $d = 0.48923$  in  
 $C_v = 0.0127$  in<sup>2</sup>/min  
 $r_i = 28.7\%$   
 $r_p = 55.7\%$   
 $r_s = 15.6\%$   
 Slope = 0.0009  
 Intercept = 0.0347  
 $h_c = 0.9754$  in  
 $t_c = 15.61$  min  
 $C_{ae} = 0.097\%$

Time-Deformation curve for 4000 psf load

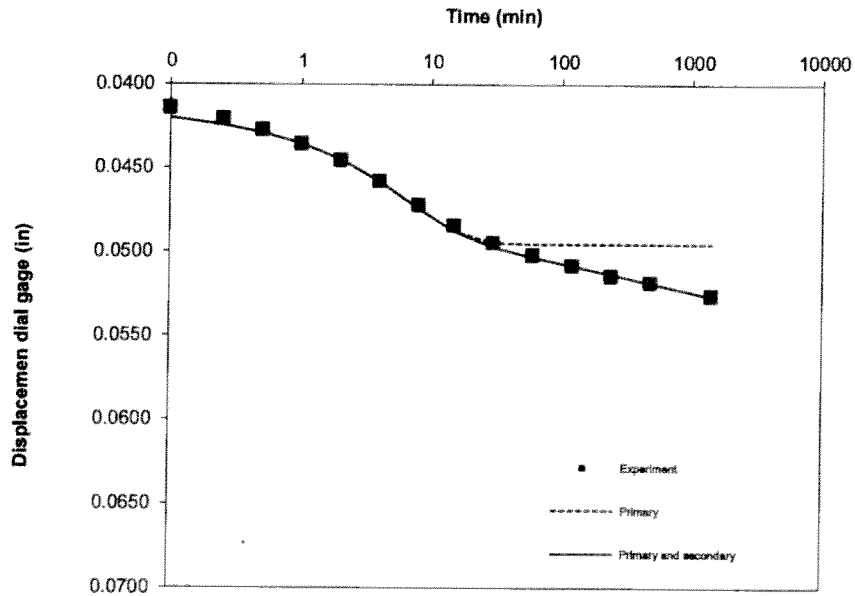




Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
8000.0	0.00	0.03922	0.04132	0.04132
	0.10	0.04142	0.04203	0.04203
	0.25	0.04206	0.04244	0.04244
	0.50	0.04272	0.04290	0.04290
	1.00	0.04354	0.04356	0.04356
	2.00	0.04453	0.04449	0.04449
	4.00	0.04578	0.04580	0.04580
	8.00	0.04719	0.04743	0.04743
	15.00	0.04841	0.04877	0.04877
	30.00	0.04944	0.04945	0.04972
	60.00	0.05019	0.04954	0.05032
	120.00	0.05080	0.04954	0.05083
	240.00	0.05142	0.04954	0.05135
	480.00	0.05182	0.04954	0.05186
1410.00	0.05260	0.04954	0.05266	

$h_0 = 0.97198$  in  
 $U_s = 99\%$   
 $t_s = 30.51$  min  
 $d_s = 0.04945$  in  
 $d_0 = 0.04132$  in  
 $d_{100} = 0.04954$  in  
 $d = 0.48289$  in  
 $C_v = 0.0136$  in<sup>2</sup>/min  
 $r_i = 15.7\%$   
 $r_p = 61.4\%$   
 $r_s = 22.9\%$   
 Slope = 0.0017  
 Intercept = 0.0473  
 $h_c = 0.9617$  in  
 $t_c = 20.79$  min  
 $C_{ae} = 0.177\%$

Time-Deformation curve for 8000 psf load

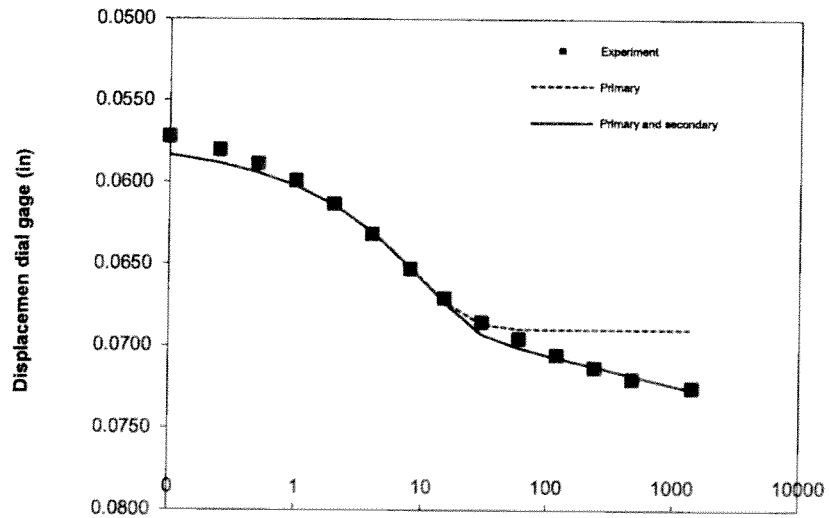




Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
16000.0	0.00	0.05454	0.05746	0.05746
	0.10	0.05722	0.05835	0.05835
	0.25	0.05803	0.05886	0.05886
	0.50	0.05887	0.05944	0.05944
	1.00	0.05991	0.06026	0.06026
	2.00	0.06134	0.06141	0.06141
	4.00	0.06317	0.06305	0.06305
	8.00	0.06531	0.06523	0.06523
	15.00	0.06710	0.06730	0.06735
	30.00	0.06855	0.06869	0.06930
	60.00	0.06957	0.06899	0.07015
	120.00	0.07057	0.06900	0.07071
	240.00	0.07133	0.06900	0.07126
	480.00	0.07201	0.06900	0.07181
	1416.00	0.07253	0.06900	0.07267

$h_0 = 0.95666$  in  
 $U_s = 99\%$   
 $t_s = 38.73$  min  
 $d_s = 0.06889$  in  
 $d_0 = 0.05746$  in  
 $d_{100} = 0.06900$  in  
 $d = 0.47398$  in  
 $C_v = 0.0103$  in<sup>2</sup>/min  
 $r_i = 16.3\%$   
 $r_p = 64.1\%$   
 $r_s = 19.6\%$   
 Slope = 0.0018  
 Intercept = 0.0669  
 $h_c = 0.9422$  in  
 $t_c = 14.00$  min  
 $C_{es} = 0.194\%$

Time-Deformation curve for 16000 psf load  
Time (min)

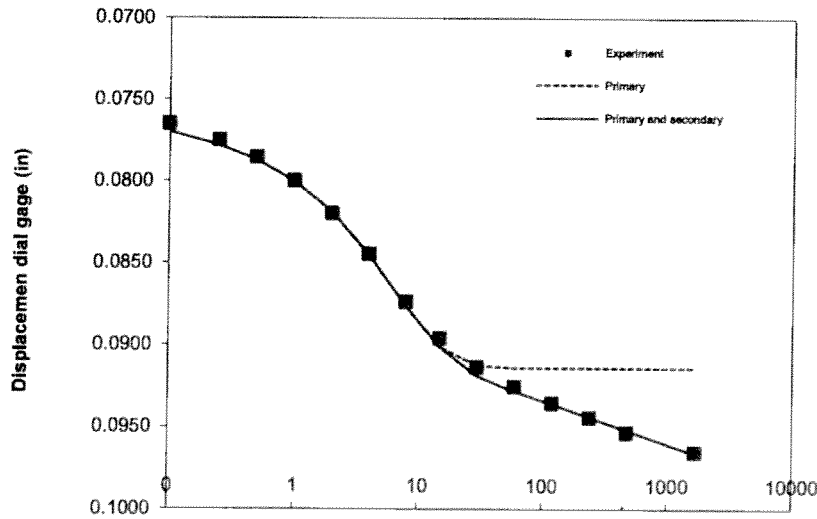




Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
32000.0	0.00	0.07417	0.07558	0.07558
	0.10	0.07650	0.07699	0.07699
	0.25	0.07749	0.07781	0.07781
	0.50	0.07853	0.07873	0.07873
	1.00	0.07998	0.08003	0.08003
	2.00	0.08197	0.08188	0.08188
	4.00	0.08445	0.08449	0.08449
	8.00	0.08736	0.08765	0.08765
	15.00	0.08960	0.09012	0.09012
	30.00	0.09138	0.09127	0.09191
	60.00	0.09254	0.09139	0.09282
	120.00	0.09354	0.09139	0.09361
	240.00	0.09441	0.09139	0.09440
	480.00	0.09533	0.09139	0.09519
	1680.00	0.09653	0.09139	0.09661

$h_0 = 0.93703$  in  
 $U_s = 99\%$   
 $t_s = 28.57$  min  
 $d_s = 0.09123$  in  
 $d_0 = 0.07558$  in  
 $d_{100} = 0.09139$  in  
 $d = 0.46386$  in  
 $C_v = 0.0134$  in<sup>2</sup>/min  
 $r_i = 6.3\%$   
 $r_p = 70.7\%$   
 $r_s = 23.0\%$   
 Slope = 0.0026  
 Intercept = 0.0882  
 $h_c = 0.9198$  in  
 $t_c = 16.99$  min  
 $C_{ae} = 0.284\%$

Time-Deformation curve for 32000 psf load  
Time (min)

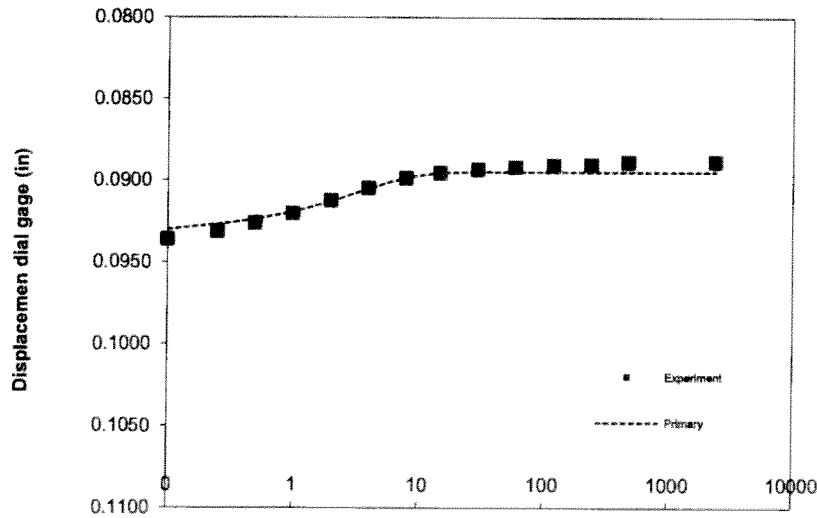




Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
8000.0	0.00	0.09554	0.09350	0.09350
	0.10	0.09362	0.09302	0.09302
	0.25	0.09315	0.09274	0.09274
	0.50	0.09263	0.09242	0.09242
	1.00	0.09203	0.09197	0.09197
	2.00	0.09124	0.09133	0.09133
	4.00	0.09047	0.09054	0.09054
	8.00	0.08986	0.08984	0.08984
	15.00	0.08955	0.08955	0.08961
	30.00	0.08935	0.08950	0.08969
	60.00	0.08920	0.08950	0.08981
	120.00	0.08908	0.08950	0.08992
	240.00	0.08903	0.08950	0.09004
	480.00	0.08887	0.08950	0.09016
	2400.00	0.08887	0.08950	0.09044

$h_0 = 0.91566$  in  
 $U_s = 99\%$   
 $t_s = 15.41$  min  
 $d_s = 0.08954$  in  
 $d_0 = 0.09350$  in  
 $d_{100} = 0.08950$  in  
 $d = 0.45985$  in  
 $C_v = 0.0244$  in<sup>2</sup>/min  
 $r_i = 30.5\%$   
 $r_p = 60.0\%$   
 $r_s = 9.5\%$   
Slope = -0.0004  
Intercept = 0.0899  
 $h_c = 0.9217$  in  
 $t_c = 10.50$  min  
 $C_{ae} = 0.043\%$

Time-Deformation curve for 8000 psf unload  
Time (min)

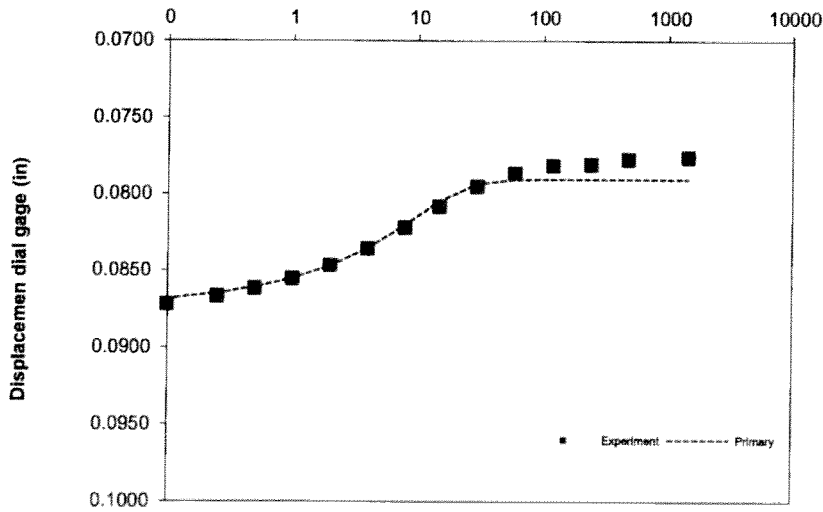




Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
2000.0	0.00	0.08892	0.08746	0.08746
	0.10	0.08720	0.08684	0.08708
	0.25	0.08668	0.08649	0.08684
	0.50	0.08619	0.08608	0.08652
	1.00	0.08553	0.08551	0.08604
	2.00	0.08468	0.08471	0.08532
	4.00	0.08358	0.08357	0.08427
	8.00	0.08221	0.08202	0.08281
	15.00	0.08083	0.08049	0.08135
	30.00	0.07953	0.07935	0.08030
	60.00	0.07866	0.07906	0.08009
	120.00	0.07813	0.07905	0.08017
	240.00	0.07807	0.07905	0.08025
	480.00	0.07775	0.07905	0.08034
	1440.00	0.07762	0.07905	0.08048

$h_0 = 0.92228$  in  
 $U_s = 99\%$   
 $t_s = 42.41$  min  
 $d_s = 0.07913$  in  
 $d_0 = 0.08746$  in  
 $d_{100} = 0.07905$  in  
 $d = 0.46397$  in  
 $C_v = 0.0090$  in<sup>2</sup>/min  
 $r_i = 12.9\%$   
 $r_p = 74.4\%$   
 $r_s = 12.7\%$   
 Slope = -0.0003  
 Intercept = 0.0785  
 $h_c = 0.9322$  in  
 $t_c = 0.01$  min  
 $C_{ae} = 0.031\%$

Time-Deformation curve for 2000 psf unload  
Time (min)



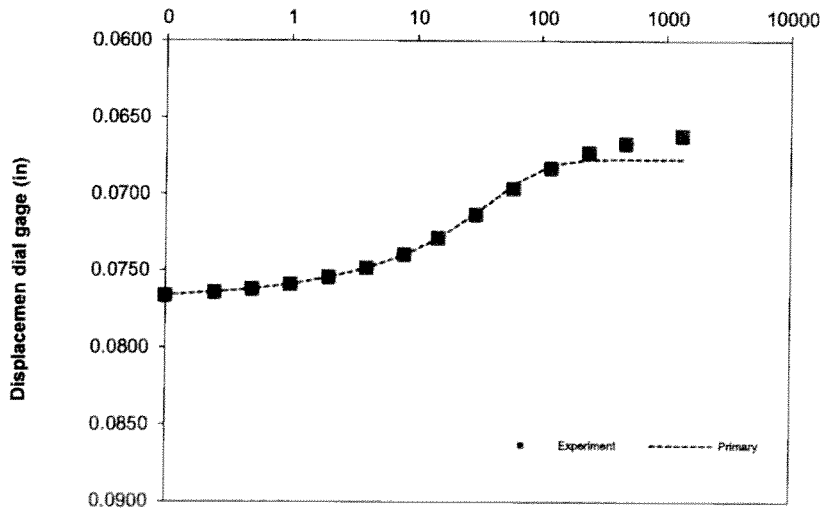
585



Applied stress	Elapsed time	Dial	Fitted Primary	Fitted Primary and Secondary
psf	min	in	in	in
500.0	0.00	0.07707	0.07693	0.07693
	0.10	0.07664	0.07660	0.07660
	0.25	0.07643	0.07641	0.07641
	0.50	0.07622	0.07619	0.07619
	1.00	0.07591	0.07589	0.07589
	2.00	0.07545	0.07545	0.07545
	4.00	0.07484	0.07484	0.07484
	8.00	0.07398	0.07398	0.07398
	15.00	0.07288	0.07289	0.07289
	30.00	0.07137	0.07126	0.07126
	60.00	0.06966	0.06939	0.06939
	120.00	0.06834	0.06809	0.06809
	240.00	0.06731	0.06774	0.06814
	480.00	0.06672	0.06772	0.06915
	1350.00	0.06622	0.06772	0.07068

$h_0 = 0.93413$  in  
 $U_s = 99\%$   
 $t_s = 176.44$  min  
 $d_s = 0.06781$  in  
 $d_0 = 0.07693$  in  
 $d_{100} = 0.06772$  in  
 $d = 0.46944$  in  
 $C_v = 0.0022$  in<sup>2</sup>/min  
 $r_i = 1.3\%$   
 $r_p = 84.9\%$   
 $r_s = 13.8\%$   
 Slope = -0.0034  
 Intercept = 0.0754  
 $h_c = 0.9435$  in  
 $t_c = 182.26$  min  
 $C_{ae} = 0.361\%$

Time-Deformation curve for 500 psf unload  
Time (min)

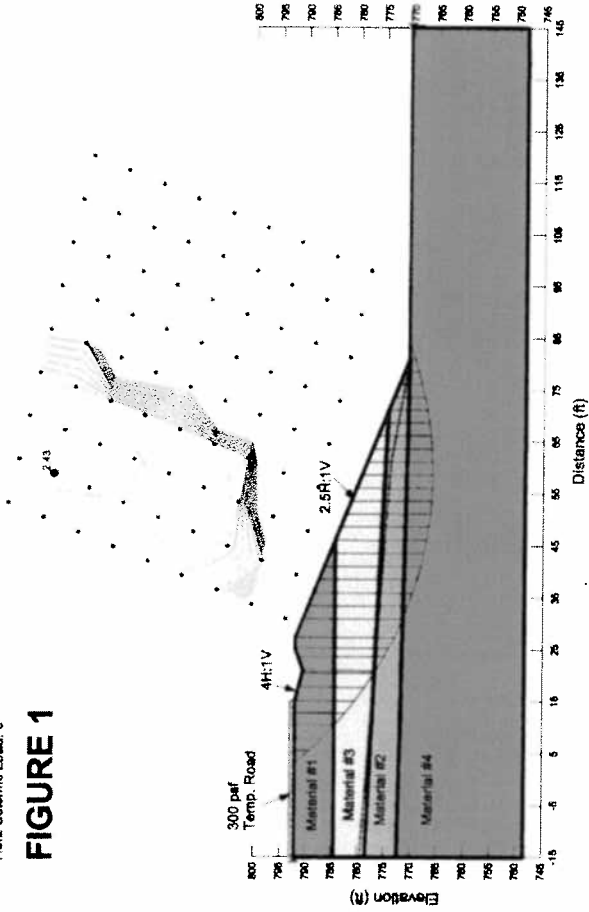


## **SLOPE STABILITY ANALYSIS**



Title: Washington Street  
 Comments: Station 118+50  
 Date: 2/28/2012  
 Directory: Q:\L\CDOT\1150\_004\Geotechnical\slope stability analysis\1  
 Name: Station 118+50 temporary case #2.gaz  
 Horiz Seismic Load: 0

**FIGURE 1**

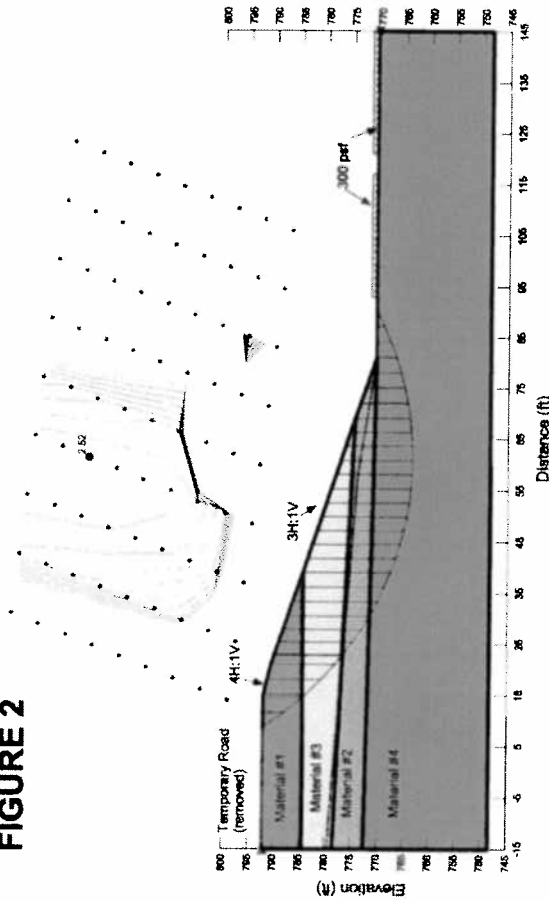


- Material #: 1  
 Description: Fill  
 Model: MohrCoulomb  
 Wt: 120  
 Cohesion: 250  
 Phi: 0  
 Piezometric Line: 0
- Material #: 2  
 Description: Native Silt  
 Model: MohrCoulomb  
 Wt: 110  
 Cohesion: 0  
 Phi: 31  
 Piezometric Line: 1
- Material #: 3  
 Description: Upper Native Clay  
 Model: MohrCoulomb  
 Wt: 135  
 Cohesion: 2000  
 Phi: 0  
 Piezometric Line: 0
- Material #: 4  
 Description: Lower Native Clay  
 Model: MohrCoulomb  
 Wt: 135  
 Cohesion: 125  
 Phi: 28  
 Piezometric Line: 1

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Title: Washington Street  
 Comments: Station 116+50  
 Date: 2/28/2012  
 Directory: C:\L\CDOT\1160\_004\Geotechnical\slope stability analysis\  
 Name: Station 116+50 permanent case #2.gsz  
 Horiz Seismic Load: 0

**FIGURE 2**



- |                     |                                |
|---------------------|--------------------------------|
| Material #: 1       | Description: Fill              |
| Model: MohrCoulomb  | Wt: 120                        |
| Cohesion: 250       | Phi: 0                         |
| Piezometric Line: 0 |                                |
| Material #: 2       | Description: Native Silt       |
| Model: MohrCoulomb  | Wt: 110                        |
| Cohesion: 0         | Phi: 31                        |
| Piezometric Line: 1 |                                |
| Material #: 3       | Description: Upper Native Clay |
| Model: MohrCoulomb  | Wt: 135                        |
| Cohesion: 2000      | Phi: 0                         |
| Piezometric Line: 0 |                                |
| Material #: 4       | Description: Lower Native Clay |
| Model: MohrCoulomb  | Wt: 135                        |
| Cohesion: 125       | Phi: 28                        |
| Piezometric Line: 1 |                                |

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## **HIGH LOAD MULTI-ROTATIONAL BEARINGS**

Effective: October 13, 1988

Revised: October 30, 2012

Description. This work shall consist of furnishing and installing High Load Multi-Rotational type bearing assemblies at the locations shown on the plans.

High Load Multi-Rotational (HLMR) bearings shall be one of the following at the Contractors option unless otherwise noted on the plans:

- a) Pot Bearings. These bearings shall be manufactured so that the rotational capability is provided by an assembly having a rubber disc of proper thickness, confined in a manner so it behaves like a fluid. The disc shall be installed, with a snug fit, into a steel cylinder and confined by a tight fitting piston. The outside diameter of the piston shall be no more than 0.03 in. (750 microns) less than the inside diameter of the cylinder at the interface level of the piston and rubber disc. The sides of the piston shall be beveled. PTFE sheets, or silicone grease shall be utilized to facilitate rotation of the rubber disc. Suitable brass sealing rings shall be provided to prevent any extrusion between piston and cylinder.
- b) Shear Inhibited Disc Type Bearing. The Structural Element shall be restricted from shear by the pin and ring design and need not be completely confined as with the Pot Bearing design. The disc shall be a molded monolithic Polyether Urethane compound.

These bearings shall be further subdivided into one or more of the following types:

- 1) Fixed. These allow rotation in any direction but are fixed against translation.
- 2) Guided Expansion. These allow rotation in any direction but translation only in limited directions.
- 3) Non-Guided Expansion. These allow rotation and translation in any direction.

The HLMR bearings shall be of the type specified and designed for the loads shown on the plans. The design of the top and bottom bearing plates are based on detail assumptions which are not applicable to all suppliers and may require modifications depending on the supplier chosen by the Contractor. The overall depth dimension for the HLMR bearings shall be as specified on the plans. The horizontal dimensions shall be limited to the available bearing seat area. Any modifications required to accommodate the bearings chosen shall be submitted to the Engineer for approval prior to ordering materials. Modifications required shall be made at no additional cost to the State. Inverted pot bearing configurations will not be permitted.

The Contractor shall comply with all manufacturer's material, fabrication and installation requirements specified.

All bearings shall be supplied by prequalified manufacturers. The Department will maintain a list of prequalified manufacturers.

Submittals. Shop drawings shall be submitted to the Engineer for approval according to Article 105.04 of the Standard Specifications. In addition 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 stating the bearing assemblies furnished conform to all the requirements shown on the plans and as herein specified. Submittals with insufficient test data and supporting certifications will be rejected.

Materials. The materials for the HLMR bearing assemblies shall be according to the following:

- (a) Elastomeric Materials. The rubber disc for Pot bearings shall be according to Article 1083.02(a) of the Standard Specifications.
- (b) Polytetrafluoroethylene (PTFE) Material. The PTFE material shall be according to Article 1083.02(b) of the Standard Specifications.
- (c) Stainless Steel Sheets: The stainless steel sheets shall be of the thickness specified and shall be according to ASTM A 240 (A 240M), Type 302 or 304. The sliding surface shall be polished to a bright mirror finish less than 20 micro-in. (510 nm ) root mean square.
- (d) Structural Steel. All structural steel used in the bearing assemblies shall be according to AASHTO M 270, Grade 50 (M 270M Grade 345), unless otherwise specified.
- (e) Threaded studs. The threaded stud, when required, shall conform to the requirements of Article 1083.02(d)(4) of the Standard Specifications.

- (f) Polyether Urethane for Disc bearings shall be according to all of the following requirements:

PHYSICAL PROPERTY	ASTM TEST METHOD	REQUIREMENTS	
Hardness, Type D durometer	D 2240	45 Min	65 Max
Tensile Stress, psi (kPa) At 100% elongation, min	D 412	1500 psi (10,350 kPa)	2300 psi (15,900 kPa)
Tensile Stress, psi (kPa) At 200% elongation, min	D 412	2800 psi (19,300 kPa)	4000 psi (27,600 kPa)
Tensile Strength, psi (kPa), min	D 412	4000 psi (27,600 kPa)	6000 psi (41,400 kPa)
Ultimate Elongation, %, min	D 412	350	220
Compression Set 22 hr. at 158 °F (70 °C), Method B %, max	D 395	40	40

The physical properties for a durometer hardness between the minimum and maximum values shown above shall be determined by straight line interpolation.

Design. The fabricator shall design the HLMR bearings according to the appropriate AASHTO Design Specifications noted on the bridge plans.

Fabrication. The bearings shall be complete factory-produced assemblies. They shall provide for rotation in all directions and for sliding, when specified, in directions as indicated on the plans. All bearings shall be furnished as a complete unit from one manufacturing source. All material used in the manufacture shall be new and unused with no reclaimed material incorporated into the finished assembly.

The translation capability for both guided and non-guided expansion bearings shall be provided by means of a polished stainless steel sliding plate that bears on a PTFE sheet bonded and recessed to the top surface of the piston or disc. The sliding element of expansion bearings shall be restrained against movement in the fixed direction by exterior guide bars capable of resisting the horizontal forces or 20 percent of the vertical design load on the bearing applied in any direction, whichever is greater. The sliding surfaces of the guide bar shall be of PTFE sheet and stainless steel. Guiding off of the fixed base, or any extension of the base, will not be permitted.

Structural steel bearing plates shall be fabricated according to Article 505.04(I) of the Standard Specifications. Prior to shipment the exposed edges and other exposed portions of the structural steel bearing plates shall be cleaned and painted according to Articles 506.03 and 506.04 of the Standard Specifications. Painting shall be with the paint specified for shop painting of structural steel. During cleaning and painting the stainless steel, PTFE sheet and neoprene shall be protected from abrasion and paint.

PTFE sheets shall be bonded to steel under factory controlled conditions using heat and pressure for the time required to set the epoxy adhesive used. The PTFE sheet shall be free from bubbles and the sliding surface shall be burnished to an absolutely smooth surface.

The steel piston and the steel cylinder for pot bearings shall each be machined from a solid piece of steel. The steel base cylinder shall be either integrally machined, recessed into with a snug fit, or continuously welded to its bottom steel bearing plate.

Packaging. Each HLMR bearing assembly shall be fully assembled at the manufacturing plant and delivered to the construction site as complete units. The assemblies shall be packaged, crated or wrapped so the assemblies will not be damaged during handling, transporting and shipping. The bearings shall be held together with removable restraints so sliding surfaces are not damaged.

Centerlines shall be marked on both top and base plates for alignment in the field. The bearings shall be shipped in moisture-proof and dust-proof covers.

Performance Testing. The following performance tests are required. All tests shall be performed by the manufacturer prior to shipment. Where lot testing is permitted, a lot size shall be the number of bearings per type on the project but not to exceed 25 bearings per type.

Dimension Check. Each bearing shall be checked dimensionally to verify all bearing components are within tolerances. Failure to satisfy any dimensional tolerance shall be grounds for rejecting the bearing component or the entire bearing assembly.

Clearance Test. This test shall be performed on one bearing per lot. The bearing selected for this test shall be the one with the least amount of clearance based on the dimension check. The bearing assembly shall be loaded to its service limit state rated capacity at its full design rotation but not less than 0.02 radians to verify the required clearances exist. This test shall be performed twice for each bearing with the rotation oriented longitudinally with the bridge once in each direction. Any visual signs of rubbing or binding shall be grounds for rejection of the lot.

Proof Load Test. This test shall be performed on one bearing per lot. The bearing assembly shall be load tested to 150 percent of the service limit state rated capacity at a rotation of 0.02 radians. The load shall be maintained for 5 minutes, removed then reapplied for 5 minutes. If the load drops below the required value during either application, the test shall be restarted from the beginning. This test shall be performed twice for each bearing with the rotation oriented longitudinally with the bridge once in each direction.

The bearing shall be visually examined both during the test and upon disassembly after the test. Any resultant visual defects include, but are not limited to:

1. Extruded or deformed elastomer, polyether urethane, or PTFE.
2. Insufficient clearances such as evidence of metal to metal contact between the pot wall and the top plate.
3. Damaged components such as cracked steel, damaged seal rings, or damaged limiting rings.
4. Bond failure.

If any of the above items are found it shall be grounds for rejection of the lot.

Sliding Friction Test. For expansion bearings, this test shall be performed on one bearing per lot. The sliding surfaces shall be thoroughly cleaned with a degreasing solvent. No lubrication other than that specified for the bearing shall be used. The bearing shall be loaded to its service limit state rated capacity for 1 hour prior to and throughout the duration of the sliding test. At least 12 cycles of plus and minus sliding with an amplitude equaling the smaller of the design displacement and 1 inch (25 mm) shall then be applied. The average sliding speed shall be between 0.1 inch and 1.0 inches (2.5 mm and 25 mm) per minute. The sliding friction coefficient shall be computed for each direction of each cycle and its mean and standard deviation shall be computed for the sixth through twelfth cycles.

The friction coefficient for the first movement and the mean plus two standard deviations for the sixth through twelfth cycles shall not exceed the design value used. In addition, the mean value for the sixth through twelfth cycles shall not exceed  $\frac{2}{3}$  of the design value used. Failure of either of these shall result in rejection of the lot.

The bearing shall also be visually examined both during and after the testing, any resultant defects, such as bond failure, physical destruction, or cold flow of the PTFE shall also be cause for rejection of the lot.

The Contractor shall furnish to the Department a notarized certification from the bearing manufacturer stating the HLMR bearings have been performance tested as specified. The Contractor shall also furnish to the Engineer of Tests at the Bureau of Materials and Physical Research (126 East Ash Springfield, IL 62704) a purchase order prior to fabrication. The purchase order shall contain, as a minimum, the quantity and size of each type of bearing furnished. The Department reserves the right to perform any of the specified tests on one or more of the furnished bearings. If the tested bearing shows failure it shall be replaced and the remaining bearings shall be similarly tested for acceptance at the Contractor's expense.

When directed by the Engineer, the manufacturer shall furnish an additional bearing assembly and/or random samples of component materials used in the bearings, for testing by the Department, according to Article 1083.04 of the Standard Specifications.

Installation. The HLMR bearings shall be erected according to Article 521.05 of the Standard Specifications.

Exposed edges and other exposed portions of the structural steel plates shall be field painted as specified for Structural Steel.

Basis of Payment. This work will be paid for at the contract unit price each for HIGH LOAD MULTI-ROTATIONAL BEARINGS, FIXED; HIGH LOAD MULTI-ROTATIONAL BEARINGS, GUIDED EXPANSION; or HIGH LOAD MULTI-ROTATIONAL BEARINGS, NON-GUIDED EXPANSION of the load rating specified.

When the fabrication and erection of HLMR bearings is accomplished under separate contracts, the applicable requirements of Article 505.09 shall apply.

Fabricated HLMR bearings and other materials complying with the requirements of this item, furnished and accepted, will be paid for at the contract unit price each for FURNISHING HIGH LOAD MULTI-ROTATIONAL BEARINGS, FIXED, FURNISHING HIGH LOAD MULTI-ROTATIONAL BEARINGS, GUIDED EXPANSION or FURNISHING HIGH LOAD MULTI-ROTATIONAL BEARINGS, NON-GUIDED EXPANSION of the load rating specified.

Storage and care of fabricated HLMR bearings and other materials complying with the requirements of this item by the Fabrication Contractor beyond the specified storage period, will be paid for at the contract unit price per calendar day for STORAGE OF HIGH LOAD MULTI-ROTATIONAL BEARINGS if a pay item is provided for in the contract, or will be paid for according to Article 109.04 if a pay item is not provided in the contract.

HLMR bearings and other materials fabricated under this item erected according to the requirements of the specifications, and accepted, will be paid for at the contract unit price each for ERECTING HIGH LOAD MULTI-ROTATIONAL BEARINGS, FIXED, ERECTING HIGH LOAD MULTI-ROTATIONAL BEARINGS, GUIDED EXPANSION or ERECTING HIGH LOAD MULTI-ROTATIONAL BEARINGS, NON-GUIDED EXPANSION of the load rating specified.



## **TEMPORARY SOIL RETENTION SYSTEM**

Effective: December 30, 2002

Revised : May 11, 2009

Description. This work shall consist of designing, furnishing, installing, adjusting for stage construction when required and subsequent removal of the temporary soil retention system according to the dimensions and details shown on the plans and in the approved design submittal.

General. The temporary soil retention system shall be designed by the Contractor as a minimum, to retain the exposed surface area specified in the plans or as directed by the Engineer.

The design calculations and details for the temporary soil retention system proposed by the Contractor shall be submitted to the Engineer for approval. The calculations shall be prepared and sealed by an Illinois Licensed Structural Engineer. This approval will not relieve the Contractor of responsibility for the safety of the excavation. Approval shall be contingent upon acceptance by all involved utilities and/or railroads.

Construction. The Contractor shall verify locations of all underground utilities before installing any of the soil retention system components or commencing any excavation. Any disturbance or damage to existing structures, utilities or other property, caused by the Contractor's operation, shall be repaired by the Contractor in a manner satisfactory to the Engineer at no additional cost to the Department. The soil retention system shall be installed according to the Contractor's approved design, or as directed by the Engineer, prior to commencing any related excavation. If unable to install the temporary soil retention system as specified in the approved design, the Contractor shall have the adequacy of the design re-evaluated. Any reevaluation shall be submitted to the Engineer for approval prior to commencing the excavation adjacent to the area in question. The Contractor shall not excavate below the maximum excavation line shown in the approved design without the prior permission of the Engineer. The temporary soil retention system shall remain in place until the Engineer determines it is no longer required.

The temporary soil retention system shall be removed and disposed of by the Contractor when directed by the Engineer. When allowed, the Contractor may elect to cut off a portion of the temporary soil retention system leaving the remainder in place. The remaining temporary soil retention system shall be removed to a depth which will not interfere with the new construction, and as a minimum, to a depth of 12 in. (300 mm) below the finished grade, or as directed by the Engineer. Removed system components shall become the property of the Contractor.

When an obstruction is encountered, the Contractor shall notify the Engineer and upon concurrence of the Engineer, the Contractor shall begin working to break up, push aside, or remove the obstruction. An obstruction shall be defined as any object (such as but not limited to, boulders, logs, old foundations etc.) where its presence was not obvious or specifically noted on the plans prior to bidding, that cannot be driven or installed through or around, with normal driving or installation procedures, but requires additional excavation or other procedures to remove or miss the obstruction.

Method of Measurement. The temporary soil retention system furnished and installed according to the Contractor's approved design or as directed by the Engineer will be measured for payment in place, in square feet (square meters). The area measured shall be the vertical exposed surface area envelope of the excavation supported by temporary soil retention system. Portions of the temporary soil retention system left in place for reuse in later stages of construction shall only be measured for payment once.

Any temporary soil retention system installed beyond those dimensions shown on the contract plans or the approved contractor's design without the written permission of the Engineer, shall not be measured for payment but shall be done at the contractor's own expense.

Basis of Payment. This work will be paid for at the contract unit price per square foot (square meter) for TEMPORARY SOIL RETENTION SYSTEM.

Payment for any excavation, related solely to the installation and removal of the temporary soil retention system and/or its components, shall not be paid for separately but shall be included in the unit bid price for TEMPORARY SOIL RETENTION SYSTEM. Other excavation, performed in conjunction with this work, will not be included in this item but shall be paid for as specified elsewhere in this contract.

Obstruction mitigation shall be paid for according to Article 109.04 of the Standard Specifications.

## **PIPE UNDERDRAINS FOR STRUCTURES**

Effective: May 17, 2000

Revised: January 22, 2010

Description. This work shall consist of furnishing and installing a pipe underdrain system as shown on the plans, as specified herein, and as directed by the Engineer.

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

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

The drainage aggregate shall be a combination of one or more of the following gradations, FA1, FA2, CA5, CA7, CA8, CA11, or CA13 thru 16, according to Sections 1003 and 1004 of the Standard Specifications.

The fabric surrounding the drainage aggregate shall be Geotechnical Fabric for French Drains according to Article 1080.05 of the Standard Specifications.

Construction Requirements. All work shall be according to the applicable requirements of Section 601 of the Standard Specifications except as modified below.

The pipe underdrains shall consist of a perforated pipe drain situated at the bottom of an area of drainage aggregate wrapped completely in geotechnical fabric and shall be installed to the lines and gradients as shown on the plans.

Method of Measurement. Pipe Underdrains for Structures shall be measured for payment in feet (meters), 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. Concrete headwalls shall be included in the cost of Pipe Underdrains for Structures, but shall not be included in the measurement for payment.

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for PIPE UNDERDRAINS FOR STRUCTURES of the diameter specified. Furnishing and installation of the drainage aggregate, geotechnical fabric, 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.

## **BRACED EXCAVATION**

Effective: August 9, 1995

Revised: May 18, 2011

Description. This work shall include the installation of a bracing system, excavation, and backfilling to the elevation of the existing grade according to Section 502 and the following. The bracing system shall be designed and installed to prevent the movement of soil, structures, pavements and/or utilities adjacent to the excavated area.

Construction Requirements. The bracing system shall support excavations by the use of sheeting, timber or plates. The Contractor shall submit design calculations and shop drawings prepared and sealed by an Illinois Licensed Structural Engineer for the bracing system. Shop drawings shall show all necessary details for the construction of the bracing system. The design calculations and shop drawings shall be submitted to the Engineer for review and approval.

This work shall not proceed without the approval and authorization of the Engineer. 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 judgment 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. Bracing members shall be completely removed after the excavation is backfilled.

Method of Measurement. This work shall be measured in cubic yards (cubic meters) according to the requirements for structure excavation as specified in Section 502.12 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per cubic yard (cubic meter) for BRACED EXCAVATION. Payment for BRACED EXCAVATION 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. No separate payment will be made for structure excavation where BRACED EXCAVATION is shown.

**GRANULAR BACKFILL FOR STRUCTURES**

Effective: April 19, 2012

Revised: October 30, 2012

Revise Section 586 of the Standard Specifications to read:

**SECTION 586. GRANULAR BACKFILL FOR STRUCTURES**

**586.01 Description.** This work shall consist of furnishing, transporting and placing granular backfill for abutment structures.

**586.02 Materials.** Materials shall be according to the following.

Item	Article/Section
(a) Fine Aggregate.....	1003.04
(b) Coarse Aggregates.....	1004.05

**CONSTRUCTION REQUIREMENTS**

**586.03 General.** This work shall be done according to Article 502.10 except as modified below. The backfill volume shall be backfilled, with granular material as specified in Article 586.02, to the required elevation as shown in the contract plans. The backfill volume shall be placed in convenient lifts for the full width to be backfilled. Unless otherwise specified in the contract plans, mechanical compaction will not be required. A deposit of gravel or crushed stone placed behind drain holes shall not be required. All drains not covered by geocomposite wall drains or other devices to prevent loss of backfill material shall be covered by sufficient filter fabric material meeting the requirements of Section 1080 and Section 282 with either 6 or 8 oz/sq yd (200 or 270 g/sq m) material allowed, with free edges overlapping the drain hole by at least 12 in. (300 mm) in all directions.

The granular backfill shall be brought to the finished grade as shown in the contract plans. When concrete is to be cast on top of the granular backfill, the Contractor, subject to approval of the Engineer, may prepare the top surface of the fill to receive the concrete as he/she deems necessary for satisfactory placement at no additional cost to the Department.

**586.04 Method of Measurement.** This work will be measured for payment as follows.

- (a) Contract Quantities. The requirements for the use of contract quantities shall conform to Article 202.07(a).
- (b) Measured Quantities. This work will be measured for payment in place and the volume computed in cubic yards (cubic meters). The volume will be determined by the method of average end areas behind the abutment.

**586.05 Basis of Payment.** This work will be paid for at the contract unit price per cubic yard (cubic meter) for GRANULAR BACKFILL FOR STRUCTURES.

State of Illinois  
Department of Transportation  
Bureau of Local Roads and Streets

SPECIAL PROVISION  
FOR  
COOPERATION WITH UTILITIES

Effective: January 1, 1999  
Revised: January 1, 2007

All references to Sections or Articles in this specification shall be construed to mean specific Section or Article of the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation.

Replace Article 105.07 of the Standard Specifications with the following:

**“105.07 Cooperation with Utilities.** The adjustment of utilities consists of the relocation, removal, replacement, rearrangements, reconstruction, improvement, disconnection, connection, shifting, new installation or altering of an existing utility facility in any manner.

When the plans or special provisions include information pertaining to the location of underground utility facilities, such information represents only the opinion of the Department as to the location of such utilities and is only included for the convenience of the bidder. The Department assumes no responsibility in respect to the sufficiency or the accuracy of the information shown on the plans relative to the location of the underground utility facilities.

Utilities which are to be adjusted shall be adjusted by the utility owner or the owner's representative or by the Contractor as a contract item. Generally, arrangements for adjusting existing utilities will be made by the Department prior to project construction; however, utilities will not necessarily be adjusted in advance of project construction and, in some cases, utilities will not be removed from the proposed construction limits. When utility adjustments must be performed in conjunction with construction, the utility adjustment work will be shown on the plans and/or covered by Special Provisions.

When the Contractor discovers a utility has not been adjusted by the owner or the owner's representative as indicated in the contract documents, or the utility is not shown on the plans or described in the Special Provisions as to be adjusted in conjunction with construction, the Contractor shall not interfere with said utility, and shall take proper precautions to prevent damage or interruption of the utility and shall promptly notify the Engineer of the nature and location of said utility.

All necessary adjustments, as determined by the Engineer, of utilities not shown on the plans or not identified by markers, will be made at no cost to the Contractor except traffic structures, light poles, etc., that are normally located within the proposed construction limits as hereinafter defined will not be adjusted unless required by the proposed improvement.

(a) Limits of Proposed Construction for Utilities Paralleling the Roadway. For the purpose of this Article, limits of proposed construction for utilities extending in the same longitudinal direction as the roadway, shall be defined as follows:

(1) The horizontal limits shall be a vertical plane, outside of, parallel to, and 600 mm (2 ft) distant at right angles from the plan or revised slope limits.

In cases where the limits of excavation for structures are not shown on the plans, the horizontal limits shall be a vertical plane 1.2 m (4 ft) outside the edges of structure footings or the structure where no footings are required.

(2) The upper vertical limits shall be the regulations governing the roadbed clearance for the specific utility involved.

(3) The lower vertical limits shall be the top of the utility at the depth below the proposed grade as prescribed by the governing agency or the limits of excavation, whichever is less.

(b) Limits of Proposed Construction for Utilities Crossing the Roadway. For the purpose of this Article, limits of proposed construction for utilities crossing the roadway in a generally transverse direction shall be defined as follows:

(1) Utilities crossing excavations for structures that are normally made by trenching such as sewers, underdrains, etc. and all minor structures such as manholes, inlets, foundations for signs, foundations for traffic signals, etc., the limits shall be the space to be occupied by the proposed permanent construction unless otherwise required by the regulations governing the specific utility involved.

(2) For utilities crossing the proposed site of major structures such as bridges, sign trusses, etc., the limits shall be as defined above for utilities extending in the same general direction as the roadway.

The Contractor may make arrangements for adjustment of utilities outside of the limits of proposed construction provided the Contractor furnishes the Department with a signed agreement with the utility owner covering the adjustments to be made. The cost of any adjustments made outside the limits of proposed construction shall be the responsibility of the Contractor unless otherwise provided.

The Contractor shall request all utility owners to field locate their facilities according to Article 107.31. The Engineer may make the request for location from the utility after receipt of notice from the Contractor. On request, the Engineer will make an inspection to verify that the utility company has field located its facilities, but will not assume responsibility for the accuracy of such work. The Contractor shall be responsible for maintaining the excavations or markers provided by the utility owners. This field location procedure may be waived if the utility owner has stated in writing to the Department it is satisfied the construction plans are sufficiently accurate. If the utility owner does not submit such statement to the Department, and they do not field locate their facilities in both horizontal and vertical alignment, the Engineer will authorize the Contractor in writing to proceed to locate the facilities in the most economical and reasonable manner, subject to the approval of the Engineer, and be paid according to Article 109.04.



The Contractor shall coordinate with any planned utility adjustment or new installation and the Contractor shall take all precautions to prevent disturbance or damage to utility facilities. Any failure on the part of the utility owner, or their representative, to proceed with any planned utility adjustment or new installation shall be reported promptly by the Contractor to the Engineer orally and in writing.

The Contractor shall take all necessary precautions for the protection of the utility facilities. The Contractor shall be responsible for any damage or destruction of utility facilities resulting from neglect, misconduct, or omission in the Contractor's manner or method of execution or nonexecution of the work, or caused by defective work or the use of unsatisfactory materials. Whenever any damage or destruction of a utility facility occurs as a result of work performed by the Contractor, the utility company will be immediately notified. The utility company will make arrangements to restore such facility to a condition equal to that existing before any such damage or destruction was done.

It is understood and agreed that the Contractor has considered in the bid all of the permanent and temporary utilities in their present and/or adjusted positions.

No additional compensation will be allowed for any delays, inconvenience, or damage sustained by the Contractor due to any interference from the said utility facilities or the operation of relocating the said utility facilities.

State of Illinois Department of  
Transportation Bureau of Local  
Roads and Streets

SPECIAL PROVISION  
FOR  
INSURANCE

Effective: February 1, 2007  
Revised: August 1, 2007

All references to Sections or Articles in this specification shall be construed to mean specific Section or Article of the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation.

The Contractor shall name the following entities as additional insured under the Contractor's general liability insurance policy in accordance with Article 107.27:

Lake County Division of Transportation

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Lake County Public Works

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Village of Grayslake

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

State of Illinois  
DEPARTMENT OF TRANSPORTATION  
Bureau of Local Roads & Streets

SPECIAL PROVISION  
FOR  
FILLING HMA CORE HOLES WITH NON-SHRINK GROUT

Effective: January 1, 2008

All references to Sections and Articles in this Special Provision shall be construed to mean specific Sections and Articles in the Standard Specifications for Road and Bridge Construction adopted by the Department of Transportation.

Add the following after the first paragraph of Article 406.07(c) of the Standard Specifications:

“Upon completion of coring for density testing, all free water shall be removed from the core holes prior to filling. All core holes shall be filled with a non-shrink grout from the Department’s approved list, which shall be mixed in a separate container prior to placement in the hole. Only enough water to permit placement and consolidation by rodding shall be used, and the material shall be struck-off flush with the adjacent pavement.”

## COATED GALVANIZED STEEL CONDUIT (BDE)

Effective: January 1, 2013

Revised: August 1, 2014

Revise Article 811.03(b) of the Standard Specifications to read:

“(b) Coated Galvanized Steel Conduit. In addition to the methods described in Article 810.05(a) the following methods shall be observed when installing coated conduit.

Coated conduit pipe vise jaw adapters shall be used when the conduit is being clamped to avoid damaging the coating.

Coated conduit shall be cut with a roller cutter or by other means 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.”

Revise Article 1088.01(a)(3) of the Standard Specifications to read:

“(3) Coated Galvanized Steel Conduit. The conduit prior to coating shall meet the requirements for rigid metal conduit and be manufactured according to NEMA Standard No. RN1.

The coating shall have the following characteristics.

Hardness	85+ Shore A Durometer
Dielectric Strength	400 V/mil @ 60 Hz
Aging	1,000 Hours Atlas Weatherometer
Brittleness Temperature	0 °F (-18 °C) when tested according to ASTM D 746
Elongation	200 percent

The exterior galvanized surfaces shall be coated with a primer before the coating to ensure a bond between the zinc substrate and the coating. The bond strength created shall be greater than the tensile strength of the plastic coating. The nominal thickness of the coating shall be 40 mils (1 mm). The coating shall pass the following bonding test.

Two parallel cuts 1/2 in. (13 mm) apart and 1 1/2 in. (38 mm) in length shall be made with a sharp knife along the longitudinal axis. A third cut shall be made perpendicular to and crossing the longitudinal cuts at one end. The knife shall then be worked under the coating for 1/2 in. (13 mm) to free the coating from the metal.

Using pliers, the freed tab shall be pulled with a force applied vertically and away from the conduit. The tab shall tear rather than cause any additional coating to separate from the substrate.

A two part urethane coating shall be applied to the interior of the conduit. The internal coating shall have a nominal thickness of 2 mils (50  $\mu\text{m}$ ). The interior coating shall be applied in a manner so there are no runs, drips, or pinholes at any point. The coating shall not peel, flake, or chip off after a cut is made in the conduit or a scratch is made in the coating. The urethane interior coating applied shall afford sufficient flexibility to permit field bending without cracking or flaking of the interior coating.

All conduit fittings and couplings shall be as specified and recommended by the conduit manufacturer. All conduit fitting covers shall be furnished with stainless steel screws which have been encapsulated with a polyester material on the head to ensure maximum corrosion protection.”

80310

**CONCRETE GUTTER, CURB, MEDIAN, AND PAVED DITCH (BDE)**

Effective: April 1, 2014

Revised: August 1, 2014

Add the following to Article 606.02 of the Standard Specifications:

“(i) Polyurethane Joint Sealant ..... 1050.04”

Revise the fifth paragraph of Article 606.07 of the Standard Specifications to read:

“Transverse contraction and longitudinal construction joints shall be sealed according to Article 420.12, except transverse joints in concrete curb and gutter shall be sealed with polysulfide or polyurethane joint sealant.”

Add the following to Section 1050 of the Standard Specifications:

“**1050.04 Polyurethane Joint Sealant.** The joint sealant shall be a polyurethane sealant, Type S, Grade NS, Class 25 or better, Use T (T<sub>1</sub> or T<sub>2</sub>), according to ASTM C 920.”

80334

**CONSTRUCTION AIR QUALITY – DIESEL RETROFIT (BDE)**

Effective: June 1, 2010

Revised: November 1, 2014

The reduction of emissions of particulate matter (PM) for off-road equipment shall be accomplished by installing retrofit emission control devices. The term "equipment" refers to diesel fuel powered devices rated at 50 hp and above, to be used on the jobsite in excess of seven calendar days over the course of the construction period on the jobsite (including rental equipment).

Contractor and subcontractor diesel powered off-road equipment assigned to the contract shall be retrofitted using the phased in approach shown below. Equipment that is of a model year older than the year given for that equipment's respective horsepower range shall be retrofitted:

Effective Dates	Horsepower Range	Model Year
June 1, 2010 <sup>1/</sup>	600-749	2002
	750 and up	2006
June 1, 2011 <sup>2/</sup>	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006
June 1, 2012 <sup>2/</sup>	50-99	2004
	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006

1/ Effective dates apply to Contractor diesel powered off-road equipment assigned to the contract.

2/ Effective dates apply to Contractor and subcontractor diesel powered off-road equipment assigned to the contract.

The retrofit emission control devices shall achieve a minimum PM emission reduction of 50 percent and shall be:

- a) Included on the U.S. Environmental Protection Agency (USEPA) *Verified Retrofit Technology List* (<http://www.epa.gov/cleandiesel/verification/verif-list.htm>), or verified by the California Air Resources Board (CARB) (<http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>); or
- b) Retrofitted with a non-verified diesel retrofit emission control device if verified retrofit emission control devices are not available for equipment proposed to be used on the project, and if the Contractor has obtained a performance certification from the retrofit

device manufacturer that the emission control device provides a minimum PM emission reduction of 50 percent.

Note: Large cranes (Crawler mounted cranes) which are responsible for critical lift operations are exempt from installing retrofit emission control devices if such devices adversely affect equipment operation.

Diesel powered off-road equipment with engine ratings of 50 hp and above, which are unable to be retrofitted with verified emission control devices or if performance certifications are not available which will achieve a minimum 50 percent PM reduction, may be granted a waiver by the Department if documentation is provided showing good faith efforts were made by the Contractor to retrofit the equipment.

Construction shall not proceed until the Contractor submits a certified list of the diesel powered off-road equipment that will be used, and as necessary, retrofitted with emission control devices. The list(s) shall include (1) the equipment number, type, make, Contractor/rental company name; and (2) the emission control devices make, model, USEPA or CARB verification number, or performance certification from the retrofit device manufacturer. Equipment reported as fitted with emissions control devices shall be made available to the Engineer for visual inspection of the device installation, prior to being used on the jobsite.

The Contractor shall submit an updated list of retrofitted off-road construction equipment as retrofitted equipment changes or comes on to the jobsite. The addition or deletion of any diesel powered equipment shall be included on the updated list.

If any diesel powered off-road equipment is found to be in non-compliance with any portion of this special provision, the Engineer will issue the Contractor a diesel retrofit deficiency deduction.

Any costs associated with retrofitting any diesel powered off-road equipment with emission control devices shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed. The Contractor's compliance with this notice and any associated regulations shall not be grounds for a claim.

### **Diesel Retrofit Deficiency Deduction**

When the Engineer determines that a diesel retrofit deficiency exists, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency continues to exist. The calendar day(s) will begin when the time period for correction is exceeded and end with the Engineer's written acceptance of the correction. The daily monetary deduction will be \$1,000.00 for each deficiency identified.

The deficiency will be based on lack of diesel retrofit emissions control.

If a Contractor accumulates three diesel retrofit deficiency deductions for the same piece of equipment in a contract period, the Contractor will be shutdown until the deficiency is corrected.



Such a shutdown will not be grounds for any extension of the contract time, waiver of penalties, or be grounds for any claim.

80261

**CONTRACT CLAIMS (BDE)**

Effective: April 1, 2014

Revise the first paragraph of Article 109.09(a) of the Standard Specifications to read:

“(a) Submission of Claim. All claims filed by the Contractor shall be in writing and in sufficient detail to enable the Department to ascertain the basis and amount of the claim. As a minimum, the following information must accompany each claim submitted.”

Revise Article 109.09(e) of the Standard Specifications to read:

“(e) Procedure. The Department provides two administrative levels for claims review.

- Level I Engineer of Construction
- Level II Chief Engineer/Director of Highways or Designee

- (1) Level I. All claims shall first be submitted at Level I. Two copies each of the claim and supporting documentation shall be submitted simultaneously to the District and the Engineer of Construction. The Engineer of Construction, in consultation with the District, will consider all information submitted with the claim and render a decision on the claim within 90 days after receipt by the Engineer of Construction. Claims not conforming to this Article will be returned without consideration. The Engineer of Construction may schedule a claim presentation meeting if in the Engineer of Construction’s judgment such a meeting would aid in resolution of the claim, otherwise a decision will be made based on the claim documentation submitted. If a Level I decision is not rendered within 90 days of receipt of the claim, or if the Contractor disputes the decision, an appeal to Level II may be made by the Contractor.
- (2) Level II. An appeal to Level II shall be made in writing to the Engineer of Construction within 45 days after the date of the Level I decision. Review of the claim at Level II shall be conducted as a full evaluation of the claim. A claim presentation meeting may be scheduled if the Chief Engineer/Director of Highways determines that such a meeting would aid in resolution of the claim, otherwise a decision will be made based on the claim documentation submitted. A Level II final decision will be rendered within 90 days of receipt of the written request for appeal.

Full compliance by the Contractor with the provisions specified in this Article is a contractual condition precedent to the Contractor’s right to seek relief in the Court of Claims. The Director’s written decision shall be the final administrative action of the Department. Unless the Contractor files a claim for adjudication by the Court of Claims within 60 days after the date of the written decision, the failure to file shall constitute a release and waiver of the claim.”

## **DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (DBE)**

Effective: September 1, 2000

Revised: August 2, 2011

FEDERAL OBLIGATION. The Department of Transportation, as a recipient of federal financial assistance, is required to take all necessary and reasonable steps to ensure nondiscrimination in the award and administration of contracts. Consequently, the federal regulatory provisions of 49 CFR Part 26 apply to this contract concerning the utilization of disadvantaged business enterprises. For the purposes of this Special Provision, a disadvantaged business enterprise (DBE) means a business certified by the Department in accordance with the requirements of 49 CFR Part 26 and listed in the Illinois Unified Certification Program (IL UCP) DBE Directory.

STATE OBLIGATION. This Special Provision will also be used by the Department to satisfy the requirements of the Business Enterprise for Minorities, Females, and Persons with Disabilities Act, 30 ILCS 575. When this Special Provision is used to satisfy state law requirements on 100 percent state-funded contracts, the federal government has no involvement in such contracts (not a federal-aid contract) and no responsibility to oversee the implementation of this Special Provision by the Department on those contracts. DBE participation on 100 percent state-funded contracts will not be credited toward fulfilling the Department's annual overall DBE goal required by the US Department of Transportation to comply with the federal DBE program requirements.

CONTRACTOR ASSURANCE. The Contractor makes the following assurance and agrees to include the assurance in each subcontract that the Contractor signs with a subcontractor.

The Contractor, subrecipient, or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of contracts funded in whole or in part with federal or state funds. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate.

OVERALL GOAL SET FOR THE DEPARTMENT. As a requirement of compliance with 49 CFR Part 26, the Department has set an overall goal for DBE participation in its federally assisted contracts. That goal applies to all federal-aid funds the Department will expend in its federally assisted contracts for the subject reporting fiscal year. The Department is required to make a good faith effort to achieve the overall goal. The dollar amount paid to all approved DBE companies performing work called for in this contract is eligible to be credited toward fulfillment of the Department's overall goal.

CONTRACT GOAL TO BE ACHIEVED BY THE CONTRACTOR. This contract includes a specific DBE utilization goal established by the Department. The goal has been included because the Department has determined that the work of this contract has subcontracting opportunities that may be suitable for performance by DBE companies. The determination is

based on an assessment of the type of work, the location of the work, and the availability of DBE companies to do a part of the work. The assessment indicates that, in the absence of unlawful discrimination, and in an arena of fair and open competition, DBE companies can be expected to perform 17.00 % of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set for in this Special Provision:

- (a) The bidder documents that enough DBE participation has been obtained to meet the goal: or
- (b) The bidder documents that a good faith effort has been made to meet the goal, even though the effort did not succeed in obtaining enough DBE participation to meet the goal.

DBE LOCATOR REFERENCES. Bidders shall consult the IL UCP DBE Directory as a reference source for DBE-certified companies. In addition, the Department maintains a letting and item specific DBE locator information system whereby DBE companies can register their interest in providing quotes on particular bid items advertised for letting. Information concerning DBE companies willing to quote work for particular contracts may be obtained by contacting the Department's Bureau of Small Business Enterprises at telephone number (217)785-4611, or by visiting the Department's website at [www.dot.il.gov](http://www.dot.il.gov).

BIDDING PROCEDURES. Compliance with this Special Provision is a material bidding requirement. The failure of the bidder to comply will render the bid not responsive.

- (a) The bidder shall submit a Disadvantaged Business Utilization Plan on Department forms SBE 2025 and 2026 with the bid.
- (b) The Utilization Plan shall indicate that the bidder either has obtained sufficient DBE participation commitments to meet the contract goal or has not obtained enough DBE participation commitments in spite of a good faith effort to meet the goal. The Utilization Plan shall further provide the name, telephone number, and telefax number of a responsible official of the bidder designated for purposes of notification of plan approval or disapproval under the procedures of this Special Provision.
- (c) The Utilization Plan shall include a DBE Participation Commitment Statement, Department form SBE 2025, for each DBE proposed for the performance of work to achieve the contract goal. For bidding purposes, submission of the completed SBE 2025 forms, signed by the DBEs and faxed to the bidder will be acceptable as long as the original is available and provided upon request. All elements of information indicated on the said form shall be provided, including but not limited to the following:
  - (1) The names and addresses of DBE firms that will participate in the contract;

- (2) A description, including pay item numbers, of the work each DBE will perform;
- (3) The dollar amount of the participation of each DBE firm participating. The dollar amount of participation for identified work shall specifically state the quantity, unit price, and total subcontract price for the work to be completed by the DBE. If partial pay items are to be performed by the DBE, indicate the portion of each item, a unit price where appropriate and the subcontract price amount;
- (4) DBE Participation Commitment Statements, form SBE 2025, signed by the bidder and each participating DBE firm documenting the commitment to use the DBE subcontractors whose participation is submitted to meet the contract goal;
- (5) if the bidder is a joint venture comprised of DBE companies and non-DBE companies, the plan must also include a clear identification of the portion of the work to be performed by the DBE partner(s); and,
- (6) If the contract goal is not met, evidence of good faith efforts.

GOOD FAITH EFFORT PROCEDURES. The contract will not be awarded until the Utilization Plan submitted by the apparent successful bidder is approved. All information submitted by the bidder must be complete, accurate and adequately document that enough DBE participation has been obtained or document that good faith efforts of the bidder, in the event enough DBE participation has not been obtained, before the Department will commit to the performance of the contract by the bidder. The Utilization Plan will be approved by the Department if the Utilization Plan documents sufficient commercially useful DBE work performance to meet the contract goal or the bidder submits sufficient documentation of a good faith effort to meet the contract goal pursuant to 49 CFR Part 26, Appendix A. The Utilization Plan will not be approved by the Department if the Utilization Plan does not document sufficient DBE participation to meet the contract goal unless the apparent successful bidder documented in the Utilization Plan that it made a good faith effort to meet the goal. This means that the bidder must show that all necessary and reasonable steps were taken to achieve the contract goal. Necessary and reasonable steps are those which, by their scope, intensity and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not successful. The Department will consider the quality, quantity, and intensity of the kinds of efforts that the bidder has made. Mere *pro forma* efforts, in other words, efforts done as a matter of form, are not good faith efforts; rather, the bidder is expected to have taken genuine efforts that would be reasonably expected of a bidder actively and aggressively trying to obtain DBE participation sufficient to meet the contract goal.

- (a) The following is a list of types of action that the Department will consider as part of the evaluation of the bidder's good faith efforts to obtain participation. These listed factors are not intended to be a mandatory checklist and are not intended to be exhaustive. Other factors or efforts brought to the attention of the Department may be relevant in appropriate cases, and will be considered by the Department.

- (1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBE companies that have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBE companies to respond to the solicitation. The bidder must determine with certainty if the DBE companies are interested by taking appropriate steps to follow up initial solicitations.
- (2) Selecting portions of the work to be performed by DBE companies in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime Contractor might otherwise prefer to perform these work items with its own forces.
- (3) Providing interested DBE companies with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
- (4) a. Negotiating in good faith with interested DBE companies. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBE companies that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBE companies to perform the work.  
  
b. A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBE companies is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidders are not, however, required to accept higher quotes from DBE companies if the price difference is excessive or unreasonable.
- (5) Not rejecting DBE companies as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.

- (6) Making efforts to assist interested DBE companies in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.
  - (7) Making efforts to assist interested DBE companies in obtaining necessary equipment, supplies, materials, or related assistance or services.
  - (8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE companies.
- (b) If the Department determines that the apparent successful bidder has made a good faith effort to secure the work commitment of DBE companies to meet the contract goal, the Department will award the contract provided that it is otherwise eligible for award. If the Department determines that the bidder has failed to meet the requirements of this Special Provision or that a good faith effort has not been made, the Department will notify the responsible company official designated in the Utilization Plan that the bid is not responsive. The notification shall include a statement of reasons for the determination.
- (c) The bidder may request administrative reconsideration of a determination adverse to the bidder within the five working days after the receipt of the notification date of the determination by delivering the request to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764 (Telefax: (217)785-1524). Deposit of the request in the United States mail on or before the fifth business day shall not be deemed delivery. The determination shall become final if a request is not made and delivered. A request may provide additional written documentation and/or argument concerning the issues raised in the determination statement of reasons, provided the documentation and arguments address efforts made prior to submitting the bid. The request will be forwarded to the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person in order to consider all issues of documentation and whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for consideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

CALCULATING DBE PARTICIPATION. The Utilization Plan values represent work anticipated to be performed and paid for upon satisfactory completion. The Department is only able to count toward the achievement of the overall goal and the contract goal the value of payments made for the work actually performed by DBE companies. In addition, a DBE must perform a commercially useful function on the contract to be counted. A commercially useful function is

generally performed when the DBE is responsible for the work and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. The Department and Contractor are governed by the provisions of 49 CFR Part 26.55(c) on questions of commercially useful functions as it affects the work. Specific counting guidelines are provided in 49 CFR Part 26.55, the provisions of which govern over the summary contained herein.

- (a) DBE as the Contractor: 100 percent goal credit for that portion of the work performed by the DBE's own forces, including the cost of materials and supplies. Work that a DBE subcontracts to a non-DBE does not count toward the DBE goals.
- (b) DBE as a joint venture Contractor: 100 percent goal credit for that portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work performed by the DBE's own forces.
- (c) DBE as a subcontractor: 100 percent goal credit for the work of the subcontract performed by the DBE's own forces, including the cost of materials and supplies, excluding the purchase of materials and supplies or the lease of equipment by the DBE subcontractor from the prime Contractor or its affiliates. Work that a DBE subcontractor in turn subcontracts to a non-DBE does not count toward the DBE goal.
- (d) DBE as a trucker: 100 percent goal credit for trucking participation provided the DBE is responsible for the management and supervision of the entire trucking operation for which it is responsible. At least one truck owned, operated, licensed, and insured by the DBE must be used on the contract. Credit will be given for the following:
  - (1) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
  - (2) The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement.
- (e) DBE as a material supplier:
  - (1) 60 percent goal credit for the cost of the materials or supplies purchased from a DBE regular dealer.
  - (2) 100 percent goal credit for the cost of materials or supplies obtained from a DBE manufacturer.
  - (3) 100 percent credit for the value of reasonable fees and commissions for the procurement of materials and supplies if not a regular dealer or manufacturer.



CONTRACT COMPLIANCE. Compliance with this Special Provision is an essential part of the contract. The Department is prohibited by federal regulations from crediting the participation of a DBE included in the Utilization Plan toward either the contract goal or the Department's overall goal until the amount to be applied toward the goals has been paid to the DBE. The following administrative procedures and remedies govern the compliance by the Contractor with the contractual obligations established by the Utilization Plan. After approval of the Utilization Plan and award of the contract, the Utilization Plan and individual DBE Participation Statements become part of the contract. If the Contractor did not succeed in obtaining enough DBE participation to achieve the advertised contract goal, and the Utilization Plan was approved and contract awarded based upon a determination of good faith, the total dollar value of DBE work calculated in the approved Utilization Plan as a percentage of the awarded contract value shall become the amended contract goal. All work indicated for performance by an approved DBE shall be performed, managed, and supervised by the DBE executing the Participation Statement.

- (a) NO AMENDMENT. No amendment to the Utilization Plan may be made without prior written approval from the Department's Bureau of Small Business Enterprises. All requests for amendment to the Utilization Plan shall be submitted to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764. Telephone number (217)785-4611. Telefax number (217)785-1524.
- (b) TERMINATION OR REPLACEMENT. The Contractor shall not terminate or replace a DBE listed on the approved Utilization Plan, or perform with other forces work designated for a listed DBE except as provided in the Special Provision.
- (c) CHANGES TO WORK. Any deviation from the DBE condition-of-award or contract plans, specifications, or special provisions must be approved, in writing, by the Department as provided elsewhere in the Contract. The Contractor shall notify affected DBEs in writing of any changes in the scope of work which result in a reduction in the dollar amount condition-of-award to the contract. Where the revision includes work committed to a new DBE subcontractor, not previously involved in the project, then a Request for Approval of Subcontractor, Department form BC 260A, must be signed and submitted. If the commitment of work is in the form of additional tasks assigned to an existing subcontract, then a new Request for Approval of Subcontractor shall not be required. However, the Contractor must document efforts to assure that the existing DBE subcontractor is capable of performing the additional work and has agreed in writing to the change.
- (d) ALTERNATIVE WORK METHODS. In addition to the above requirements for reductions in the condition of award, additional requirements apply to the two cases of Contractor-initiated work substitution proposals. Where the contract allows alternate work methods which serve to delete or create underruns in condition of award DBE work, and the Contractor selects that alternate method or, where the Contractor proposes a substitute work method or material that serves to diminish or delete work committed to a DBE and replace it with other work, then the Contractor must demonstrate one of the following:

- (1) That the replacement work will be performed by the same DBE (as long as the DBE is certified in the respective item of work) in a modification of the condition of award; or
- (2) That the DBE is aware that its work will be deleted or will experience underruns and has agreed in writing to the change. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so; or
- (3) That the DBE is not capable of performing the replacement work or has declined to perform the work at a reasonable competitive price. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so.

(e) TERMINATION AND REPLACEMENT PROCEDURES. The Contractor shall not terminate or replace a DBE subcontractor listed in the approved Utilization Plan without prior written consent. This includes, but is not limited to, instances in which the Contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm. Written consent will be granted only if the Bureau of Small Business Enterprises agrees, for reasons stated in its concurrence document, that the Contractor has good cause to terminate or replace the DBE firm. Before transmitting to the Bureau of Small Business Enterprises any request to terminate and/or substitute a DBE subcontractor, the Contractor shall give notice in writing to the DBE subcontractor, with a copy to the Bureau, of its intent to request to terminate and/or substitute, and the reason for the request. The Contractor shall give the DBE five days to respond to the Contractor's notice. The DBE so notified shall advise the Bureau and the Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why the Bureau should not approve the Contractor's action. If required in a particular case as a matter of public necessity, the Bureau may provide a response period shorter than five days.

For purposes of this paragraph, good cause includes the following circumstances:

- (1) The listed DBE subcontractor fails or refuses to execute a written contract;
- (2) The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor;
- (3) The listed DBE subcontractor fails or refuses to meet the prime Contractor's reasonable, nondiscriminatory bond requirements;

- (4) The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
- (5) The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1,200 or applicable state law.
- (6) You have determined that the listed DBE subcontractor is not a responsible contractor;
- (7) The listed DBE subcontractor voluntarily withdraws from the projects and provides to you written notice of its withdrawal;
- (8) The listed DBE is ineligible to receive DBE credit for the type of work required;
- (9) A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the contract;
- (10) Other documented good cause that compels the termination of the DBE subcontractor. Provided, that good cause does not exist if the prime Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the prime Contractor can self-perform the work for which the DBE contractor was engaged or so that the prime Contractor can substitute another DBE or non-DBE contractor after contract award.

When a DBE is terminated, or fails to complete its work on the Contract for any reason the Contractor shall make a good faith effort to find another DBE to substitute for the original DBE to perform at least the same amount of work under the contract as the terminated DBE to the extent needed to meet the established Contract goal.

- (f) PAYMENT RECORDS. The Contractor shall maintain a record of payments for work performed to the DBE participants. The records shall be made available to the Department for inspection upon request. After the performance of the final item of work or delivery of material by a DBE and final payment therefore to the DBE by the Contractor, but not later than thirty calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Agreement on Department form SBE 2115 to the Regional Engineer. If full and final payment has not been made to the DBE, the DBE Payment Agreement shall indicate whether a disagreement as to the payment required exists between the Contractor and the DBE or if the Contractor believes that the work has not been satisfactorily completed. If the Contractor does not have the full amount of work indicated in the Utilization Plan performed by the BDE companies indicated in the Utilization Plan and after good faith efforts are reviewed, the Department may deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages. The Contractor may request an administrative

| reconsideration of any amount deducted as damages pursuant to subsection (h) of this part.

| (g) ENFORCEMENT. The Department reserves the right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be made on the contract until such time as the Contractor submits sufficient documentation demonstrating achievement of the goal in accordance with this Special Provision or after liquidated damages have been determined and collected.

| (h) RECONSIDERATION. Notwithstanding any other provision of the contract, including but not limited to Article 109.09 of the Standard Specifications, the Contractor may request administrative reconsideration of a decision to deduct the amount of the goal not achieved as liquidated damages. A request to reconsider shall be delivered to the Contract Compliance Section and shall be handled and considered in the same manner as set forth in paragraph (c) of "Good Faith Effort Procedures" of this Special Provision, except a final decision that a good faith effort was not made during contract performance to achieve the goal agreed to in the Utilization Plan shall be the final administrative decision of the Department.

80029

## FRICITION AGGREGATE (BDE)

Effective: January 1, 2011

Revised: November 1, 2014

Revise Article 1004.01(a)(4) of the Standard Specifications to read:

- “(4) Crushed Stone. Crushed stone shall be the angular fragments resulting from crushing undisturbed, consolidated deposits of rock by mechanical means. Crushed stone shall be divided into the following, when specified.
- a. Carbonate Crushed Stone. Carbonate crushed stone shall be either dolomite or limestone. Dolomite shall contain 11.0 percent or more magnesium oxide (MgO). Limestone shall contain less than 11.0 percent magnesium oxide (MgO).
  - b. Crystalline Crushed Stone. Crystalline crushed stone shall be either metamorphic or igneous stone, including but is not limited to, quartzite, granite, rhyolite and diabase.”

Revise Article 1004.03(a) of the Standard Specifications to read:

“**1004.03 Coarse Aggregate for Hot-Mix Asphalt (HMA).** The aggregate shall be according to Article 1004.01 and the following.

(a) Description. The coarse aggregate for HMA shall be according to the following table.

Use	Mixture	Aggregates Allowed
Class A	Seal or Cover	<u>Allowed Alone or in Combination</u> <sup>5/</sup> : Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag Crushed Concrete

Use	Mixture	Aggregates Allowed
HMA Low ESAL	Stabilized Subbase or Shoulders	<u>Allowed Alone or in Combination</u> <sup>5/</sup> : Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag <sup>1/</sup> Crushed Concrete
HMA High ESAL Low ESAL	Binder IL-19.0 or IL-19.0L  SMA Binder	<u>Allowed Alone or in Combination</u> <sup>5/</sup> : Crushed Gravel Carbonate Crushed Stone <sup>2/</sup> Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Concrete <sup>3/</sup>
HMA High ESAL Low ESAL	C Surface and Leveling Binder IL-9.5 or IL-9.5L  SMA Ndesign 50 Surface	<u>Allowed Alone or in Combination</u> <sup>5/</sup> : Crushed Gravel Carbonate Crushed Stone <sup>2/</sup> Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag <sup>4/</sup> Crushed Concrete <sup>3/</sup>
HMA High ESAL	D Surface and Leveling Binder IL-9.5  SMA Ndesign 50 Surface	<u>Allowed Alone or in Combination</u> <sup>5/</sup> : Crushed Gravel Carbonate Crushed Stone (other than Limestone) <sup>2/</sup> Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag <sup>4/</sup> Crushed Concrete <sup>3/</sup>
		<u>Other Combinations Allowed:</u>
		<i>Up to...</i> <i>With...</i>
		25% Limestone                      Dolomite

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

Use	Mixture	Aggregates Allowed	
		<i>Up to...</i>	<i>With...</i>
		50% Crushed Gravel, Crushed Concrete <sup>3/</sup> , or Dolomite <sup>2/</sup>	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone

- 1/ Crushed steel slag allowed in shoulder surface only.
- 2/ Carbonate crushed stone shall not be used in SMA Ndesign 80. In SMA Ndesign 50, carbonate crushed stone shall not be blended with any of the other aggregates allowed alone in Ndesign 50 SMA binder or Ndesign 50 SMA surface.
- 3/ Crushed concrete will not be permitted in SMA mixes.
- 4/ Crushed steel slag shall not be used as leveling binder.
- 5/ When combinations of aggregates are used, the blend percent measurements shall be by volume."

80265



## GRANULAR MATERIALS (BDE)

Effective: November 1, 2012

Revise the title of Article 1003.04 of the Standard Specifications to read:

**"1003.04 Fine Aggregate for Bedding, Trench Backfill, Embankment, Porous Granular Backfill, Sand Backfill for Underdrains, and French Drains."**

Revise Article 1003.04(c) of the Standard Specifications to read:

"(c) Gradation. The fine aggregate gradations for granular embankment, granular backfill, bedding, and trench backfill for pipe culverts and storm sewers shall be FA 1, FA 2, or FA 6 through FA 21.

The fine aggregate gradation for porous granular embankment, porous granular backfill, french drains, and sand backfill for underdrains shall be FA 1, FA 2, or FA 20, except the percent passing the No. 200 (75  $\mu$ m) sieve shall be  $2\pm 2$ ."

Revise Article 1004.05(c) of the Standard Specifications to read:

"(c) Gradation. The coarse aggregate gradations shall be as follows.

Application	Gradation
Blotter	CA 15
Granular Embankment, Granular Backfill, Bedding, and Trench Backfill for Pipe Culverts and Storm Sewers	CA 6, CA 9, CA 10, CA 12, CA17, CA18, and CA 19
Porous Granular Embankment, Porous Granular Backfill, and French Drains	CA 7, CA 8, CA 11, CA 15, CA 16 and CA 18"

80303

## HOT-MIX ASPHALT - DENSITY TESTING OF LONGITUDINAL JOINTS (BDE)

Effective: January 1, 2010

Revised: April 1, 2012

Description. This work shall consist of testing the density of longitudinal joints as part of the quality control/quality assurance (QC/QA) of hot-mix asphalt (HMA). Work shall be according to Section 1030 of the Standard Specifications except as follows.

Quality Control/Quality Assurance (QC/QA). Delete the second and third sentence of the third paragraph of Article 1030.05(d)(3) of the Standard Specifications.

Add the following paragraphs to the end of Article 1030.05(d)(3) of the Standard Specifications:

“Longitudinal joint density testing shall be performed at each random density test location. Longitudinal joint testing shall be located at a distance equal to the lift thickness or a minimum of 4 in. (100 mm), from each pavement edge. (i.e. for a 5 in. (125 mm) lift the near edge of the density gauge or core barrel shall be within 5 in. (125 mm) from the edge of pavement.) Longitudinal joint density testing shall be performed using either a correlated nuclear gauge or cores.

- a. Confined Edge. Each confined edge density shall be represented by a one-minute nuclear density reading or a core density and shall be included in the average of density readings or core densities taken across the mat which represents the Individual Test.
- b. Unconfined Edge. Each unconfined edge joint density shall be represented by an average of three one-minute density readings or a single core density at the given density test location and shall meet the density requirements specified herein. The three one-minute readings shall be spaced ten feet apart longitudinally along the unconfined pavement edge and centered at the random density test location.”

Revise the Density Control Limits table in Article 1030.05(d)(4) of the Standard Specifications to read:

"Mixture Composition	Parameter	Individual Test (includes confined edges)	Unconfined Edge Joint Density Minimum
IL-4.75	Ndesign = 50	93.0 – 97.4%	91.0%
IL-9.5, IL-12.5	Ndesign ≥ 90	92.0 – 96.0%	90.0%
IL-9.5, IL-9.5L, IL-12.5	Ndesign < 90	92.5 – 97.4%	90.0%
IL-19.0, IL-25.0	Ndesign ≥ 90	93.0 – 96.0%	90.0%
IL-19.0, IL-19.0L, IL-25.0	Ndesign < 90	93.0 – 97.4%	90.0%

SMA	Ndesign = 50 & 80	93.5 - 97.4%	91.0%
All Other	Ndesign = 30	93.0 - 97.4%	90.0%"

80246

**HOT MIX ASPHALT – PRIME COAT (BDE)**

Effective: November 1, 2014

Revise Note 1 of Article 406.02 of the Standard Specifications to read:

“Note 1. The bituminous material used for prime coat shall be one of the types listed in the following table.

When emulsified asphalts are used, any dilution with water shall be performed by the emulsion producer. The emulsified asphalt shall be thoroughly agitated within 24 hours of application and show no separation of water and emulsion.

Application	Bituminous Material Types
Prime Coat on Brick, Concrete, or HMA Bases	SS-1, SS-1h, SS-1hP, SS-1vh, RS-1, RS-2, CSS-1, CSS-1h, CSS-1hp, CRS-1, CRS-2, HFE-90, RC-70
Prime Coat on Aggregate Bases	MC-30, PEP”

Add the following to Article 406.03 of the Standard Specifications.

- “(i) Vacuum Sweeper ..... 1101.19
- “(j) Spray Paver ..... 1102.06”

Revise Article 406.05(b) of the Standard Specifications to read:

“(b) Prime Coat. The bituminous material shall be prepared according to Article 403.05 and applied according to Article 403.10. The use of RC-70 shall be limited to air temperatures less than 60 °F (15 °C).

- (1) Brick, Concrete or HMA Bases. The base shall be cleaned of all dust, debris and any substance that will prevent the prime coat from adhering to the base. Cleaning shall be accomplished by sweeping to remove all large particles and air blasting to remove dust. As an alternative to air blasting, a vacuum sweeper may be used to accomplish the dust removal. The base shall be free of standing water at the time of application. The prime coat shall be applied uniformly and at a rate that will provide a residual asphalt rate on the prepared surface as specified in the following table.

Type of Surface to be Primed	Residual Asphalt Rate lb/sq ft (kg/sq m)
Milled HMA, Aged Non-Milled HMA, Milled Concrete, Non-Milled Concrete & Tined Concrete	0.05 (0.244)
Fog Coat between HMA Lifts, IL-4.75 & Brick	0.025 (0.122)

The bituminous material for the prime coat shall be placed one lane at a time. If a spray paver is not used, the primed lane shall remain closed until the prime coat is

fully cured and does not pickup under traffic. When placing prime coat through an intersection where it is not possible to keep the lane closed, the prime coat may be covered immediately following its application with fine aggregate mechanically spread at a uniform rate of 2 to 4 lb/sq yd (1 to 2 kg/sq m).

- (2) Aggregate Bases. The prime coat shall be applied uniformly and at a rate that will provide a residual asphalt rate on the prepared surface of 0.25 lb/sq ft  $\pm$  0.01 (1.21 kg/sq m  $\pm$ 0.05).

The prime coat shall be permitted to cure until the penetration has been approved by the Engineer, but at no time shall the curing period be less than 24 hours for MC-30 or four hours for PEP. Pools of prime occurring in the depressions shall be broomed or squeegeed over the surrounding surface the same day the prime coat is applied.

The base shall be primed 1/2 width at a time. The prime coat on the second half/width shall not be applied until the prime coat on the first half/width has cured so that it will not pickup under traffic.

The residual asphalt rate will be verified a minimum of once per type of surface to be primed as specified herein for which at least 2000 tons (1800 metric tons) of HMA will be placed. The test will be according to the "Determination of Residual Asphalt in Prime and Tack Coat Materials" test procedure.

Prime coat shall be fully cured prior to placement of HMA to prevent pickup by haul trucks or paving equipment. If pickup occurs, paving shall cease in order to provide additional cure time, and all areas where the pickup occurred shall be repaired.

If after five days, loss of prime coat is evident prior to covering with HMA, additional prime coat shall be placed as determined by the Engineer at no additional cost to the Department."

Revise the last sentence of the first paragraph of Article 406.13(b) of the Standard Specifications to read:

"Water added to emulsified asphalt, as allowed in Article 406.02, will not be included in the quantities measured for payment."

Revise the second paragraph of Article 406.13(b) of the Standard Specifications to read:

"Aggregate for covering prime coat will not be measured for payment."

Revise the first paragraph of Article 406.14 of the Standard Specifications to read:

**"406.14 Basis of Payment.** Prime Coat will be paid for at the contract unit price per pound (kilogram) of residual asphalt applied for BITUMINOUS MATERIALS (PRIME COAT), or POLYMERIZED BITUMINOUS MATERIALS (PRIME COAT)."

Revise Article 407.02 of the Standard Specifications to read:

**407.02 Materials.** Materials shall be according to Article 406.02, except as follows.

Item	Article/Section
(a) Packaged Rapid Hardening Mortar or Concrete .....	1018”

Revise Article 407.06(b) of the Standard Specifications to read:

“(b) A bituminous prime coat shall be applied between each lift of HMA according to Article 406.05(b).”

Delete the second paragraph of Article 407.12 of the Standard Specifications.

Revise the first paragraph of Article 408.04 of the Standard Specifications to read:

**408.04 Method of Measurement.** Bituminous priming material will be measured for payment according to Article 406.13.”

Revise the first paragraph of Article 408.05 of the Standard Specifications to read:

**408.05 Basis of Payment.** This work will be paid for at the contract unit price per pound (kilogram) of residual asphalt applied for BITUMINOUS MATERIALS (PRIME COAT) or POLYMERIZED BITUMINOUS MATERIALS (PRIME COAT) and at the contract unit price per ton (metric ton) for INCIDENTAL HOT-MIX ASPHALT SURFACING.”

Revise Article 1032.02 of the Standard Specifications to read:

**1032.02 Measurement.** Asphalt binders, emulsified asphalts, rapid curing liquid asphalt, medium curing liquid asphalts, slow curing liquid asphalts, asphalt fillers, and road oils will be measured by weight.

A weight ticket for each truck load shall be furnished to the inspector. The truck shall be weighed at a location approved by the Engineer. The ticket shall show the weight of the empty truck (the truck being weighed each time before it is loaded), the weight of the loaded truck, and the net weight of the bituminous material.

When an emulsion or cutback is used for prime coat, the percentage of asphalt residue of the actual certified product shall be shown on the producer’s bill of lading or attached certificate of analysis. If the producer adds extra water to an emulsion at the request of the purchaser, the amount of water shall also be shown on the bill of lading.

Payment will not be made for bituminous materials in excess of 105 percent of the amount specified by the Engineer.”

Add the following to the table in Article 1032.04 of the Standard Specifications.

"SS-1vh	160-180	70-80
RS-1, CRS-1	75-130	25-55"

Add the following to Article 1032.06 of the Standard Specifications.

"(g) Non Tracking Emulsified Asphalt SS-1vh shall be according to the following.

Requirements for SS-1vh			
Test		SPEC	AASHTO Test Method
Saybolt Viscosity @ 25C,	SFS	20-200	T 72
Storage Stability, 24hr.,	%	1 max.	T 59
Residue by Evaporation,	%	50 min.	T 59
Sieve Test,	%	0.3 max.	T 59
Tests on Residue from Evaporation			
Penetration @25°C, 100g., 5 sec., dmm		20 max.	T 49
Softening Point,	°C	65 min.	T 53
Solubility,	%	97.5 min.	T 44
Orig. DSR @ 82°C,	kPa	1.00 min.	T 315"

Revise the last table in Article 1032.06(f)(2)d. of the Standard Specifications to read:

"Grade	Use
SS-1, SS-1h, RS-1, RS-2, CSS-1, CRS-1, CRS-2, CSS-1h, HFE-90, SS-1hP, CSS-1hP, SS-1vh	Prime or fog seal
PEP	Bituminous surface treatment prime
RS-2, HFE-90, HFE-150, HFE- 300, CRSP, HFP, CRS-2, HFRS-2	Bituminous surface treatment
CSS-1h Latex Modified	Microsurfacing"

Add the following to Article 1101 of the Standard Specifications.

**"1101.19 Vacuum Sweeper.** The vacuum sweeper shall have a minimum sweeping path of 52 in. (1.3 m) and a minimum blower rating of 20,000 cu ft per minute (566 cu m per minute)."

Add the following to Article 1102 of the Standard Specifications:

**"1102.06 Spray Paver.** The spreading and finishing machine shall be capable of spraying a rapid setting emulsion tack coat, paving a layer of HMA, and providing a smooth HMA mat in one pass. The HMA shall be spread over the tack coat in less than five seconds after the

application of the tack coat during normal paving speeds. No wheel or other part of the paving machine shall come into contact with the tack coat before the HMA is applied. In addition to meeting the requirements of Article 1102.03, the spray paver shall also meet the requirements of Article 1102.05 for the tank, heating system, pump, thermometer, tachometer or synchronizer, and calibration. The spray bar shall be equipped with properly sized and spaced nozzles to apply a uniform application of tack coat at the specified rate for the full width of the mat being placed.”

80348



## LRFD PIPE CULVERT BURIAL TABLES (BDE)

Effective: November 1, 2013

Revised: November 1, 2014

Revise Article 542.02 of the Standard Specifications to read as follows:

"Item	Article/Section
(a) Galvanized Corrugated Steel Pipe .....	1006.01
(b) Galvanized Corrugated Steel Pipe Arch .....	1006.01
(c) Bituminous Coated Corrugated Steel Pipe .....	1006.01
(d) Bituminous Coated Corrugated Steel Pipe Arch .....	1006.01
(e) Reserved	
(f) Aluminized Steel Type 2 Corrugated Pipe .....	1006.01
(g) Aluminized Steel Type 2 Corrugated Pipe Arch .....	1006.01
(h) Precoated Galvanized Corrugated Steel Pipe .....	1006.01
(i) Precoated Galvanized Corrugated Steel Pipe Arch .....	1006.01
(j) Corrugated Aluminum Alloy Pipe .....	1006.03
(k) Corrugated Aluminum Alloy Pipe Arch .....	1006.03
(l) Extra Strength Clay Pipe .....	1040.02
(m) Concrete Sewer, Storm Drain, and Culvert Pipe .....	1042
(n) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe .....	1042
(o) Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe.....	1042
(p) Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe .....	1042
(q) Polyvinyl Chloride (PVC) Pipe .....	1040.03
(r) Corrugated Polyvinyl Chloride (PVC) Pipe with a Smooth Interior .....	1040.03
(s) Corrugated Polypropylene (CPP) pipe with smooth Interior .....	1040.07
(t) Corrugated Polyethylene (PE) Pipe with a Smooth Interior .....	1040.04
(u) Polyethylene (PE) Pipe with a Smooth Interior .....	1040.04
(v) Rubber Gaskets and Preformed Flexible Joint Sealants for Concrete Pipe .....	1056
(w) Mastic Joint Sealer for Pipe .....	1055
(x) External Sealing Band .....	1057
(y) Fine Aggregate (Note 1) .....	1003.04
(z) Coarse Aggregate (Note 2) .....	1004.05
(aa) Packaged Rapid Hardening Mortar or Concrete .....	1018
(bb) Nonshrink Grout .....	1024.02
(cc) Reinforcement Bars and Welded Wire Fabric .....	1006.10
(dd) Handling Hole Plugs .....	1042.16

Note 1. The fine aggregate shall be moist.

Note 2. The coarse aggregate shall be wet."

Revise the table for permitted materials in Article 542.03 of the Standard Specifications as follows:

"Class	Materials
A	Rigid Pipes: Extra Strength Clay Pipe Concrete Sewer Storm Drain and Culvert Pipe, Class 3 Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
C	Rigid Pipes: Extra Strength Clay Pipe Concrete Sewer Storm Drain and Culvert Pipe, Class 3 Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe Flexible Pipes: Aluminized Steel Type 2 Corrugated Pipe Aluminized Steel Type 2 Corrugated Pipe Arch Precoated Galvanized Corrugated Steel Pipe Precoated Galvanized Corrugated Steel Pipe Arch Corrugated Aluminum Alloy Pipe Corrugated Aluminum Alloy Pipe Arch Polyvinyl Chloride (PVC) Pipe Corrugated Polyvinyl Chloride (PVC) Pipe with a Smooth Interior Polyethylene (PE) Pipe with a Smooth Interior Corrugated Polypropylene (CPP) Pipe with Smooth Interior
D	Rigid Pipes: Extra Strength Clay Pipe Concrete Sewer Storm Drain and Culvert Pipe, Class 3 Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe Flexible Pipes: Galvanized Corrugated Steel Pipe Galvanized Corrugated Steel Pipe Arch Bituminous Coated Corrugated Steel Pipe Bituminous Coated Corrugated Steel Pipe Arch Aluminized Steel Type 2 Corrugated Pipe Aluminized Steel Type 2 Corrugated Pipe Arch Precoated Galvanized Corrugated Steel Pipe Precoated Galvanized Corrugated Steel Pipe Arch Corrugated Aluminum Alloy Pipe Corrugated Aluminum Alloy Pipe Arch Polyvinyl Chloride (PVC) Pipe Corrugated Polyvinyl Chloride (PVC) Pipe with a Smooth Interior Corrugated Polyethylene (PE) Pipe with a Smooth Interior Polyethylene (PE) Pipe with a Smooth Interior Corrugated Polypropylene (CPP) Pipe with Smooth Interior

Revise Articles 542.03(b) and (c) of the Standard Specifications to read:

- “(b) Extra strength clay pipe will only be permitted for pipe culverts Type 1, for 10 in., 12 in., 42 in. and 48 in. (250 mm, 300 mm, 1050 mm and 1200 mm), Types 2, up to and including 48 in. (1200 mm), Type 3, up to and including 18 in. (450 mm), Type 4 up to and including 10 in. (250 mm), for all pipe classes.
- (c) Concrete sewer, storm drain, and culvert pipe Class 3 will only be permitted for pipe culverts Type 1, up to and including 10 in (250 mm), Type 2, up to and including 30 in. (750 mm), Type 3, up to and including 15 in. (375 mm); Type 4, up to and including 10 in. (250 mm), for all pipe classes.”

Replace the pipe tables in Article 542.03 of the Standard Specifications with the following:

"Table IA: Classes of Reinforced Concrete Pipe for the Respective Diameters of Pipe and Fill Heights over the Top of the Pipe							
Nominal Diameter in.	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7
	Fill Height: 3' and less 1' min cover	Fill Height: Greater than 3' not exceeding 10'	Fill Height: Greater than 10' not exceeding 15'	Fill Height: Greater than 15' not exceeding 20'	Fill Height: Greater than 20' not exceeding 25'	Fill Height: Greater than 25' not exceeding 30'	Fill Height: Greater than 30' not exceeding 35'
12	IV	II	III	IV	IV	V	V
15	IV	II	III	IV	IV	V	V
18	IV	II	III	IV	IV	V	V
21	III	II	III	IV	IV	V	V
24	III	II	III	IV	IV	V	V
30	IV	II	III	IV	IV	V	V
36	III	II	III	IV	IV	V	V
42	II	II	III	IV	IV	V	V
48	II	II	III	IV	IV	V	V
54	II	II	III	IV	IV	V	V
60	II	II	III	IV	IV	V	V
66	II	II	III	IV	IV	V	V
72	II	II	III	IV	IV	V	V
78	II	II	III	IV	IV	V	V
84	II	II	III	IV	IV	V	V
90	II	II	III	IV	V	V	V
96	II	III	III	1680	2020	2370	2730
102	II	III	III	1690	2040	2380	2740
108	II	III	III	1700	2050	2390	2750
108	II	III	1360	1710	2060	2410	2760
108	II	III	1360	1710	2060	2410	2770

Notes:

A number indicates the D-Load for the diameter and depth of fill and that a special design is required.  
Design assumptions; Water filled pipe, Type 2 bedding and Class C Walls

Table IA: Classes of Reinforced Concrete Pipe  
for the Respective Diameters of Pipe and Fill Heights over the Top of the Pipe  
(Metric)

Nominal Diameter mm	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7
	Fill Height:	Fill Height:	Fill Height:	Fill Height:	Fill Height:	Fill Height:	Fill Height:
	1 m and less 0.3 m min cover	Greater than 1 m not exceeding 3 m	Greater than 3 m not exceeding 4.5 m	Greater than 4.5 m not exceeding 6 m	Greater than 6 m not exceeding 7.5 m	Greater than 7.5 m not exceeding 9 m	Greater than 9 m not exceeding 10.5 m
300	IV	II	III	IV	IV	V	V
375	IV	II	III	IV	IV	V	V
450	IV	II	III	IV	IV	V	V
525	III	II	III	IV	IV	V	V
600	III	II	III	IV	IV	V	V
750	IV	II	III	IV	IV	V	V
900	III	II	III	IV	IV	V	V
1050	II	II	III	IV	IV	V	V
1200	II	II	III	IV	IV	V	V
1350	II	II	III	IV	IV	V	V
1500	II	II	III	IV	IV	V	V
1650	II	II	III	IV	IV	V	V
1800	II	II	III	IV	IV	V	V
1950	II	II	III	IV	IV	V	V
2100	II	II	III	IV	IV	V	V
2250	II	II	III	IV	V	V	V
2400	II	II	III	IV	100	110	130
2550	II	II	III	IV	100	110	130
2700	II	II	III	IV	100	110	130

Notes:

A number indicates the D-Load for the diameter and depth of fill and that a special design is required.  
Design assumptions: Water filled pipe, Type 2 bedding and Class C Walls

TABLE IB: THICKNESS OF CORRUGATED STEEL PIPE FOR THE RESPECTIVE DIAMETER OF PIPE AND FILL HEIGHTS OVER THE TOP OF THE PIPE FOR 2 2/3"x1/2", 3"x1" AND 5"x1" CORRUGATIONS

Nominal Diameter 5"	Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7	
	Fill Height: 3' and less 1' min. cover		Fill Height: Greater than 3' not exceeding 10'		Fill Height: Greater than 10' not exceeding 15'		Fill Height: Greater than 15' not exceeding 20'		Fill Height: Greater than 20' not exceeding 25'		Fill Height: Greater than 25' not exceeding 30'		Fill Height: Greater than 30' not exceeding 35'	
	2 2/3" x 1/2"	3"x1" 5"x1"	2 2/3" x 1/2"	3"x1" 5"x1"	2 2/3" x 1/2"	3"x1" 5"x1"	2 2/3" x 1/2"	3"x1" 5"x1"	2 2/3" x 1/2"	3"x1" 5"x1"	2 2/3" x 1/2"	3"x1" 5"x1"	2 2/3" x 1/2"	3"x1" 5"x1"
12	0.064		0.064		0.064		0.064		0.064		0.064		0.064	
15	0.064		0.064		0.064		0.064		0.064		0.064		0.064	
18	(0.079)		0.064		0.064		0.064		0.064		(0.079)		(0.079)	
21	(0.079)		0.064		0.064		0.064		(0.079)		(0.079)		(0.079)	
24	(0.079)		0.064		0.064		0.064		(0.079)		(0.079)		(0.109)	
30	(0.109E)		0.064		0.064		(0.079)		(0.079)		(0.109)		0.109	
36	(0.109E)		0.064		(0.079)		(0.079)		(0.109)		0.109		(0.138E)	
42	0.079		0.064		(0.079)		(0.079)		(0.109)		(0.109E)		(0.109E)	
48	0.109	(0.109)	0.079	0.079	0.079	0.079	0.079	0.109	0.109	0.109	0.109	0.109	0.109	0.109
54	0.109	(0.109)	0.079	0.079	0.079	0.079	0.079	0.109	0.109	0.109	0.109	0.109	0.109	0.109
60	0.109	(0.109)	0.079	0.079	0.079	0.079	0.079	0.109	0.109	0.109	0.109	0.109	0.109	0.109
66	(0.138)	0.109	0.079	0.079	0.079	0.079	0.079	0.109	0.109	0.109	0.109	0.109	0.109	0.109
72	0.138	0.109	0.138	0.109	0.138	0.109	0.138	0.109	0.138	0.138	0.138	0.138	0.138	0.138
78	0.168	0.109	0.168	0.109	0.168	0.109	0.168	0.109	0.168	0.168	0.168	0.168	0.168	0.168
84	0.168	(0.138)	0.168	0.109	0.168	0.109	0.168	0.109	0.168	0.168	0.168	0.168	0.168	0.168
90		(0.138)	0.168	0.109	0.168	0.109	0.168	0.109	0.168	0.168	0.168	0.168	0.168	0.168
96		(0.138)	0.168	0.109	0.168	0.109	0.168	0.109	0.168	0.168	0.168	0.168	0.168	0.168
102		0.109Z	0.109Z	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109
108		0.109Z	0.138Z	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109
114		0.109Z	0.138Z	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109
120		0.109Z	0.138Z	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109
126		0.138Z	0.138Z	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
132		0.138Z	0.138Z	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
138		0.138Z	0.138Z	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
144		0.168Z	0.168Z	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168

Notes:  
 \* Aluminized Type 2 Steel or Precoated Galvanized Steel shall be required for diameters up to 42" according to Article 1006.01, 1 1/2" x 1/4" corrugations shall be used for diameters less than 12".  
 Thicknesses are based on longitudinal riveted seam fabrication, values in "()" can be reduced by one gage thickness if helical seam fabrication is utilized.  
 A thickness preceded by "H" indicates only helical seam fabrication is allowed.  
 E Elongation according to Article 5.42.04(e)  
 Z 1'-6" Minimum fill

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TABLE IB: THICKNESS OF CORRUGATED STEEL PIPE FOR THE RESPECTIVE DIAMETER OF PIPE AND FILL HEIGHTS OVER THE TOP OF THE PIPE FOR 68 mm x 13 mm, 75 mm x 25 mm AND 125 mm x 25 mm CORRUGATIONS (Metric)														
Nominal Diameter mm*	Type 1 Fill Height:		Type 2 Fill Height:		Type 3 Fill Height:		Type 4 Fill Height:		Type 5 Fill Height:		Type 6 Fill Height:		Type 7 Fill Height:	
	1 m and less 0.3 m min. cover	Greater than 1 m not exceeding 3 m	Greater than 3 m not exceeding 4.5 m	Greater than 4.5 m not exceeding 6 m	Greater than 6 m not exceeding 7.5 m	Greater than 7.5 m not exceeding 9 m	Greater than 9 m not exceeding 10.5 m							
300	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm
375	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63
450	(2.01)	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	(2.01)	(2.01)
525	(2.01)	1.63	1.63	1.63	1.63	1.63	1.63	1.63	(2.01)	(2.01)	(2.01)	(2.01)	(2.01)	(2.01)
600	(2.01)	1.63	1.63	1.63	1.63	1.63	1.63	1.63	(2.01)	(2.01)	(2.01)	(2.01)	(2.01)	(2.01)
750	(2.77E)	1.63	1.63	1.63	1.63	1.63	1.63	1.63	(2.01)	(2.01)	(2.01)	(2.01)	(2.01)	(2.01)
900	(2.77E)	1.63	1.63	1.63	1.63	1.63	1.63	1.63	(2.01)	(2.01)	(2.01)	(2.01)	(2.01)	(2.01)
1050	2.01	1.63	1.63	1.63	1.63	1.63	1.63	1.63	(2.01)	(2.01)	(2.01)	(2.01)	(2.01)	(2.01)
1200	2.77	(2.77)	2.01	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01
1350	2.77	(2.77)	2.01	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01
1500	2.77	(2.77)	2.01	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01
1650	(3.51)	2.77	2.01	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01
1800	3.51	2.77	2.01	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01
1950	4.27	2.77	2.01	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01	(2.77)	2.01
2100	4.27	(3.51)	2.77	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77
2250	(3.51)	(3.51)	2.77	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77
2400	(3.51)	(3.51)	2.77	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77
2550	2.77Z	2.77Z	2.77	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77
2700	2.77Z	(3.51Z)	2.77	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77
2850		(3.51Z)	2.77	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77
3000	2.77Z	(3.51Z)	2.77	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77	(2.77)	2.77
3150	3.51Z	3.51Z	3.51	3.51	(3.51)	3.51	(3.51)	3.51	(3.51)	3.51	(3.51)	3.51	(3.51)	3.51
3300	3.51Z	3.51Z	3.51	3.51	(3.51)	3.51	(3.51)	3.51	(3.51)	3.51	(3.51)	3.51	(3.51)	3.51
3450	3.51Z	3.51Z	3.51	3.51	(3.51)	3.51	(3.51)	3.51	(3.51)	3.51	(3.51)	3.51	(3.51)	3.51
3600	4.27Z	4.27Z	4.27	4.27	(4.27)	4.27	(4.27)	4.27	(4.27)	4.27	(4.27)	4.27	(4.27)	4.27

Notes:  
 \* Aluminized Type 2 Steel or Precoated Galvanized Steel shall be required for diameters up to 1050 mm according to Article 1006.01, 38 mm x 6.5 mm corrugations shall be used for diameters less than 300 mm.  
 Thicknesses are based on longitudinal riveted seam fabrication, values in "( )" can be reduced by one gage thickness if helical seam fabrication is utilized.  
 A thickness preceded by an "H" indicates only helical seam fabrication is allowed.  
 E Elongation according to Article 542.04(e)  
 Z 450 mm Minimum Fill

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TABLE IC: THICKNESS OF CORRUGATED ALUMINUM ALLOY PIPE FOR THE RESPECTIVE DIAMETER OF PIPE AND FILL HEIGHTS OVER THE TOP OF THE PIPE FOR 2 2/3"x1/2" AND 3"x1" CORRUGATIONS														
Nominal Diameter	Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7	
	Fill Height:	3' and less 1' min. cover	Fill Height:	Greater than 3' not exceeding 10'	Fill Height:	Greater than 10' not exceeding 15'	Fill Height:	Greater than 15' not exceeding 20'	Fill Height:	Greater than 20' not exceeding 25'	Fill Height:	Greater than 25' not exceeding 30'	Fill Height:	Greater than 30' not exceeding 35'
	2 2/3"x1/2"	3"x1"	2 2/3"x1/2"	3"x1"	2 2/3"x1/2"	3"x1"	2 2/3"x1/2"	3"x1"	2 2/3"x1/2"	3"x1"	2 2/3"x1/2"	3"x1"	2 2/3"x1/2"	3"x1"
12	(0.075)		0.060		0.060		0.060		0.060		0.060		0.060	
15	(0.075)		0.060		0.060		0.060		0.060		0.060		0.060	
18	(0.075)		0.060		0.060		0.060		0.060		0.060		0.060	
21	H 0.060E		0.060		0.060		0.060		0.060		0.060		0.060	
24	(0.105E)		0.060		0.060		0.060		0.060		0.060		0.060	
30	H 0.075E		0.075	H 0.060	0.075	H 0.060	0.075	H 0.060	0.075	H 0.060	0.075	H 0.060	0.075	H 0.060
36	(0.135E)	H 0.060E	0.075	H 0.060	0.075	H 0.060	0.105	H 0.060	0.105	H 0.060	0.105	H 0.060	0.105	H 0.060
42	0.105E	(0.075)	0.105	0.060	0.105	0.060	0.105	0.060	0.105	0.060	0.105	0.060	0.105	0.060
48	0.105E	(0.075)	0.105	0.060	0.105	0.060	0.105	0.060	0.105	0.060	0.105	0.060	0.105	0.060
54	0.105E	(0.105)	0.105	0.060	0.105	0.060	0.105	0.060	0.105	0.060	0.105	0.060	0.105	0.060
60	0.135E	(0.105)	0.135	0.060	0.135	(0.075)	0.135	(0.105)	0.135	(0.105)	0.135	(0.105)	0.135	(0.105)
66	0.164E	(0.105)	0.164	0.060	0.164	(0.075)	0.164	(0.105)	0.164	(0.105)	0.164	(0.105)	0.164	(0.105)
72	0.164E	(0.105)	0.164	0.060	0.164	(0.075)	0.164	(0.105)	0.164	(0.105)	0.164	(0.105)	0.164	(0.105)
78		(0.135)	0.075	0.075	0.105	(0.105)	0.105	(0.105)	0.105	(0.105)	0.105	(0.105)	0.105	(0.105)
84		(0.135)	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105
90		(0.135)	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105
96		(0.135)	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105
102		0.135Z	0.135	0.135	0.135	0.135	0.135	0.135	0.135	0.135	0.135	0.135	0.135	0.135
108		0.135Z	0.135	0.135	0.135	0.135	0.135	0.135	0.135	0.135	0.135	0.135	0.135	0.135
114		0.164Z	0.164	0.164	0.164	0.164	0.164	0.164	0.164	0.164	0.164	0.164	0.164	0.164
120		0.164Z	0.164	0.164	0.164	0.164	0.164	0.164	0.164	0.164	0.164	0.164	0.164	0.164

Notes:  
 Thicknesses are based on longitudinal riveted seam fabrication, values in "( )" can be reduced by one gage thickness if helical seam fabrication is utilized.  
 A thickness preceded by an "H" indicates only helical seam fabrication is allowed.  
 E Elongation according to Article 542.04(e), the elongation requirement for Type 1 fill heights may be eliminated for fills above 1'-6"  
 Z 1"-6" Minimum fill

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**TABLE IC: THICKNESS OF CORRUGATED ALUMINUM ALLOY PIPE  
FOR THE RESPECTIVE DIAMETER OF PIPE AND FILL HEIGHTS OVER THE TOP OF THE PIPE  
FOR 68 mm x 13 mm AND 75 mm x 25 mm CORRUGATIONS  
(Metric)**

Nominal Diameter mm	Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7	
	Fill Height: 1 m and less 0.3 m min. cover		Fill Height: Greater than 1 m not exceeding 3 m		Fill Height: Greater than 3 m not exceeding 4.5 m		Fill Height: Greater than 4.5 m not exceeding 6 m		Fill Height: Greater than 6 m not exceeding 7.5 m		Fill Height: Greater than 7.5 m not exceeding 9 m		Fill Height: Greater than 9 m not exceeding 10.5 m	
	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm
300	(1.91)		1.52		1.52		1.52		1.52		1.52		1.52	
375	(1.91)		1.52		1.52		1.52		1.52		1.52		(1.91)	
450	(1.91)		1.52		1.52		1.52		1.52		(1.91)		H 1.52	
525	H 1.52E		1.52		1.52		1.52		(1.91)		H 1.52		H 1.52E	
600	(2.67E)		1.52		1.52		(1.91)		(2.67)		(2.67)		(2.67E)	
750	H 1.91E	H 1.52	1.91	H 1.52	1.91	H 1.52	(2.67)	H 1.52	(2.67)	H 1.52	H 1.91E	H 1.52	H 1.91E	H 1.52
900	(3.43E)	H 1.52E	1.91	H 1.52	(2.67)	H 1.52	(2.67)	H 1.52	(3.43)	H 1.52	H 1.91E	H 1.52	H 1.91E	H 1.52E
1050	2.67E	(1.91)	2.67	1.52	2.67	1.52	2.67	1.52	2.67	(1.91)	2.67E	2.67	2.67E	(2.67E)
1200	2.67E	(1.91)	2.67	1.52	2.67	1.52	2.67	(1.91)	2.67	(2.67)	2.67E	2.67E	2.67E	(3.43E)
1350	2.67E	(2.67)	2.67	1.52	2.67	1.52	2.67	(1.91)	2.67	(2.67)	2.67E	2.67E	2.67E	(3.43E)
1500	3.43E	(2.67)	3.43	1.52	3.43	(1.91)	3.43	(2.67)	3.43	(2.67)	3.43E	3.43E	3.43E	(3.43E)
1650	4.17E	(2.67)	4.17	1.52	4.17	(1.91)	4.17	(2.67)	4.17	(3.43)	4.17E	4.17E	4.17E	(3.43E)
1800	4.17E	(2.67)	4.17	1.52	4.17	(1.91)	4.17	(2.67)	4.17	(3.43)	4.17E	4.17E	4.17E	(4.17E)
1950		(3.43)	1.91		(2.67)		(2.67)		(3.43)		(3.43E)		(4.17E)	
2100		(3.43)	2.67		2.67		(3.43)		(3.43)		(4.17E)		(4.17E)	
2250		(3.43)	2.67		2.67		(3.43)		(3.43)		(4.17E)		(4.17E)	
2400		(3.43)	2.67		2.67		(3.43)		(3.43)		(4.17E)		H 3.43E	
2550		3.43Z	3.43		3.43		3.43		(4.17)		(4.17E)		H 3.43E	
2700		3.43Z	3.43		3.43		3.43		(4.17)		(4.17E)		H 4.17E	
2850		4.17Z	4.17		4.17		4.17		4.17		H 4.17E		H 4.17E	
3000		4.17Z	4.17		4.17		4.17		4.17		H 4.17E		H 4.17E	

Notes:

Thicknesses are based on longitudinal riveted seam fabrication, values in "( )" can be reduced by one gage thickness if helical seam fabrication is utilized.  
 A thickness preceded by an "H" indicates only helical seam fabrication is allowed.  
 E Elongation according to Article 542.04(e), the elongation requirement for Type 1 fill heights may be eliminated for fills above 450 mm.  
 Z 450 mm Minimum fill

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Table IIA: THICKNESS FOR CORRUGATED STEEL PIPE ARCHES AND CORRUGATED ALUMINUM ALLOY PIPE ARCHES FOR THE RESPECTIVE EQUIVALENT ROUND SIZE OF PIPE AND FILL HEIGHTS OVER THE TOP OF PIPE												
Equivalent Round Size (in.)	Corrugated Steel & Aluminum Pipe Arch 2 2/3" x 1 1/2"			Corrugated Steel & Aluminum Pipe Arch 3" x 1"			Corrugated Steel Pipe Arch 5" x 1"			Min. Cover		
	Span (in.)	Rise (in.)	Type 1 Fill Height: 3' and less	Span (in.)	Rise (in.)	Type 1 Fill Height: 3' and less	Span (in.)	Rise (in.)	Type 2 Fill Height: Greater than 3' not exceeding 10'	Span (in.)	Rise (in.)	Type 3 Fill Height: Greater than 10' not exceeding 15'
15	17	13	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
18	21	15	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
21	24	18	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
24	28	20	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)
30	35	24	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.105)
36	42	29	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.105)
42	49	33	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.105
48	57	38	(0.109)	(0.109)	(0.109)	(0.109)	(0.109)	(0.109)	(0.109)	(0.109)	(0.109)	0.105
54	64	43	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.135
60	71	47	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.164
66	77	52	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.164
72	83	57	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.164
78	87	63	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.105
84	95	67	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.105
90	103	71	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.135
96	112	75	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.164
102	117	79	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.164
108	128	83	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
114	137	87	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
120	142	91	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168

Notes:

\* Aluminum Type 2 Steel or Precoated Galvanized Steel shall be required for steel spans up to 42" according to Article 1006.01. Thicknesses are based on longitudinal riveted seam fabrication, values in "( )" can be reduced by one gage thickness if helical seam fabrication is utilized. The Type 1 corrugated steel or aluminum pipe arches shall be placed on soil having a minimum bearing capacity of 3 tons per square foot. The Type 2 and 3 corrugated steel or aluminum pipe arches shall be placed on soil having a minimum bearing capacity of 2 tons per square foot. This minimum bearing capacity will be determined by the Engineer in the field.

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Table IIA: THICKNESS FOR CORRUGATED STEEL PIPE ARCHES AND CORRUGATED ALUMINUM ALLOY PIPE ARCHES FOR THE RESPECTIVE EQUIVALENT ROUND SIZE OF PIPE AND FILL HEIGHTS OVER THE TOP OF PIPE (Metric)

Equivalent Round Size (mm)	Corrugated Steel & Aluminum Pipe Arch 68 x 13 mm		Corrugated Steel & Aluminum Pipe Arch 75 x 25 mm		Corrugated Steel Pipe Arch 125 x 25 mm		Min. Cover	Type 1 Fill Height: 1 m and less						Type 2 Fill Height: Greater than 1 m not exceeding 3 m						Type 3 Fill Height: Greater than 3 m not exceeding 4.5 m					
	Span Rise (mm)*		Span Rise (mm)		Span Rise (mm)			Steel & Aluminum	Steel		Aluminum		Steel		Aluminum		Steel		Aluminum		Steel		Aluminum		
	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm		68 x 13 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	
375	430	330					0.5 m	1.63					1.63				1.63					1.63			
450	530	380					0.5 m	1.63					1.63				1.63					1.63			
525	610	460					0.5 m	1.63					1.63				1.63					1.63			
600	710	510					0.5 m	(2.01)					1.63				1.91					1.91			
750	870	630					0.5 m	(2.01)					1.63				1.91					(2.67)			
900	1060	740					0.5 m	(2.01)					1.63				2.67					2.67			
1050	1240	840					0.5 m	2.77					2.67				2.67					2.67			
1200	1440	970	1340	1050	1340	1050	0.5 m	2.77	(2.77)			3.43	1.52			2.01	3.43	1.52			2.77	2.01	1.52		
1350	1620	1100	1520	1170	1520	1170	0.5 m	2.77	(2.77)			4.17	(1.91)			2.01	4.17	1.52			2.77	2.01	1.52		
1500	1800	1200	1670	1300	1670	1300	0.5 m	3.51	(2.77)			4.17	(1.91)			2.01	4.17	1.52			2.77	2.01	1.52		
1650	1950	1320	1850	1400	1850	1400	0.5 m	4.27	(2.77)			1.91	1.91			2.01	4.27	1.91			2.77	2.01	1.91		
1800	2100	1450	2050	1500	2050	1500	0.5 m	4.27	(2.77)			2.67	2.67			2.01	4.27	2.67			2.77	2.01	2.67		
1950			2200	1620	2200	1620	0.5 m		2.77			2.67	2.67			(2.77)	2.77	2.67			2.77	2.77	2.67		
2100			2400	1720	2400	1720	0.5 m		2.77			2.67	2.67			(2.77)	2.77	2.67			2.77	2.77	2.67		
2250			2600	1820	2600	1820	0.5 m		2.77			3.43	3.43			(2.77)	2.77	3.43			2.77	2.77	3.43		
2400			2840	1920	2840	1920	0.5 m		2.77			4.17	4.17			2.77	2.77	4.17			2.77	(3.51)	4.17		
2550			2970	2020	2970	2020	0.5 m		2.77			4.17	4.17			2.77	2.77	4.17			2.77	(3.51)	4.17		
2700			3240	2120	3240	2120	0.5 m		3.51			3.51	3.51			3.51	3.51	3.51			3.51	3.51	3.51		
2850			3470	2220	3470	2220	0.5 m		3.51			3.51	3.51			3.51	3.51	3.51			3.51	3.51	3.51		
3000			3600	2320	3600	2320	0.5 m		4.27			4.27	4.27			4.27	4.27	4.27			4.27	4.27	4.27		

Notes:

- \* Aluminized Type 2 Steel or Precoated Galvanized Steel shall be required for steel spans up to 1060 mm according to Article 1006.01.
- Thicknesses are based on longitudinal riveted seam fabrication, values in "()" can be reduced by one gage thickness if helical seam fabrication is utilized.
- The Type 1 corrugated steel or aluminum pipe arches shall be placed on soil having a minimum bearing capacity of 290 kN per square meter.
- The Type 2 and 3 corrugated steel or aluminum pipe arches shall be placed on soil having a minimum bearing capacity of 192 kN per square meter.
- This minimum bearing capacity will be determined by the Engineer in the field.

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Table IIB: CLASSES OF REINFORCED CONCRETE ELLIPTICAL AND REINFORCED CONCRETE ARCH PIPE FOR THE RESPECTIVE EQUIVALENT ROUND SIZE OF PIPE AND FILL HEIGHTS OVER THE TOP OF PIPE											
Equivalent Round Size (in.)	Reinforced Concrete Elliptical pipe (in.)		Reinforced Concrete Arch pipe (in.)		Minimum Cover	Type 1		Type 2		Type 3	
	Span	Rise	Span	Rise		RCCP HE & A	HE	Arch	HE	Arch	HE
15	23	14	18	11	RCCP HE & A	HE-III	Arch	HE	Arch	HE	Arch
18	23	14	22	13 1/2	1'-0"	HE-III	A-III	HE-III	A-III	HE-IV	A-IV
21	30	19	26	15 1/2	1'-0"	HE-III	A-III	HE-III	A-III	HE-IV	A-IV
24	30	19	28 1/2	18	1'-0"	HE-III	A-III	HE-III	A-III	HE-IV	A-IV
27	34	22	36 1/4	22 1/2	1'-0"	HE-III	A-III	HE-III	A-III	HE-IV	A-IV
30	38	24	36 1/4	22 1/2	1'-0"	HE-III	A-III	HE-III	A-III	HE-IV	A-IV
36	45	29	43 3/4	26 5/8	1'-0"	HE-II	A-II	HE-III	A-III	HE-IV	A-IV
42	53	34	51 1/8	31 5/16	1'-0"	HE-I	A-I	HE-III	A-III	HE-IV	A-IV
48	60	38	58 1/2	36	1'-0"	HE-I	A-I	HE-III	A-III	1460	1450
54	68	43	65	40	1'-0"	HE-I	A-I	HE-III	A-III	1460	1460
60	76	48	73	45	1'-0"	HE-I	A-I	HE-III	A-III	1460	1470
66	83	53	88	54	1'-0"	HE-I	A-I	HE-III	A-III	1470	1480
72	91	58	88	54	1'-0"	HE-I	A-I	HE-III	A-III	1470	1480

Notes:

A number indicates the D-Load for the diameter and depth of fill and that a special design is required.  
 Design assumptions: Water filled pipe, AASHTO Type 2 installation per AASHTO LRFD Table 12.10.2.1-1

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Table 11B: CLASSES OF REINFORCED CONCRETE ELLIPTICAL AND REINFORCED CONCRETE ARCH PIPE FOR THE RESPECTIVE EQUIVALENT ROUND SIZE OF PIPE AND FILL HEIGHTS OVER THE TOP OF PIPE (Metric)											
Equivalent Round Size (mm)	Reinforced Concrete Elliptical pipe (mm)		Reinforced Concrete Arch pipe (mm)		Minimum Cover	Type 1		Type 2		Type 3	
	Span	Rise	Span	Rise		HE	Arch	HE	Arch	HE	Arch
375	584	356	457	279	RCCP HE & A	HE	Arch	HE	Arch	HE	Arch
450	584	356	559	343	0.3 m	HE-III	A-III	HE-III	A-III	HE-IV	A-IV
525	762	483	660	394	0.3 m	HE-III	A-III	HE-III	A-III	HE-IV	A-IV
600	762	483	724	457	0.3 m	HE-III	A-III	HE-III	A-III	HE-IV	A-IV
686	864	559	921	572	0.3 m	HE-III	A-III	HE-III	A-III	HE-IV	A-IV
750	965	610	921	572	0.3 m	HE-III	A-III	HE-III	A-III	HE-IV	A-IV
900	1143	737	1111	676	0.3 m	HE-II	A-II	HE-III	A-III	HE-IV	A-IV
1050	1346	864	1299	795	0.3 m	HE-I	A-II	HE-III	A-III	HE-IV	A-IV
1200	1524	965	1486	914	0.3 m	HE-I	A-II	HE-III	A-III	70	70
1350	1727	1092	1651	1016	0.3 m	HE-I	A-II	HE-III	A-III	70	70
1500	1930	1219	1854	1143	0.3 m	HE-I	A-II	HE-III	A-III	70	70
1676	2108	1346	2235	1372	0.3 m	HE-I	A-II	HE-III	A-III	70	70
1800	2311	1473	2235	1372	0.3 m	HE-I	A-II	HE-III	A-III	70	70

Notes:

A number indicates the D-Load for the diameter and depth of fill and that a special design is required.  
 Design assumptions; Water filled pipe, AASHTO Type 2 installation per AASHTO LRFD Table 12.10.2.1-1

TABLE IIIA: PLASTIC PIPE PERMITTED FOR A GIVEN PIPE DIAMETER AND FILL HEIGHT OVER THE TOP OF THE PIPE

Nominal Diameter (in.)	Type 1 Fill Height: 3' and less, with 1' min						Type 2 Fill Height: Greater than 3', not exceeding 10'						Type 3 Fill Height: Greater than 10', not exceeding 15'						Type 4 Fill Height: Greater than 15', not exceeding 20'										
	PVC		CPVC		PE		CPE		CPP		PVC		CPVC		PE		CPE		CPP		PVC		CPVC		PE		CPP		
10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
15	X	X	NA	X	X	X	X	X	X	X	X	X	X	X	NA	X	X	X	X	X	X	X	X	X	X	X	X	X	
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
21	X	X	NA	NA	NA	NA	NA	NA	NA	NA	X	X	X	X	NA	X	X	X	X	X	X	X	X	X	X	X	X	X	
24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
36	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
42	X	NA	X	X	X	X	X	X	NA	NA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
48	X	NA	X	X	X	X	X	X	NA	NA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Notes:  
PVC Polyvinyl Chloride (PVC) pipe with a smooth interior  
CPVC Corrugated Polyvinyl Chloride (CPVC) pipe with a smooth interior  
PE Polyethylene (PE) pipe with a smooth interior  
CPE Corrugated Polyethylene (PE) pipe with a smooth interior  
CPP Corrugated Polypropylene (CPP) pipe with a smooth interior  
X This material may be used for the given pipe diameter and fill height  
NA Not Available

TABLE IIIA: PLASTIC PIPE PERMITTED FOR A GIVEN PIPE DIAMETER AND FILL HEIGHT OVER THE TOP OF THE PIPE (Metric)																						
Nominal Diameter (mm)	Type 1 Fill Height: 1 m and less, with 0.3 m min. cover						Type 2 Fill Height: Greater than 1 m, not exceeding 3 m						Type 3 Fill Height: Greater than 3 m, not exceeding 4.5 m				Type 4 Fill Height: Greater than 4.5 m, not exceeding 6 m					
	PVC	CPVC	PE	CPE	CPP		PVC	CPVC	PE	CPE	CPP		PVC	CPVC	PE	CPE	CPP	PVC	CPVC	PE	CPP	
	250	X	X	X	X	NA	X	X	X	X	NA	X	X	X	X	X	X	NA	X	X	X	NA
300	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NA
375	X	X	NA	X	X	X	X	NA	X	X	X	X	X	X	NA	NA	X	X	X	X	NA	X
450	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NA	X	X	X	X	X	NA
525	X	X	NA	NA	NA	X	X	NA	NA	NA	NA	X	X	X	NA	NA	NA	X	X	X	NA	NA
600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NA	NA	NA	X	X	X	X	NA
750	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NA	NA	X	X	X	X	NA
900	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NA	NA	X	X	X	X	NA
1000	X	NA	X	X	NA	X	NA	X	NA	NA	NA	X	X	X	X	NA	NA	X	X	NA	NA	NA
1200	X	NA	X	X	X	X	NA	X	NA	NA	NA	X	X	X	X	NA	NA	X	X	NA	NA	NA

Notes:

- PVC Polyvinyl Chloride (PVC) pipe with a smooth interior
- CPVC Corrugated Polyvinyl Chloride (CPVC) pipe with a smooth interior
- PE Polyethylene (PE) pipe with a smooth interior
- CPE Corrugated Polyethylene (PE) pipe with a smooth interior
- CPP Corrugated Polypropylene (CPP) pipe with a smooth interior
- X This material may be used for the given pipe diameter and fill height
- NA Not Available

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TABLE IIIIB: PLASTIC PIPE PERMITTED FOR A GIVEN PIPE DIAMETER AND FILL HEIGHT OVER THE TOP OF THE PIPE									
Nominal Diameter (in.)	Type 5				Type 6				Type 7
	Fill Height: Greater than 20', not exceeding 25'				Fill Height: Greater than 25', not exceeding 30'				Fill Height: Greater than 30', not exceeding 35'
	PVC	CPVC			PVC	CPVC		CPVC	
10	X	X			X				X
12	X	X			X	X			X
15	X	X			X	X			X
18	X	X			X	X			X
21	X	X			X	X			X
24	X	X			X	X			X
30	X	X			X	X			X
36	X	X			X	X			X
42	X	NA			X	NA			NA
48	X	NA			X	NA			NA

Notes:  
PVC Polyvinyl Chloride (PVC) pipe with a smooth interior  
CPVC Corrugated Polyvinyl Chloride (CPVC) pipe with a smooth interior  
X This material may be used for the given pipe diameter and fill height  
NA Not Available

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TABLE IIIB: PLASTIC PIPE PERMITTED FOR A GIVEN PIPE DIAMETER AND FILL HEIGHT OVER THE TOP OF THE PIPE (metric)									
Nominal Diameter (mm)	Type 5				Type 6				Type 7
	Fill Height: Greater than 6 m, not exceeding 7.5 m				Fill Height: Greater than 7.5 m, not exceeding 9 m				Fill Height: Greater than 9 m, not exceeding 10.5 m
	PVC	CPVC			PVC	CPVC		CPVC	
250	X	X			X	X			X
300	X	X			X	X			X
375	X	X			X	X			X
450	X	X			X	X			X
525	X	X			X	X			X
600	X	X			X	X			X
750	X	X			X	X			X
900	X	X			X	X			X
1000	X	NA			X	NA			NA
1200	X	NA			X	NA			NA

Notes:

- PVC Polyvinyl Chloride (PVC) pipe with a smooth interior
- CPVC Corrugated Polyvinyl Chloride (CPVC) pipe with a smooth interior
- PE Polyethylene (PE) pipe with a smooth interior
- X This material may be used for the given pipe diameter and fill height
- NA Not Available

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Revise the first sentence of the first paragraph of Article 542.04(c) of the Standard Specifications to read:

“Compacted aggregate, at least 4 in. (100 mm) in depth below the pipe culvert, shall be placed the entire width of the trench and for the length of the pipe culvert, except compacted impervious material shall be used for the outer 3 ft (1 m) at each end of the pipe culvert.”

Revise the seventh paragraph of Article 542.04(d) of the Standard Specifications to read:

“PVC, PE and CPP pipes shall be joined according to the manufacturer’s specifications.”

Replace the third sentence of the first paragraph of Article 542.04(h) of the Standard Specifications with the following:

“The total cover required for various construction loadings shall be the responsibility of the Contractor.”

Delete “Table IV : Wheel Loads and Total Cover” in Article 542.04(h) of the Standard Specifications.

Revise the first and second paragraphs of Article 542.04(i) of the Standard Specifications to read:

“(i) Deflection Testing for Pipe Culverts. All PE, PVC and CPP pipe culverts shall be tested for deflection not less than 30 days after the pipe is installed and the backfill compacted. The testing shall be performed in the presence of the Engineer.

For PVC, PE, and CPP pipe culverts with diameters 24 in. (600 mm) or smaller, a mandrel drag shall be used for deflection testing. For PVC, PE, and CPP pipe culverts with diameters over 24 in. (600 mm), deflection measurements other than by a mandrel shall be used.”

Revise Articles 542.04(i)(1) and (2) of the Standard Specifications to read:

“(1) For all PVC pipe: as defined using ASTM D 3034 methodology.

(2) For all PE and CPP pipe: the average inside diameter based on the minimum and maximum tolerances specified in the corresponding ASTM or AASHTO material specifications.”

Revise the second sentence of the second paragraph of Article 542.07 of the Standard Specifications to read:

“When a prefabricated end section is used, it shall be of the same material as the pipe culvert, except for polyethylene (PE), polyvinylchloride (PVC), and polypropylene (PP) pipes which shall have metal end sections.”

Revise the first paragraph of Article 1040.03 of the Standard Specifications to read:

“**1040.03 Polyvinyl Chloride (PVC) Pipe.** Acceptance testing of PVC pipe and fittings shall be accomplished during the same construction season in which they are installed. The section properties shall be according to the manufacturer pre-submitted geometric properties on file with the Department. The manufacturer shall submit written certification that the material meets those properties. The pipe shall meet the following additional requirements.”

Delete Articles 1040.03(e) and (f) of the Standard Specifications.

Revise Articles 1040.04(c) and (d) of the Standard Specifications to read:

“(c) PE Profile Wall Pipe for Insertion Lining. The pipe shall be according to ASTM F 894. When used for insertion lining of pipe culverts, the pipe liner shall have a minimum pipe stiffness of 46 psi (317 kPa) at five percent deflection for nominal inside diameters of 42 in. (1050 mm) or less. For nominal inside diameters of greater than 42 in. (1050 mm), the pipe liner shall have a minimum pipe stiffness of 32.5 psi (225 kPa) at five percent deflection. All sizes shall have wall construction that presents essentially smooth internal and external surfaces.

(d) PE Pipe with a Smooth Interior. The pipe shall be according to ASTM F 714 (DR 32.5) with a minimum cell classification of PE 335434 as defined in ASTM D 3350. The section properties shall be according to the manufacturer pre-submitted geometric properties on file with the Department. The manufacturer shall submit written certification that the material meets those properties and the resin used to manufacture the pipe meets or exceeds the minimum cell classification requirements.”

Add the following to Section 1040 of the Standard Specifications:

“**1040.08 Polypropylene (PP) Pipe.** Storage and handling shall be according to the manufacturer's recommendations, except in no case shall the pipe be exposed to direct sunlight for more than six months. Acceptance testing of the pipe shall be accomplished during the same construction season in which it is installed. The section properties shall be according to the manufacturer pre-submitted geometric properties on file with the Department. The manufacturer shall submit written certification that the material meets those properties. The pipe shall meet the following additional requirements.

(a) Corrugated PP Pipe with a Smooth Interior. The pipe shall be according to AASHTO M 330 (nominal size – 12 to 60 in. (300 to 1500 mm)). The pipe shall be Type S or D.

(b) Perforated Corrugated PP Pipe with A Smooth Interior. The pipe shall be according to AASHTO M 330 (nominal size – 12 to 60 in. (300 to 1500 mm)). The pipe shall be

Type SP. In addition, the top centerline of the pipe shall be marked so that it is readily visible from the top of the trench before backfilling, and the upper ends of the slot perforations shall be a minimum of ten degrees below the horizontal."

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## LRFD STORM SEWER BURIAL TABLES (BDE)

Effective: November 1, 2013

Revised: November 1, 2014

Revise Article 550.02 of the Standard Specifications to read as follows:

"Item	Article Section
(a) Clay Sewer Pipe .....	1040.02
(b) Extra Strength Clay Pipe .....	1040.02
(c) Concrete Sewer, Storm Drain, and Culvert Pipe .....	1042
(d) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe .....	1042
(e) Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe (Note 1) .....	1042
(f) Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe (Note 1) .....	1042
(g) Polyvinyl Chloride (PVC) Pipe .....	1040.03
(h) Corrugated Polyvinyl Chloride (PVC) Pipe with a Smooth Interior .....	1040.03
(i) Corrugated Polypropylene (CPP) Pipe with Smooth Interior .....	1040.07
(j) Rubber Gaskets and Preformed Flexible Joint Sealants for Concrete Pipe .....	1056
(k) Mastic Joint Sealer for Pipe .....	1055
(l) External Sealing Band .....	1057
(m) Fine Aggregate (Note 2) .....	1003.04
(n) Coarse Aggregate (Note 3) .....	1004.05
(o) Reinforcement Bars and Welded Wire Fabric .....	1006.10
(p) Handling Hole Plugs .....	1042.16
(q) Polyethylene (PE) Pipe with a Smooth Interior .....	1040.04
(r) Corrugated Polyethylene (PE) Pipe with a Smooth Interior .....	1040.04

Note 1. The class of elliptical and arch pipe used for various storm sewer sizes and heights of fill shall conform to the requirements for circular pipe.

Note 2. The fine aggregate shall be moist.

Note 3. The coarse aggregate shall be wet."

Revise the table for permitted materials in Article 550.03 of the Standard Specifications as follows:

"Class	Materials
A	Rigid Pipes: Clay Sewer Pipe Extra Strength Clay Pipe Concrete Sewer, Storm Drain, and Culvert Pipe Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
B	Rigid Pipes: Clay Sewer Pipe Extra Strength Clay Pipe Concrete Sewer, Storm Drain, and Culvert Pipe Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe Flexible Pipes: Polyvinyl Chloride (PVC) Pipe Corrugated Polyvinyl Chloride Pipe (PVC) with a Smooth Interior Polyethylene (PE) Pipe with a Smooth Interior Corrugated Polyethylene (PE) Pipe with a Smooth Interior Corrugated Polypropylene (CPP) Pipe with a Smooth Interior"

Replace the storm sewers tables in Article 550.03 of the Standard Specifications with the following:

**STORM SEWERS**  
**KIND OF MATERIAL PERMITTED AND STRENGTH REQUIRED**  
**FOR A GIVEN PIPE DIAMETERS AND FILL HEIGHTS OVER THE TOP OF THE PIPE**

Nominal Diameter in.	Type 1											Type 2					
	Fill Height: 3' and less With 1' minimum cover											Fill Height: Greater than 3' not exceeding 10'					
	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP	
10	NA	3	X	X	X	X	X	NA	1	*X	X	X	X	X	NA		
12	IV	NA	X	X	X	NA	X	II	1	*X	X	X	X	X	X		
15	IV	NA	NA	X	NA	X	X	II	1	*X	X	X	NA	X	X		
18	IV	NA	NA	X	X	X	X	II	2	X	X	X	X	X	X		
21	III	NA	NA	X	X	NA	NA	II	2	X	X	X	NA	NA	NA		
24	III	NA	NA	X	X	X	X	II	2	X	X	X	X	X	X		
27	III	NA	NA	NA	NA	NA	NA	II	3	X	NA	NA	NA	NA	NA		
30	IV	NA	NA	X	X	X	X	II	3	X	X	X	X	X	X		
33	III	NA	NA	NA	NA	NA	NA	II	NA	X	NA	NA	NA	NA	NA		
36	III	NA	NA	X	X	X	X	II	NA	X	X	X	X	X	X		
42	II	NA	X	X	NA	X	X	II	NA	X	X	NA	X	NA	NA		
48	II	NA	X	X	NA	X	X	II	NA	X	X	NA	X	NA	NA		
54	II	NA	NA	NA	NA	NA	NA	II	NA	X	NA	NA	X	NA	NA		
60	II	NA	NA	NA	NA	NA	NA	II	NA	X	NA	NA	X	NA	NA		
66	II	NA	NA	NA	NA	NA	NA	II	NA	X	NA	NA	X	NA	NA		
72	II	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA		
78	II	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA		
84	II	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA		
90	II	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA		
96	II	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA		
102	II	NA	NA	NA	NA	NA	NA	III	NA	NA	NA	NA	NA	NA	NA		
108	II	NA	NA	NA	NA	NA	NA	III	NA	NA	NA	NA	NA	NA	NA		

RCCP Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe  
 CSP Concrete Sewer, Storm drain, and Culvert Pipe  
 PVC Polyvinyl Chloride Pipe  
 CPVC Corrugated Polyvinyl Chloride Pipe  
 PE Polyethylene Pipe with a Smooth Interior  
 ESCP Extra Strength Clay Pipe  
 CPE Corrugated Polyethylene Pipe with a Smooth Interior  
 CPP Corrugated Polypropylene pipe with a Smooth Interior  
 X This material may be used for the given pipe diameter and fill height.  
 NA This material is Not Acceptable for the given pipe diameter and fill height.  
 \* May also use Standard Strength Clay Pipe

6500

**STORM SEWERS (Metric)**  
**KIND OF MATERIAL PERMITTED AND STRENGTH REQUIRED**  
**FOR A GIVEN PIPE DIAMETERS AND FILL HEIGHTS OVER THE TOP OF THE PIPE**

Nominal Diameter in.	Type 1											Type 2					
	Fill Height: 1 m and less With 300 mm minimum cover											Fill Height: Greater than 1 m not exceeding 3 m					
	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP	
250	NA	3	X	X	X	X	X	NA	1	*X	X	X	X	X	NA		
300	IV	NA	X	X	X	X	X	II	1	*X	X	X	X	X	X		
375	IV	NA	NA	X	NA	NA	X	II	1	*X	X	X	NA	X	X		
450	IV	NA	NA	X	X	X	X	II	2	X	X	X	X	X	X		
525	III	NA	NA	X	X	NA	NA	II	2	X	X	X	NA	NA	NA		
600	III	NA	NA	X	X	X	X	II	2	X	X	X	X	X	X		
675	III	NA	NA	NA	NA	NA	NA	II	3	X	NA	NA	NA	NA	NA		
750	IV	NA	NA	X	X	X	X	II	3	X	X	X	X	X	NA		
825	III	NA	NA	NA	NA	NA	NA	II	NA	X	NA	NA	NA	NA	NA		
900	III	NA	NA	X	X	X	X	II	NA	X	X	X	X	X	X		
1050	II	NA	X	X	NA	X	X	II	NA	X	X	NA	X	NA	NA		
1200	II	NA	X	X	NA	X	X	II	NA	X	X	NA	X	NA	NA		
1350	II	NA	NA	NA	NA	NA	NA	II	NA	X	X	NA	X	NA	NA		
1500	II	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA		
1650	II	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA		
1800	II	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA		
1950	II	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA		
2100	II	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA		
2250	II	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA		
2400	II	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA		
2550	II	NA	NA	NA	NA	NA	NA	III	NA	NA	NA	NA	NA	NA	NA		
2700	II	NA	NA	NA	NA	NA	NA	III	NA	NA	NA	NA	NA	NA	NA		

RCCP Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe  
 CSP Concrete Sewer, Storm drain, and Culvert Pipe  
 PVC Polyvinyl Chloride Pipe  
 CPVC Corrugated Polyvinyl Chloride Pipe  
 ESCP Extra Strength Clay Pipe  
 PE Polyethylene Pipe with a Smooth Interior  
 CPE Corrugated Polyethylene Pipe with a Smooth Interior  
 CPP Corrugated Polypropylene pipe with a Smooth Interior  
 X This material may be used for the given pipe diameter and fill height.  
 NA This material is Not Acceptable for the given pipe diameter and fill height.  
 \* May also use Standard Strength Clay Pipe

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STORM SEWERS															
KIND OF MATERIAL PERMITTED AND STRENGTH REQUIRED FOR A GIVEN PIPE DIAMETERS AND FILL HEIGHTS OVER THE TOP OF THE PIPE															
Nominal Diameter in.	Type 3										Type 4				
	Fill Height: Greater than 10' not exceeding 15'										Fill Height: Greater than 15' not exceeding 20'				
	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP	RCCP	CSP	ESCP	PVC	CPVC	PE	CPP
10	NA	2	X	X	X	X	NA	NA	3	X	X	X	X	NA	NA
12	III	2	X	X	X	NA	X	IV	NA	NA	X	X	X	X	NA
15	III	3	X	X	NA	NA	X	IV	NA	NA	X	X	X	NA	X
18	III	NA	X	X	X	NA	X	IV	NA	NA	X	X	X	NA	NA
21	III	NA	NA	X	NA	NA	NA	IV	NA	NA	X	X	NA	NA	NA
24	III	NA	NA	X	X	NA	NA	IV	NA	NA	X	X	X	NA	NA
27	III	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA
30	III	NA	NA	X	X	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA
33	III	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA
36	III	NA	NA	NA	X	NA	NA	IV	NA	NA	X	X	X	NA	NA
42	III	NA	NA	NA	X	X	NA	IV	NA	NA	X	X	NA	NA	NA
48	III	NA	NA	NA	NA	X	NA	IV	NA	NA	X	NA	NA	NA	NA
54	III	NA	NA	NA	NA	NA	NA	IV	NA	NA	X	NA	NA	NA	NA
60	III	NA	NA	NA	NA	NA	NA	IV	NA	NA	X	NA	NA	NA	NA
66	III	NA	NA	NA	NA	NA	NA	IV	NA	NA	X	NA	NA	NA	NA
72	III	NA	NA	NA	NA	NA	NA	IV	NA	NA	X	NA	NA	NA	NA
78	III	NA	NA	NA	NA	NA	NA	IV	NA	NA	X	NA	NA	NA	NA
84	III	NA	NA	NA	NA	NA	NA	IV	NA	NA	X	NA	NA	NA	NA
90	III	NA	NA	NA	NA	NA	NA	IV	NA	NA	X	NA	NA	NA	NA
96	III	NA	NA	NA	NA	NA	NA	IV	NA	NA	X	NA	NA	NA	NA
102	III	NA	NA	NA	NA	NA	NA	IV	NA	NA	X	NA	NA	NA	NA
108	1360	NA	NA	NA	NA	NA	NA	1680	NA	NA	NA	NA	NA	NA	NA
RCCP	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe														
CSP	Concrete Sewer, Storm drain, and Culvert Pipe														
PVC	Polyvinyl Chloride Pipe														
CPVC	Corrugated Polyvinyl Chloride Pipe														
ESCP	Extra Strength Clay Pipe														
PE	Polyethylene Pipe with a Smooth Interior														
CPE	Corrugated Polyethylene Pipe with a Smooth Interior														
CPP	Corrugated Polypropylene pipe with a Smooth Interior														
X	This material may be used for the given pipe diameter and fill height.														
NA	This material is Not Acceptable for the given pipe diameter and fill height.														
*	May also use Standard Strength Clay Pipe														
Note	RCCP with a number instead of a Roman numeral shall be furnished according to AASHTO M170 Section 6. This number represents the D-load to produce a 0.01 in crack.														

**STORM SEWERS (metric)**  
**KIND OF MATERIAL PERMITTED AND STRENGTH REQUIRED**  
**FOR A GIVEN PIPE DIAMETERS AND FILL HEIGHTS OVER THE TOP OF THE PIPE**

Nominal Diameter in.	Type 3											Type 4										
	Fill Height: Greater than 3 m not exceeding 4.5 m						Fill Height: Greater than 4.5 m not exceeding 6 m					Fill Height: Greater than 4.5 m not exceeding 6 m										
	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP	RCCP	CSP	ESCP	PVC	CPVC	PE	CPP	RCCP	CSP	ESCP	PVC	CPVC	PE	CPP
250	NA	2	X	X	X	X	NA	NA	3	X	X	X	X	X	NA	NA	X	X	X	X	X	NA
300	III	2	X	X	X	NA	NA	X	NA	NA	X	X	X	X	IV	NA	NA	X	X	X	X	NA
375	III	3	X	X	X	NA	NA	X	NA	NA	X	X	X	X	IV	NA	NA	X	X	X	X	X
450	III	NA	X	X	X	NA	NA	X	NA	NA	X	X	X	X	IV	NA	NA	X	X	X	X	NA
525	III	NA	NA	X	X	NA	NA	NA	NA	NA	X	X	X	IV	NA	NA	NA	X	X	X	X	NA
600	III	NA	NA	NA	X	X	NA	NA	NA	NA	X	X	X	IV	NA	NA	NA	X	X	X	X	NA
675	III	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA
750	III	NA	NA	NA	X	X	NA	X	NA	NA	X	X	X	IV	NA	NA	X	X	X	X	X	NA
825	III	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA
900	III	NA	NA	NA	X	X	NA	X	NA	NA	X	X	X	IV	NA	NA	NA	X	X	X	X	NA
1050	III	NA	NA	NA	X	X	NA	X	NA	NA	X	X	X	IV	NA	NA	NA	X	X	X	X	NA
1200	III	NA	NA	NA	X	X	NA	X	NA	NA	X	X	X	IV	NA	NA	NA	X	X	X	X	NA
1350	III	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA
1500	III	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA
1650	III	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA
1800	III	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA
1950	III	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA
2100	III	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA
2250	III	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA	NA	NA
2400	III	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IV	80	NA	NA	NA	NA	NA	NA	NA
2550	III	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IV	80	NA	NA	NA	NA	NA	NA	NA
2700	70	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IV	80	NA	NA	NA	NA	NA	NA	NA

RCCP Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe  
CSP Concrete Sewer, Storm drain, and Culvert Pipe  
PVC Polyvinyl Chloride Pipe  
CPVC Corrugated Polyvinyl Chloride Pipe  
ESCP Extra Strength Clay Pipe  
PE Polyethylene Pipe with a Smooth Interior  
CPE Corrugated Polyethylene Pipe with a Smooth Interior  
CPP Corrugated Polypropylene pipe with a Smooth Interior  
X This material may be used for the given pipe diameter and fill height.  
NA This material is Not Acceptable for the given pipe diameter and fill height.  
\* May also use Standard Strength Clay Pipe  
Note RCCP with a number instead of a Roman numeral shall be furnished according to AASHTO M170 Section 6. This number represents the metric D-load to produce a 25.4 micro-meter crack.

**STORM SEWERS**  
**KIND OF MATERIAL PERMITTED AND STRENGTH REQUIRED**  
**FOR A GIVEN PIPE DIAMETERS AND FILL HEIGHTS OVER THE TOP OF THE PIPE**

Nominal Diameter in.	Type 5			Type 6			Type 7	
	Fill Height: Greater than 20' not exceeding 25'			Fill Height: Greater than 25' not exceeding 30'			Fill Height: Greater than 30' not exceeding 35'	
	RCCP	PVC	CPVC	RCCP	PVC	CPVC	RCCP	CPVC
10	NA	X	X	NA	X	X	NA	X
12	IV	X	X	V	X	X	V	X
15	IV	X	X	V	X	X	V	X
18	IV	X	X	V	X	X	V	X
21	IV	X	X	V	X	X	V	X
24	IV	X	X	V	X	X	V	X
27	IV	NA	NA	V	NA	NA	V	NA
30	IV	X	X	V	X	X	V	X
33	IV	NA	NA	V	NA	NA	V	NA
36	IV	X	X	V	X	X	V	X
42	IV	X	NA	V	X	NA	V	NA
48	IV	X	NA	V	X	NA	V	NA
54	IV	NA	NA	V	NA	NA	V	NA
60	IV	NA	NA	V	NA	NA	V	NA
66	IV	NA	NA	V	NA	NA	V	NA
72	V	NA	NA	V	NA	NA	V	NA
78	2020	NA	NA	2370	NA	NA	2730	NA
84	2020	NA	NA	2380	NA	NA	2740	NA
90	2030	NA	NA	2390	NA	NA	2750	NA
96	2040	NA	NA	2400	NA	NA	2750	NA
102	2050	NA	NA	2410	NA	NA	2760	NA
108	2060	NA	NA	2410	NA	NA	2770	NA

RCCP Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe  
PVC Polyvinyl Chloride Pipe  
CPVC Corrugated Polyvinyl Chloride Pipe  
ESCP Extra Strength Clay Pipe

X This material may be used for the given pipe diameter and fill height.  
NA This material is Not Acceptable for the given pipe diameter and fill height.  
Note RCCP with a number instead of a Roman numeral shall be furnished according to AASHTO M170 Section 6. This number represents the D-load to produce a 0.01 in crack.

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STORM SEWERS (metric)									
KIND OF MATERIAL PERMITTED AND STRENGTH REQUIRED FOR A GIVEN PIPE DIAMETERS AND FILL HEIGHTS OVER THE TOP OF THE PIPE									
Nominal Diameter in.	Type 5			Type 6			Type 7		
	Fill Height: Greater than 20' not exceeding 25'			Fill Height: Greater than 25' not exceeding 30'			Fill Height: Greater than 30' not exceeding 35'		
	RCCP	PVC	CPVC	RCCP	PVC	CPVC	RCCP	CPVC	CPVC
250	NA	X	X	NA	X	X	NA	X	X
300	IV	X	X	V	X	X	V	V	X
375	IV	X	X	V	X	X	V	V	X
450	IV	X	X	V	X	X	V	V	X
525	IV	X	X	V	X	X	V	V	X
600	IV	X	X	V	X	X	V	V	X
675	IV	NA	NA	V	NA	NA	V	V	NA
750	IV	X	X	V	X	X	V	V	X
825	IV	NA	NA	V	NA	NA	V	V	NA
900	IV	X	X	V	X	X	V	V	X
1050	IV	X	NA	V	X	NA	V	V	NA
1200	IV	X	NA	V	X	NA	V	V	NA
1350	IV	NA	NA	V	NA	NA	V	V	NA
1500	IV	NA	NA	V	NA	NA	V	V	NA
1650	IV	NA	NA	V	NA	NA	V	V	NA
1800	V	NA	NA	V	NA	NA	V	V	NA
1950	100	NA	NA	110	NA	NA	130	NA	NA
2100	100	NA	NA	110	NA	NA	130	NA	NA
2250	100	NA	NA	110	NA	NA	130	NA	NA
2400	100	NA	NA	120	NA	NA	130	NA	NA
2550	100	NA	NA	120	NA	NA	130	NA	NA
2700	100	NA	NA	120	NA	NA	130	NA	NA

RCCP Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe  
PVC Polyvinyl Chloride Pipe  
CPVC Corrugated Polyvinyl Chloride Pipe  
ESCP Extra Strength Clay Pipe  
X This material may be used for the given pipe diameter and fill height.  
NA This material is Not Acceptable for the given pipe diameter and fill height.  
Note RCCP with a number instead of a Roman numeral shall be furnished according to AASHTO M170 Section 6. This number represents the metric D-load to produce a 25.4 micro-meter crack.

663

Revise the sixth paragraph of Article 550.06 of the Standard Specifications to read:

“PVC, PE and CPP pipes shall be joined according to the manufacturer’s specifications.”

Revise the first and second paragraphs of Article 550.08 of the Standard Specifications to read:

“**550.08 Deflection Testing for Storm Sewers.** All PVC, PE, and CPP storm sewers shall be tested for deflection not less than 30 days after the pipe is installed and the backfill compacted. The testing shall be performed in the presence of the Engineer.

For PVC, PE, and CPP storm sewers with diameters 24 in. (600 mm) or smaller, a mandrel drag shall be used for deflection testing. For PVC, PE, and CPP storm sewers with diameters over 24 in. (600 mm), deflection measurements other than by a mandrel shall be used.”

Revise the fifth paragraph of Article 550.08 to read as follows.

“The outside diameter of the mandrel shall be 95 percent of the base inside diameter. For all PVC pipe the base inside diameter shall be defined using ASTM D 3034 methodology. For all PE and CPP pipe, the base inside diameter shall be defined as the average inside diameter based on the minimum and maximum tolerances specified in the corresponding ASTM or AASHTO material specifications.”

Revise the first paragraph of Article 1040.03 of the Standard Specifications to read:

“**1040.03 Polyvinyl Chloride (PVC) Pipe.** Acceptance testing of PVC pipe and fittings shall be accomplished during the same construction season in which they are installed. The section properties shall be according to the manufacturer pre-submitted geometric properties on file with the Department. The manufacturer shall submit written certification that the material meets those properties. The pipe shall meet the following additional requirements.”

Delete Articles 1040.03(e) and (f) of the Standard Specifications.

Revise Articles 1040.04(c) and (d) of the Standard Specifications to read:

“(c) PE Profile Wall Pipe for Insertion Lining. The pipe shall be according to ASTM F 894. When used for insertion lining of pipe culverts, the pipe liner shall have a minimum pipe stiffness of 46 psi (317 kPa) at five percent deflection for nominal inside diameters of 42 in. (1050 mm) or less. For nominal inside diameters of greater than 42 in. (1050 mm), the pipe liner shall have a minimum pipe stiffness of 32.5 psi (225 kPa) at five percent deflection. All sizes shall have wall construction that presents essentially smooth internal and external surfaces.

(d) PE Pipe with a Smooth Interior. The pipe shall be according to ASTM F 714 (DR 32.5) with a minimum cell classification of PE 335434 as defined in ASTM D 3350. The section properties shall be according to the manufacturer pre-submitted geometric properties on file with the Department. The manufacturer shall submit written

certification that the material meets those properties and the resin used to manufacture the pipe meets or exceeds the minimum cell classification requirements.”

Add the following to Section 1040 of the Standard Specifications:

**“1040.08 Polypropylene (PP) Pipe.** Storage and handling shall be according to the manufacturer’s recommendations, except in no case shall the pipe be exposed to direct sunlight for more than six months. Acceptance testing of the pipe shall be accomplished during the same construction season in which it is installed. The section properties shall be according to the manufacturer pre-submitted geometric properties on file with the Department. The manufacturer shall submit written certification that the material meets those properties. The pipe shall meet the following additional requirements.

- (a) Corrugated PP Pipe with a Smooth Interior. The pipe shall be according to AAHSTO M 330 (nominal size – 12 to 60 in. (300 to 1500 mm)). The pipe shall be Type S or D.
- (b) Perforated Corrugated PP Pipe with A Smooth Interior. The pipe shall be according to AASHTO M 330 (nominal size – 12 to 60 in. (300 to 1500 mm)). The pipe shall be Type SP. In addition, the top centerline of the pipe shall be marked so that it is readily visible from the top of the trench before backfilling, and the upper ends of the slot perforations shall be a minimum of ten degrees below the horizontal.”

80325

665

**MECHANICAL SIDE TIE BAR INSERTER (BDE)**

Effective: August 1, 2014

Add the following to Article 420.03 of the Standard Specifications:

“(k) Mechanical Side Tie Bar Inserters ..... 1103.18”

Revise Article 420.05(b) of the Standard Specifications to read:

“(b) Longitudinal Construction Joint. The tie bars shall be installed using one of the following methods.

- (1) Preformed or Drilled Holes. The tie bars shall be installed with an approved nonshrink grout or chemical adhesive providing a minimum pull-out strength as follows.

Bar Size	Minimum Pull-Out Strength
No. 6 (No. 19)	11,000 lb (49 kN)
No. 8 (No. 25)	19,750 lb (88 kN)

Holes shall be blown clean and dry prior to placing the grout or adhesive. If compressed air is used, the pneumatic tool lubricator shall be bypassed and a filter installed on the discharge valve to keep water and oil out of the lines. The installation shall be with methods and tools conforming to the grout or adhesive manufacturer’s recommendations.

The Contractor shall load test five percent of the first 500 tie bars installed. No further installation will be allowed until the initial five percent testing has been completed and approval to continue installation has been given by the Engineer. Testing will be required for 0.5 percent of the bars installed after the initial 500. For each bar that fails to pass the minimum requirements, two more bars selected by the Engineer shall be tested. Each bar that fails to meet the minimum load requirement shall be reinstalled and retested. The equipment and method used for testing shall meet the requirements of ASTM E 488. All tests shall be performed within 72 hours of installation. The tie bars shall be installed and approved before concrete is placed in the adjacent lane.”

- (2) Inserted. The tie bars shall be installed with the use of a mechanical side tie bar inserter. The tie bars shall be No. 6 (No. 19) bars, 30 inches (750 mm) long, placed mid-depth on 24 in. (600 mm) centers along the joint edge. The inserter shall insert the tie bars with vibration after the concrete has been struck off and consolidated without deformation of the slab. The inserter shall remain stationary relative to the pavement when inserting tie bars, while the formless paver continues to move in the direction of paving.

A void greater than 1/8 in. (3 mm) at any location around the tie bar shall require immediate adjustment of the paving operation. A void greater than 1/2 in.(13 mm) shall be repaired with a nonshrink grout or chemical adhesive after the concrete has hardened. If at the end of the day of paving more than 20 percent of the tie bars show a void larger than 1/8 in. (3 mm) at any point around the bar, the use of the side tie bar inserter shall be discontinued.

(3) Formed in Place. The tie bar shall be formed in place as shown on the plans.

The sealant reservoir shall be formed either by sawing after the concrete has set according to Article 420.05(a) or by hand tools when the concrete is in a plastic state.”

Add the following to Section 1103 of the Standard Specifications:

“**1103.18 Mechanical Side Bar Inserters.** The mechanical side tie bar inserter shall be self-contained and supported on the formless paver with the ability to move independently from the formless paver. The insertion apparatus shall vibrate within a frequency of 2000 to 6000 vpm. A vibrating reed tachometer, hand type, shall be provided according to Article 1103.12.”

80342

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## **PAYROLLS AND PAYROLL RECORDS (BDE)**

Effective: January 1, 2014

FEDERAL AID CONTRACTS. Revise the following section of Check Sheet #1 of the Recurring Special Provisions to read:

### **"STATEMENTS AND PAYROLLS**

The payroll records shall include the worker's name, the worker's address, the worker's telephone number when available, the worker's social security number, the worker's classification or classifications, the worker's gross and net wages paid in each pay period, the worker's number of hours worked each day, the worker's starting and ending times of work each day. However, any Contractor or subcontractor who remits contributions to a fringe benefit fund that is not jointly maintained and jointly governed by one or more employers and one or more labor organization must additionally submit the worker's hourly wage rate, the worker's hourly overtime wage rate, the worker's hourly fringe benefit rates, the name and address of each fringe benefit fund, the plan sponsor of each fringe benefit, if applicable, and the plan administrator of each fringe benefit, if applicable.

The Contractor and each subcontractor shall submit payroll records to the Engineer each week from the start to the completion of their respective work, except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead, the payrolls shall include an identification number for each employee (e.g., the last four digits of the employee's social security number). In addition, starting and ending times of work each day may be omitted from the payroll records submitted to the Engineer. The submittals shall be on the Department's form SBE 48, or an approved facsimile. When there has been no activity during a work week, a payroll record shall still be submitted with the appropriate box ("No Work", "Suspended", or "Complete") checked on the form."

STATE CONTRACTS. Revise Section IV of Check Sheet #5 of the Recurring Special Provisions to read:

### **"IV. COMPLIANCE WITH THE PREVAILING WAGE ACT**

1. **Prevailing Wages.** All wages paid by the Contractor and each subcontractor shall be in compliance with The Prevailing Wage Act (820 ILCS 130), as amended, except where a prevailing wage violates a federal law, order, or ruling, the rate conforming to the federal law, order, or ruling shall govern. The Contractor shall be responsible to notify each subcontractor of the wage rates set forth in this contract and any revisions thereto. If the Department of Labor revises the wage rates, the Contractor will not be allowed additional compensation on account of said revisions.
2. **Payroll Records.** The Contractor and each subcontractor shall make and keep, for a period of five years from the later of the date of final payment under the contract or completion of the contract, records of the wages paid to his/her workers. The payroll

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records shall include the worker's name, the worker's address, the worker's telephone number when available, the worker's social security number, the worker's classification or classifications, the worker's gross and net wages paid in each pay period, the worker's number of hours worked each day, the worker's starting and ending times of work each day. However, any contractor or subcontractor who remits contributions to a fringe benefit fund that is not jointly maintained and jointly governed by one or more employers and one or more labor organization must additionally submit the worker's hourly wage rate, the worker's hourly overtime wage rate, the worker's hourly fringe benefit rates, the name and address of each fringe benefit fund, the plan sponsor of each fringe benefit, if applicable, and the plan administrator of each fringe benefit, if applicable. Upon seven business days' notice, these records shall be available at a location within the State, during reasonable hours, for inspection by the Department or the Department of Labor; and Federal, State, or local law enforcement agencies and prosecutors.

3. Submission of Payroll Records. The Contractor and each subcontractor shall submit payroll records to the Engineer each week from the start to the completion of their respective work, except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall include an identification number for each employee (e.g., the last four digits of the employee's social security number). In addition, starting and ending times of work each day may be omitted from the payroll records submitted to the Engineer. The submittals shall be on the Department's form SBE 48, or an approved facsimile. When there has been no activity during a work week, a payroll record shall still be submitted with the appropriate box ("No Work", "Suspended", or "Complete") checked on the form.

Each submittal shall be accompanied by a statement signed by the Contractor or subcontractor, or an officer, employee, or officer thereof, which avers that: (i) he or she has examined the records and such records are true and accurate; (ii) the hourly rate paid to each worker is not less than the general prevailing rate of hourly wages required by the Act; and (iii) the Contractor or subcontractor is aware that filing a payroll record that he/she knows to be false is a Class A misdemeanor.

4. Employee Interviews. The Contractor and each subcontractor shall permit his/her employees to be interviewed on the job, during working hours, by compliance investigators of the Department or the Department of Labor."

**PORTLAND CEMENT CONCRETE EQUIPMENT (BDE)**

Effective: November 1, 2013

Add the following to the first paragraph of Article 1103.03(a)(5) of the Standard Specifications to read:

“As an alternative to a locking key, the start and finish time for mixing may be automatically printed on the batch ticket. The start and finish time shall be reported to the nearest second.”

80326

## **PRECAST CONCRETE HANDHOLE (BDE)**

Effective: August 1, 2014

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

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

Add the following to Article 814.03 of the Standard Specifications:

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

Add the following to Section 1042 of the Standard Specifications:

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

80343

## **PROGRESS PAYMENTS (BDE)**

Effective: November 2, 2013

Revise Article 109.07(a) of the Standard Specifications to read:

“(a) Progress Payments. At least once each month, the Engineer will make a written estimate of the quantity of work performed in accordance with the contract, and the value thereof at the contract unit prices. The amount of the estimate approved as due for payment will be vouchered by the Department and presented to the State Comptroller for payment. No amount less than \$1000.00 will be approved for payment other than the final payment.

Progress payments may be reduced by liens filed pursuant to Section 23(c) of the Mechanics' Lien Act, 770 ILCS 60/23(c).

If a Contractor or subcontractor has defaulted on a loan issued under the Department's Disadvantaged Business Revolving Loan Program (20 ILCS 2705/2705-610), progress payments may be reduced pursuant to the terms of that loan agreement. In such cases, the amount of the estimate related to the work performed by the Contractor or subcontractor, in default of the loan agreement, will be offset, in whole or in part, and vouchered by the Department to the Working Capital Revolving Fund or designated escrow account. Payment for the work shall be considered as issued and received by the Contractor or subcontractor on the date of the offset voucher. Further, the amount of the offset voucher shall be a credit against the Department's obligation to pay the Contractor, the Contractor's obligation to pay the subcontractor, and the Contractor's or subcontractor's total loan indebtedness to the Department. The offset shall continue until such time as the entire loan indebtedness is satisfied. The Department will notify the Contractor and Fund Control Agent in a timely manner of such offset. The Contractor or subcontractor shall not be entitled to additional payment in consideration of the offset.

The failure to perform any requirement, obligation, or term of the contract by the Contractor shall be reason for withholding any progress payments until the Department determines that compliance has been achieved.”

80328

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## QUALITY CONTROL/QUALITY ASSURANCE OF CONCRETE MIXTURES (BDE)

Effective: January 1, 2012

Revised: January 1, 2014

Revise Note 7/ of Schedule B of Recurring Special Provision Check Sheet #31 of the Standard Specifications to read:

- 7/ The test of record for strength shall be the day indicated in Article 1020.04. For cement aggregate mixture II, a strength requirement is not specified and testing is not required. Additional strength testing to determine early falsework and form removal, early pavement or bridge opening to traffic, or to monitor strengths is at the discretion of the Contractor. Strength shall be defined as the average of two 6 x 12 in. (150 x 300 mm) cylinder breaks, three 4 x 8 in. (100 x 200 mm) cylinder breaks, or two beam breaks for field tests. Per Illinois Modified AASHTO T 23, cylinders shall be 6 x 12 in. (150 x 300 mm) when the nominal maximum size of the coarse aggregate exceeds 1 in. (25 mm).

80281



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 Engineer evidence that the required insurance has been approved by the railroad(s). The Contractor shall also provide the Engineer with the expiration date of each required policy.

Basis of Payment. Providing Railroad Protective Liability and Property Damage Liability Insurance will be paid for at the contract unit price per Lump Sum for RAILROAD PROTECTIVE LIABILITY INSURANCE.

80157

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## REINFORCEMENT BARS (BDE)

Effective: November 1, 2013

Revise the first and second paragraphs of Article 508.05 of the Standard Specifications to read:

**508.05 Placing and Securing.** All reinforcement bars shall be placed and tied securely at the locations and in the configuration shown on the plans prior to the placement of concrete. Manual welding of reinforcement may only be permitted on precast concrete products as indicated in the current Bureau of Materials and Physical Research Policy Memorandum "Quality Control / Quality Assurance Program for Precast Concrete Products", and for precast prestressed concrete products as indicated in the Department's current "Manual for Fabrication of Precast Prestressed Concrete Products". Reinforcement bars shall not be placed by sticking or floating into place or immediately after placement of the concrete.

Bars shall be tied at all intersections, except where the center to center dimension is less than 1 ft (300 mm) in each direction, in which case alternate intersections shall be tied. Molded plastic clips may be used in lieu of wire to secure bar intersections, but shall not be permitted in horizontal bar mats subject to construction foot traffic or to secure longitudinal bar laps. Plastic clips shall adequately secure the reinforcement bars, and shall permit the concrete to flow through and fully encase the reinforcement. Plastic clips may be recycled plastic, and shall meet the approval of the Engineer. The number of ties as specified shall be doubled for lap splices at the stage construction line of concrete bridge decks when traffic is allowed on the first completed stage during the pouring of the second stage."

Revise the fifth paragraph of Article 508.05 of the Standard Specifications to read:

"Supports for reinforcement in bridge decks shall be metal. For all other concrete construction the supports shall be metal or plastic. Metal bar supports shall be made of cold-drawn wire, or other approved material and shall be either epoxy coated, galvanized or plastic tipped. When the reinforcement bars are epoxy coated, the metal supports shall be epoxy coated. Plastic supports may be recycled plastic. Supports shall be provided in sufficient number and spaced to provide the required clearances. Supports shall adequately support the reinforcement bars, and shall permit the concrete to flow through and fully encase the reinforcement. The legs of supports shall be spaced to allow an opening that is a minimum 1.33 times the nominal maximum aggregate size used in the concrete. Nominal maximum aggregate size is defined as the largest sieve which retains any of the aggregate sample particles. All supports shall meet the approval of the Engineer."

Revise the first sentence of the eighth paragraph of Article 508.05 of the Standard Specifications to read:

"Epoxy coated reinforcement bars shall be tied with plastic coated wire, epoxy coated wire, or molded plastic clips where allowed."

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Add the following sentence to the end of the first paragraph of Article 508.06(c) of the Standard Specifications:

“In addition, the total slip of the bars within the splice sleeve of the connector after loading in tension to 30 ksi (207 MPa) and relaxing to 3 ksi (20.7 MPa) shall not exceed 0.01 in. (254 microns).”

Revise Article 1042.03(d) of the Standard Specifications to read:

“(d) Reinforcement and Accessories: The concrete cover over all reinforcement shall be within  $\pm 1/4$  in. ( $\pm 6$  mm) of the specified cover.

Welded wire fabric shall be accurately bent and tied in place.

Miscellaneous accessories to be cast into the concrete or for forming holes and recesses shall be carefully located and rigidly held in place by bolts, clamps, or other effective means. If paper tubes are used for vertical dowel holes, or other vertical holes which require grouting, they shall be removed before transportation to the construction site.”

80327

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## REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES (BDE)

Effective: January 1, 2012

Revised: November 2, 2012

Revise Article 669.01 of the Standard Specifications to read:

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

Revise Article 669.08 of the Standard Specifications to read:

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

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

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

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

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

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

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

- (4) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as "uncontaminated soil" at a CCDD facility or an uncontaminated soil fill operation within an MSA County excluding Chicago provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
- (5) When the Engineer determines soil cannot be managed according to Articles 669.09(a)(1) through (a)(4) above, the soil shall be managed and disposed of off-site as a non-special waste, special waste, or hazardous waste as applicable.
- (b) Soil Analytical Results Do Not Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels do not exceed the most stringent MAC but the pH of the soil is less than 6.25 or greater than 9.0, the excavated soil can be utilized within the construction limits or managed and disposed of off-site as "uncontaminated soil" according to Article 202.03. However the excavated soil cannot be taken to a CCDD facility or an uncontaminated soil fill operation.
- (c) Groundwater. When groundwater analytical results indicate the detected levels are above Appendix B, Table E of 35 Illinois Administrative Code 742, the most stringent Tier 1 Groundwater Remediation Objectives for Groundwater Component of the Groundwater Ingestion Route for Class 1 groundwater, the groundwater shall be managed off-site as a special waste.

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

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

Revise Article 669.14 of the Standard Specifications to read:

**"669.14 Final Environmental Construction Report.** At the end of the project, the Contractor will prepare and submit three copies of the Environmental Construction Report on the activities conducted during the life of the project, one copy shall be submitted to the Resident Engineer, one copy shall be submitted to the District's Environmental Studies Unit, and one copy shall be submitted with an electronic copy in Adode.pdf format to the Geologic

and Waste Assessment Unit, Bureau of Design and Environment, IDOT, 2300 South Dirksen Parkway, Springfield, Illinois 62764. The technical report shall include all pertinent information regarding the project including, but not limited to:

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

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

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

80283

## REMOVAL AND DISPOSAL OF SURPLUS MATERIALS (BDE)

Effective: November 2, 2012

Revise the first four paragraphs of Article 202.03 of the Standard Specifications to read:

**"202.03 Removal and Disposal of Surplus, Unstable, Unsuitable, and Organic Materials.** Suitable excavated materials shall not be wasted without permission of the Engineer. The Contractor shall dispose of all surplus, unstable, unsuitable, and organic materials, in such a manner that public or private property will not be damaged or endangered.

Suitable earth, stones and boulders naturally occurring within the right-of-way may be placed in fills or embankments in lifts and compacted according to Section 205. Broken concrete without protruding metal bars, bricks, rock, stone, reclaimed asphalt pavement with no expansive aggregate, or uncontaminated dirt and sand generated from construction or demolition activities may be used in embankment or in fill. If used in fills or embankments, these materials shall be placed and compacted to the satisfaction of the Engineer; shall be buried under a minimum of 2 ft (600 mm) of earth cover (except when the materials include only uncontaminated dirt); and shall not create an unsightly appearance or detract from the natural topographic features of an area. Broken concrete without protruding metal bars, bricks, rock, or stone may be used as riprap as approved by the Engineer. If the materials are used for fill in locations within the right-of-way but outside project construction limits, the Contractor must specify to the Engineer, in writing, how the landscape restoration of the fill areas will be accomplished. Placement of fill in such areas shall not commence until the Contractor's landscape restoration plan is approved by the Engineer.

Aside from the materials listed above, all other construction and demolition debris or waste shall be disposed of in a licensed landfill, recycled, reused, or otherwise disposed of as allowed by State or Federal laws and regulations. When the Contractor chooses to dispose of uncontaminated soil at a clean construction and demolition debris (CCDD) facility or at an uncontaminated soil fill operation, it shall be the Contractor's responsibility to have the pH of the material tested to ensure the value is between 6.25 and 9.0, inclusive. A copy of the pH test results shall be provided to the Engineer.

A permit shall be obtained from IEPA and made available to the Engineer prior to open burning of organic materials (i.e., plant refuse resulting from pruning or removal of trees or shrubs) or other construction or demolition debris. Organic materials originating within the right-of-way limits may be chipped or shredded and placed as mulch around landscape plantings within the right-of-way when approved by the Engineer. Chipped or shredded material to be placed as mulch shall not exceed a depth of 6 in. (150 mm)."

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**TRAINING SPECIAL PROVISIONS (BDE)** This Training Special Provision supersedes Section 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities," and is in implementation of 23 U.S.C. 140(a).

As part of the contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The contractor shall provide on-the-job training aimed at developing full journeyman in the type of trade or job classification involved. The number of trainees to be trained under this contract will be **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.

20338

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## WARM MIX ASPHALT (BDE)

Effective: January 1, 2012

Revised: November 1, 2014

Description. This work shall consist of designing, producing and constructing Warm Mix Asphalt (WMA) in lieu of Hot Mix Asphalt (HMA) at the Contractor's option. Work shall be according to Sections 406, 407, 408, 1030, and 1102 of the Standard Specifications, except as modified herein. In addition, any references to HMA in the Standard Specifications, or the special provisions shall be construed to include WMA.

WMA is an asphalt mixture which can be produced at temperatures lower than allowed for HMA utilizing approved WMA technologies. WMA technologies are defined as the use of additives or processes which allow a reduction in the temperatures at which HMA mixes are produced and placed. WMA is produced by the use of additives, a water foaming process, or combination of both. Additives include minerals, chemicals or organics incorporated into the asphalt binder stream in a dedicated delivery system. The process of foaming injects water into the asphalt binder stream, just prior to incorporation of the asphalt binder with the aggregate.

Approved WMA technologies may also be used in HMA provided all the requirements specified herein, with the exception of temperature, are met. However, asphalt mixtures produced at temperatures in excess of 275 °F (135 °C) will not be considered WMA when determining the grade reduction of the virgin asphalt binder grade.

### Equipment.

Revise the first paragraph of Article 1102.01 of the Standard Specifications to read:

**"1102.01 Hot-Mix Asphalt Plant.** The hot-mix asphalt (HMA) plant shall be the batch-type, continuous-type, or dryer drum plant. The plants shall be evaluated for prequalification rating and approval to produce HMA according to the current Bureau of Materials and Physical Research Policy Memorandum, "Approval of Hot-Mix Asphalt Plants and Equipment". Once approved, the Contractor shall notify the Bureau of Materials and Physical Research to obtain approval of all plant modifications. The plants shall not be used to produce mixtures concurrently for more than one project or for private work unless permission is granted in writing by the Engineer. The plant units shall be so designed, coordinated and operated that they will function properly and produce HMA having uniform temperatures and compositions within the tolerances specified. The plant units shall meet the following requirements."

Add the following to Article 1102.01(a) of the Standard Specifications.

"(13) Equipment for Warm Mix Technologies.

- a. Foaming. Metering equipment for foamed asphalt shall have an accuracy of  $\pm 2$  percent of the actual water metered. The foaming control system shall be electronically interfaced with the asphalt binder meter.

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- b. Additives. Additives shall be introduced into the plant according to the supplier's recommendations and shall be approved by the Engineer. The system for introducing the WMA additive shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes."

Mix Design Verification.

Add the following to Article 1030.04 of the Standard Specifications.

"(e) Warm Mix Technologies.

- (1) Foaming. WMA mix design verification will not be required when foaming technology is used alone (without WMA additives). However, the foaming technology shall only be used on HMA designs previously approved by the Department.
- (2) Additives. WMA mix designs utilizing additives shall be submitted to the Engineer for mix design verification."

Construction Requirements.

Revise the second paragraph of Article 406.06(b)(1) of the Standard Specifications to read:

"The HMA shall be delivered at a temperature of 250 to 350 °F (120 to 175 °C).  
WMA shall be delivered at a minimum temperature of 215 °F (102 °C)."

Basis of Payment.

This work will be paid at the contract unit price bid for the HMA pay items involved. Anti-strip will not be paid for separately, but shall be considered as included in the cost of the work.

80288

## **WEEKLY DBE TRUCKING REPORTS (BDE)**

Effective: June 2, 2012

The Contractor shall provide a weekly report of Disadvantaged Business Enterprise (DBE) trucks hired by the Contractor or subcontractors (i.e. not owned by the Contractor or subcontractors) that are used on the jobsite; or used for the delivery and/or removal of equipment/material to and from the jobsite. The jobsite shall also include offsite locations, such as plant sites or storage sites, when those locations are used solely for this contract.

The report shall be submitted on the form provided by the Department within ten business days following the reporting period. The reporting period shall be Monday through Sunday for each week reportable trucking activities occur. The report shall be submitted to the Engineer and a copy shall be provided to the district EEO Officer.

Any costs associated with providing weekly DBE trucking reports shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

80302

## REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

### ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

#### I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

#### II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

**1. Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

**2. EEO Officer:** The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

**3. Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

**4. Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

**5. Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If

the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

## **6. Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

**7. Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

**8. Reasonable Accommodation for Applicants / Employees with Disabilities:** The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

**9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

#### **10. Assurance Required by 49 CFR 26.13(b):**

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

**11. Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

### **III. NONSEGREGATED FACILITIES**

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color,

religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

### **IV. Davis-Bacon and Related Act Provisions**

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

#### **1. Minimum wages**

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:



(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

## 2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such

action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

## 3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee ( e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### 4. Apprentices and trainees

##### a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

##### b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

##### d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

**5. Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

**6. Subcontracts.** The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

**7. Contract termination: debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for

debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

**8. Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

**9. Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

#### **10. Certification of eligibility.**

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

#### **V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT**

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

**1. Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

**2. Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

**3. Withholding for unpaid wages and liquidated damages.** The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such

contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

**4. Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

#### **VI. SUBLETTING OR ASSIGNING THE CONTRACT**

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

## **VII. SAFETY: ACCIDENT PREVENTION**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

## **VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

## **IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

## **X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

### **1. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded,"

as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

\* \* \* \* \*

## **2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:**

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with

commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

### **2. Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the

certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

\* \* \* \* \*

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

\* \* \* \* \*

**XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**MINIMUM WAGES FOR FEDERAL AND FEDERALLY  
ASSISTED CONSTRUCTION CONTRACTS**

This project is funded, in part, with Federal-aid funds and, as such, is subject to the provisions of the Davis-Bacon Act of March 3, 1931, as amended (46 Sta. 1494, as amended, 40 U.S.C. 276a) and of other Federal statutes referred to in a 29 CFR Part 1, Appendix A, as well as such additional statutes as may from time to time be enacted containing provisions for the payment of wages determined to be prevailing by the Secretary of Labor in accordance with the Davis-Bacon Act and pursuant to the provisions of 29 CFR Part 1. The prevailing rates and fringe benefits shown in the General Wage Determination Decisions issued by the U.S. Department of Labor shall, in accordance with the provisions of the foregoing statutes, constitute the minimum wages payable on Federal and federally assisted construction projects to laborers and mechanics of the specified classes engaged on contract work of the character and in the localities described therein.

General Wage Determination Decisions, modifications and supersedes decisions thereto are to be used in accordance with the provisions of 29 CFR Parts 1 and 5. Accordingly, the applicable decision, together with any modifications issued, must be made a part of every contract for performance of the described work within the geographic area indicated as required by an applicable DBRA Federal prevailing wage law and 29 CFR Part 5. The wage rates and fringe benefits contained in the General Wage Determination Decision shall be the minimum paid by contractors and subcontractors to laborers and mechanics.