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@illlinois.gov

Technical questions about downloading these files may be directed to Tim Garman at (217)524-1642 or 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 I**llinois 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

62

Proposal Submitted By
Name
Address
City

Letting January 30, 2015

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. 72B58
PIKE-MORGAN Counties
Section 109RS-6,123RS-3,123B-2,ETC
Route FAP 745
Project ACNHPP-ACF-0745(305)
District 6 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

(Printed by authority of the State of Illinois)

Page intentionally left blank

RETURN WITH BID

Illinois Department of Transportation

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. 72B58
   PIKE-MORGAN Counties
   Section 109RS-6,123RS-3,123B-2,ETC
   Project ACNHPP-ACF-0745(305)
   Route FAP 745
   District 6 Construction Funds

   This project consists of the construction of a new structure (SN 069-0016) to carry IL 104 over the Illinois River, building removal, earthwork, construction of a pump station, HMA paving and construction of other bridge substructures and superstructures.

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.

3. **ASSURANCE OF EXAMINATION AND INSPECTION/WAIVER.** The undersigned bidder further declares that he/she has carefully examined the proposal, plans, specifications, addenda form of contract and contract bond, and special provisions, and that he/she has inspected in detail the site of the proposed work, and that he/she has familiarized themselves with all of the local conditions affecting the contract and the detailed requirements of construction, and understands that in making this bid proposal he/she waives all right to plead any misunderstanding regarding the same.

4. **EXECUTION OF CONTRACT AND CONTRACT BOND.** The undersigned bidder further agrees to execute a contract for this work and present the same to the department within fifteen (15) days after the contract has been mailed to him/her. The undersigned further agrees that he/she and his/her surety will execute and present within fifteen (15) days after the contract has been mailed to him/her contract bond satisfactory to and in the form prescribed by the Department of Transportation, in the penal sum of the full amount of the contract, or as specified in the special provisions, guaranteeing the faithful performance of the work in accordance with the terms of the contract.

5. **PROPOSAL GUARANTY.** Accompanying this proposal is either a bid bond on the department form, executed by a corporate surety company satisfactory to the department, or a proposal guaranty check consisting of a bank cashier's check or a properly certified check for not less than 5 per cent of the amount bid or for the amount specified in the following schedule:

Amount of Bid			Proposal Guaranty	Amount of Bid			Proposal Guaranty
Up to		$5,000	$150	$2,000,000	to	$3,000,000	$100,000
$5,000	to	$10,000	$300	$3,000,000	to	$5,000,000	$150,000
$10,000	to	$50,000	$1,000	$5,000,000	to	$7,500,000	$250,000
$50,000	to	$100,000	$3,000	$7,500,000	to	$10,000,000	$400,000
$100,000	to	$150,000	$5,000	$10,000,000	to	$15,000,000	$500,000
$150,000	to	$250,000	$7,500	$15,000,000	to	$20,000,000	$600,000
$250,000	to	$500,000	$12,500	$20,000,000	to	$25,000,000	$700,000
$500,000	to	$1,000,000	$25,000	$25,000,000	to	$30,000,000	$800,000
$1,000,000	to	$1,500,000	$50,000	$30,000,000	to	$35,000,000	$900,000
$1,500,000	to	$2,000,000	$75,000	over		$35,000,000	$1,000,000

Bank cashier's checks or properly certified checks accompanying bid proposals will be made payable to the Treasurer, State of Illinois.

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

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

Attach Cashier's Check or Certified Check Here

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

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

Item _____

Section No. _____

County _____

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

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 transact business or conduct affairs 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)

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
XX005688	SS DIP CL 52 8	FOOT	88.000				
XX005691	SS DIP CL 52 18	FOOT	264.000				
X0300864	MAINT OF NAVIGATION	L SUM	1.000				
X0301847	WATER TRANSPORT- ENGR	CAL MO	48.000				
X0322936	REMOV EX FLAR END SEC	EACH	3.000				
X0322938	TEMPORARY END SECTION	EACH	4.000				
X0323716	ACCESS GATE DOUBLE 30	EACH	2.000				
X0324044	EROS CON TEMP P SL DR	EACH	12.000				
X0326654	ORNAM LIGHT UNIT COMP	EACH	18.000				
X0326694	PLUG EX STORM SEWERS	CU YD	4.000				
X0326911	TRANSVERSE DRAINS COM	EACH	9.000				
X0327000	TEMP CONN EX STRM SEW	EACH	1.000				
X0327357	CONSTRN VBRN MONITRNG	L SUM	1.000				
X0327776	LT P A 20MH 4DA	EACH	4.000				
X0327778	HANGER ASSEMBLY ARCH	L SUM	1.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
X0327779	GAS UTILITY SERV CONN	L SUM	1.000				
X0327781	TEMPORARY BERM	CU YD	1,500.000				
X0327783	REMOVAL OF TEMP BERM	CU YD	1,500.000				
X0327788	C I PIPE AT TO STR 10	FOOT	30.000				
X0327792	HLMR BRNG FIXED 2600K	EACH	2.000				
X0327794	HLMR BRG GUID EX 2600	EACH	2.000				
X0327796	BRACED EXCAVATION SPL	CU YD	463.000				
X0327798	UNDERGRD STOR CHAMBER	EACH	1.000				
X0335700	P.S. GENERAL WORK	L SUM	1.000				
X0426200	DEWATERING	L SUM	1.000				
X0783300	P.S. ELECTRICAL WORK	L SUM	1.000				
X0783500	P.S. MECHANICAL WORK	L SUM	1.000				
X2010400	STUMP REMOVAL ONLY	UNIT	130.000				
X2010505	CLEARING SPECIAL	L SUM	1.000				
X2503000	MAINTENANCE MOWING	ACRE	316.250				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
X3550015	HMA BASE CSE VAR DP	TON	9,388.000				
X4021000	TEMP ACCESS- PRIV ENT	EACH	15.000				
X4022000	TEMP ACCESS- COM ENT	EACH	30.000				
X4023000	TEMP ACCESS- ROAD	EACH	7.000				
X4240420	PC CONC SIDEWALK 4 SP	SQ FT	3,342.000				
X4401198	HMA SURF REM VAR DP	SQ YD	137,425.000				
X4403800	MEDIAN SURF REMOVAL	SQ FT	17,726.000				
X5210090	HLMR BRG GUID EXP 100	EACH	12.000				
X5210110	HLMR BRG GUID EXP 200	EACH	24.000				
X5210170	HLMR BRG GUID EXP 500	EACH	12.000				
X5210190	HLMR BRG GUID EXP 600	EACH	6.000				
X5210340	HLMR BRNG FIXED 500K	EACH	12.000				
X5210350	HLMR BRNG FIXED 600K	EACH	12.000				
X5420618	PIPE CULV CLEANED 18	FOOT	44.000				
X5420624	PIPE CULV CLEANED 24	FOOT	70.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
X5420630	PIPE CULV CLEANED 30	FOOT	406.000				
X5860110	GRANULAR BACKFILL STR	CU YD	317.300				
X6020074	INLETS TA T3V F&G	EACH	13.000				
X6020075	INLETS TB T3V F&G	EACH	18.000				
X6026051	SAN MAN RECONST	EACH	5.000				
X6100230	TF INLT BX 610001 SPL	EACH	2.000				
X6670105	PERM SURV MKRS SPL	EACH	1.000				
X6700410	ENGR FLD OFF A SPL	CAL MO	48.000				
X7240300	SIGN REMOVAL	EACH	2.000				
X8110454	CON AT ST 1 SS	FOOT	20.000				
X8110458	CON AT ST 2 SS	FOOT	50.000				
X8250500	LIGHTING UNIT COMP SP	EACH	7.000				
Z0001850	ARC PREC CON PANEL	EACH	4.000				
Z0004530	HMA DRIVEWAY PAVT 8	SQ YD	2,083.000				
Z0004542	HMA REMOVAL SPL	SQ YD	984.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
Z0004552	APPROACH SLAB REM	SQ YD	263.300				
Z0005305	BOX CUL TO BE CLEANED	FOOT	458.000				
Z0007601	BLDG REMOV NO 1	L SUM	1.000				
Z0007602	BLDG REMOV NO 2	L SUM	1.000				
Z0007603	BLDG REMOV NO 3	L SUM	1.000				
Z0007604	BLDG REMOV NO 4	L SUM	1.000				
Z0007605	BLDG REMOV NO 5	L SUM	1.000				
Z0007606	BLDG REMOV NO 6	L SUM	1.000				
Z0007607	BLDG REMOV NO 7	L SUM	1.000				
Z0007608	BLDG REMOV NO 8	L SUM	1.000				
Z0007609	BLDG REMOV NO 9	L SUM	1.000				
Z0007610	BLDG REMOV NO 10	L SUM	1.000				
Z0007611	BLDG REMOV NO 11	L SUM	1.000				
Z0007612	BLDG REMOV NO 12	L SUM	1.000				
Z0007613	BLDG REMOV NO 13	L SUM	1.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
Z0007614	BLDG REMOV NO 14	L SUM	1.000				
Z0007615	BLDG REMOV NO 15	L SUM	1.000				
Z0007616	BLDG REMOV NO 16	L SUM	1.000				
Z0007617	BLDG REMOV NO 17	L SUM	1.000				
Z0007618	BLDG REMOV NO 18	L SUM	1.000				
Z0009100	C I PIPE 10	FOOT	79.000				
Z0013300	CONC REM SPEC	SQ YD	854.000				
Z0013798	CONSTRUCTION LAYOUT	L SUM	1.000				
Z0015500	DEBRIS REMOVAL	L SUM	1.000				
Z0016200	DECK SLAB REP (PART)	SQ YD	15.300				
Z0016702	DETOUR SIGNING	L SUM	1.000				
Z0018004	DRAINAGE SCUPPR DS-12	EACH	12.000				
Z0018800	DRAINAGE SYSTEM	L SUM	1.000				
Z0019500	DRYWELL	EACH	24.000				
Z0022800	FENCE REMOVAL	FOOT	618.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
Z0026407	TEMP SHT PILING	SQ FT	1,721.000				
Z0029090	DIAMOND GRIND BR SEC	SQ YD	9,698.000				
Z0030850	TEMP INFO SIGNING	SQ FT	32.000				
Z0034105	MATL TRANSFER DEVICE	TON	8,823.000				
Z0034210	MECH ST EARTH RET WL	SQ FT	23,481.000				
Z0034390	MODULAR EXPAN JT 6	FOOT	88.000				
Z0034393	MODULAR EXPAN JT 9	FOOT	44.000				
Z0034500	MODULAR EXPAN JT 18	FOOT	44.000				
Z0041500	PLUG EX CULVERTS	EACH	3.000				
Z0046304	P UNDR FOR STRUCT 4	FOOT	204.000				
Z0049799	PROT RESET SURVEY MRK	EACH	4.000				
Z0049807	R&D FRIABL ASB BLD 7	L SUM	1.000				
Z0049814	R&D FRIABL ASB BLD 14	L SUM	1.000				
Z0049817	R&D FRIABL ASB BLD 17	L SUM	1.000				
Z0049901	R&D NON-FR ASB BLD 1	L SUM	1.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
Z0049903	R&D NON-FR ASB BLD 3	L SUM	1.000				
Z0049905	R&D NON-FR ASB BLD 5	L SUM	1.000				
Z0049907	R&D NON-FR ASB BLD 7	L SUM	1.000				
Z0049911	R&D NON-FR ASB BLD 11	L SUM	1.000				
Z0049914	R&D NON-FR ASB BLD 14	L SUM	1.000				
Z0049917	R&D NON-FR ASB BLD 17	L SUM	1.000				
Z0054404	ROCK FILL - EMBANK	CU YD	5,240.000				
Z0056100	SAND DRAINAGE BLANKET	CU YD	9,556.000				
Z0056668	SS 2 WAT MN 12	FOOT	1,029.000				
Z0056669	SS 2 WAT MN 15	FOOT	372.000				
Z0056675	SS 2 WAT MN 30	FOOT	96.000				
Z0056678	SS 2 WAT MN 36	FOOT	398.000				
Z0062456	TEMP PAVEMENT	SQ YD	1,806.000				
20100110	TREE REMOV 6-15	UNIT	409.000				
20100210	TREE REMOV OVER 15	UNIT	1,033.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
20101100	TREE TRUNK PROTECTION	EACH	25.000				
20101350	TREE PRUN OVER 10	EACH	3.000				
20200100	EARTH EXCAVATION	CU YD	29,035.000				
20200600	EXC & GR EX SHOULDER	UNIT	8.000				
20201200	REM & DISP UNS MATL	CU YD	3,020.000				
20400800	FURNISHED EXCAVATION	CU YD	104,425.000				
20700220	POROUS GRAN EMBANK	CU YD	7,313.000				
20800150	TRENCH BACKFILL	CU YD	3,890.000				
21101615	TOPSOIL F & P 4	SQ YD	90,250.000				
21301052	EXPLOR TRENCH 52	FOOT	2,000.000				
25000100	SEEDING CL 1	ACRE	6.000				
25000200	SEEDING CL 2	ACRE	16.500				
25000350	SEEDING CL 7	ACRE	5.750				
25000400	NITROGEN FERT NUTR	POUND	2,544.000				
25000500	PHOSPHORUS FERT NUTR	POUND	2,544.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
25000600	POTASSIUM FERT NUTR	POUND	2,544.000				
25000700	AGR GROUND LIMESTONE	TON	57.000				
25100115	MULCH METHOD 2	ACRE	95.000				
25100127	MULCH METHOD 3A	ACRE	6.000				
28000200	EARTH EXC - EROS CONT	CU YD	170.000				
28000250	TEMP EROS CONTR SEED	POUND	7,765.000				
28000305	TEMP DITCH CHECKS	FOOT	590.000				
28000315	AGG DITCH CHECKS	TON	50.000				
28000400	PERIMETER EROS BAR	FOOT	8,997.000				
28000500	INLET & PIPE PROTECT	EACH	8.000				
28000510	INLET FILTERS	EACH	99.000				
28001000	AGGREGATE - EROS CONT	TON	16.100				
28100107	STONE RIPRAP CL A4	SQ YD	1,288.000				
28100109	STONE RIPRAP CL A5	SQ YD	106.000				
28100707	STONE DUMP RIP CL A4	SQ YD	84.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
28200200	FILTER FABRIC	SQ YD	1,394.000				
31100200	SUB GRAN MAT A	CU YD	457.000				
31100700	SUB GRAN MAT A 8	SQ YD	49,351.000				
31101200	SUB GRAN MAT B 4	SQ YD	2,615.000				
31101900	SUB GRAN MAT C	TON	627.000				
31200100	STAB SUBBASE 4	SQ YD	507.000				
35101800	AGG BASE CSE B 6	SQ YD	452.000				
35102000	AGG BASE CSE B 8	SQ YD	645.000				
35300500	PCC BSE CSE 10	SQ YD	180.000				
35501312	HMA BASE CSE 7	SQ YD	2,478.000				
35501320	HMA BASE CSE 9	SQ YD	2,412.000				
35501324	HMA BASE CSE 10	SQ YD	4,947.000				
35800100	PREPARATION OF BASE	SQ YD	899.000				
40200100	AGG SURF CSE A	TON	113.000				
40200500	AGG SURF CSE A 6	SQ YD	2,013.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
40200800	AGG SURF CSE B	TON	11.000				
40600625	LEV BIND MM N50	TON	182.000				
40600635	LEV BIND MM N70	TON	3,033.000				
40600982	HMA SURF REM BUTT JT	SQ YD	1,022.000				
40600990	TEMPORARY RAMP	SQ YD	92.000				
40603080	HMA BC IL-19.0 N50	TON	1,290.000				
40603085	HMA BC IL-19.0 N70	TON	4,355.000				
40603310	HMA SC "C" N50	TON	1,293.000				
40603315	HMA SC "C" N70	TON	9,598.000				
40701861	HMA PAVT FD 9	SQ YD	9,972.000				
40701896	HMA PAVT FD 10 3/4	SQ YD	14,656.000				
40800025	BIT MATLS PR CT	POUND	255,860.000				
40800050	INCIDENTAL HMA SURF	TON	298.000				
42000401	PCC PVT 9 JOINTED	SQ YD	510.000				
42000500	PCC PVT 10	SQ YD	178.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
42001200	PAVEMENT FABRIC	SQ YD	178.000				
42001300	PROTECTIVE COAT	SQ YD	9,875.000				
42001420	BR APPR PVT CON (PCC)	SQ YD	27.000				
42001430	BR APPR PVT CON (FLX)	SQ YD	964.000				
42300200	PCC DRIVEWAY PAVT 6	SQ YD	43.000				
42300400	PCC DRIVEWAY PAVT 8	SQ YD	689.000				
42400100	PC CONC SIDEWALK 4	SQ FT	53,387.500				
42400800	DETECTABLE WARNINGS	SQ FT	594.000				
44000100	PAVEMENT REM	SQ YD	20,942.000				
44000158	HMA SURF REM 2 1/4	SQ YD	829.000				
44000200	DRIVE PAVEMENT REM	SQ YD	3,935.000				
44000500	COMB CURB GUTTER REM	FOOT	5,620.000				
44000600	SIDEWALK REM	SQ FT	29,913.000				
44003100	MEDIAN REMOVAL	SQ FT	4,087.000				
44004250	PAVED SHLD REMOVAL	SQ YD	4,601.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
44200180	PAVT PATCH T2 15	SQ YD	1,500.000				
44200184	PAVT PATCH T3 15	SQ YD	200.000				
44201783	CL D PATCH T4 11	SQ YD	60.000				
48101600	AGGREGATE SHLDS B 8	SQ YD	3,077.000				
48102100	AGG WEDGE SHLD TYPE B	TON	2,986.000				
48203029	HMA SHOULDERS 8	SQ YD	7,713.000				
48203100	HMA SHOULDERS	TON	5,091.000				
48300400	PCC SHOULDERS 9	SQ YD	150.000				
50100300	REM EXIST STRUCT N1	EACH	1.000				
50100400	REM EXIST STRUCT N2	EACH	1.000				
50100500	REM EXIST STRUCT N3	EACH	1.000				
50101500	REM EXIST SUP-STR	EACH	1.000				
50102400	CONC REM	CU YD	90.800				
50104400	CONC HDWL REM	EACH	4.000				
50105220	PIPE CULVERT REMOV	FOOT	342.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
50157300	PROTECTIVE SHIELD	SQ YD	120.000				
50200100	STRUCTURE EXCAVATION	CU YD	3,215.000				
50200300	COFFERDAM EXCAVATION	CU YD	9,751.000				
50201121	COFFERDAM TYP 2 LOC 1	EACH	1.000				
50201122	COFFERDAM TYP 2 LOC 2	EACH	1.000				
50201123	COFFERDAM TYP 2 LOC 3	EACH	1.000				
50201124	COFFERDAM TYP 2 LOC 4	EACH	1.000				
50201125	COFFERDAM TYP 2 LOC 5	EACH	1.000				
50201126	COFFERDAM TYP 2 LOC 6	EACH	1.000				
50300225	CONC STRUCT	CU YD	8,459.200				
50300255	CONC SUP-STR	CU YD	4,557.800				
50300260	BR DECK GROOVING	SQ YD	11,796.100				
50300265	SEAL COAT CONC	CU YD	3,979.000				
50300280	CONCRETE ENCASEMENT	CU YD	22.300				
50300300	PROTECTIVE COAT	SQ YD	15,619.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
50500105	F & E STRUCT STEEL	L SUM	1.000				
50500505	STUD SHEAR CONNECTORS	EACH	36,039.000				
50800205	REINF BARS, EPOXY CTD	POUND	2,492,950.000				
50800515	BAR SPLICERS	EACH	854.000				
50800530	MECHANICAL SPLICERS	EACH	1,012.000				
50901750	PARAPET RAILING	FOOT	5,537.000				
50901760	PIPE HANDRAIL	FOOT	259.000				
51200957	FUR M S PILE 12X0.250	FOOT	134.000				
51200959	FUR M S PILE 14X0.312	FOOT	1,368.000				
51201800	FUR STL PILE HP14X73	FOOT	1,525.000				
51201900	FUR STL PILE HP14X89	FOOT	14,827.000				
51202100	FUR STL PILE HP14X117	FOOT	26,035.000				
51202305	DRIVING PILES	FOOT	43,889.000				
51203200	TEST PILE MET SHELLS	EACH	2.000				
51203800	TEST PILE ST HP14X73	EACH	2.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
51203900	TEST PILE ST HP14X89	EACH	6.000				
51204100	TEST PILE ST HP14X117	EACH	6.000				
51204650	PILE SHOES	EACH	640.000				
51500100	NAME PLATES	EACH	3.000				
52000110	PREF JT STRIP SEAL	FOOT	204.000				
52100010	ELAST BEARING ASSY T1	EACH	21.000				
52100520	ANCHOR BOLTS 1	EACH	180.000				
52100530	ANCHOR BOLTS 1 1/4	EACH	108.000				
52100560	ANCHOR BOLTS 2	EACH	40.000				
542A1057	P CUL CL A 2 12	FOOT	142.000				
542A1060	P CUL CL A 2 15	FOOT	57.000				
542A1066	P CUL CL A 2 21	FOOT	40.000				
542A1081	P CUL CL A 2 36	FOOT	181.000				
542A1093	P CUL CL A 2 48	FOOT	126.000				
542A1921	P CUL CL A 3 36	FOOT	110.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
54213657	PRC FLAR END SEC 12	EACH	8.000				
54213660	PRC FLAR END SEC 15	EACH	2.000				
54213666	PRC FLAR END SEC 21	EACH	2.000				
54213681	PRC FLAR END SEC 36	EACH	4.000				
54213693	PRC FLAR END SEC 48	EACH	2.000				
5422D012	P CUL CL D 2 12 TEMP	FOOT	6.000				
5422D018	P CUL CL D 2 18 TEMP	FOOT	17.000				
5422D036	P CUL CL D 2 36 TEMP	FOOT	210.000				
54261436	CONC ES 542001 36 1:4	EACH	2.000				
550A0340	STORM SEW CL A 2 12	FOOT	2,119.000				
550A0360	STORM SEW CL A 2 15	FOOT	441.000				
550A0380	STORM SEW CL A 2 18	FOOT	302.000				
550A0410	STORM SEW CL A 2 24	FOOT	429.000				
550A0430	STORM SEW CL A 2 30	FOOT	675.000				
550A0450	STORM SEW CL A 2 36	FOOT	754.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
55100200	STORM SEWER REM 6	FOOT	1,667.000				
55100300	STORM SEWER REM 8	FOOT	120.000				
55100400	STORM SEWER REM 10	FOOT	289.000				
55100500	STORM SEWER REM 12	FOOT	701.000				
55100900	STORM SEWER REM 18	FOOT	508.000				
55101100	STORM SEWER REM 21	FOOT	289.000				
55101200	STORM SEWER REM 24	FOOT	1,301.000				
55101400	STORM SEWER REM 30	FOOT	32.000				
58700300	CONCRETE SEALER	SQ FT	14,046.600				
59100100	GEOCOMPOSITE WALL DR	SQ YD	139.300				
59300100	CONTR LOW-STRENG MATL	CU YD	51.000				
60100060	CONC HDWL FOR P DRAIN	EACH	20.000				
60100945	PIPE DRAINS 12	FOOT	12.000				
60107600	PIPE UNDERDRAINS 4	FOOT	1,844.000				
60108100	PIPE UNDERDRAIN 4 SP	FOOT	180.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
60218300	MAN TA 4 DIA T1F OL	EACH	1.000				
60218400	MAN TA 4 DIA T1F CL	EACH	7.000				
60219000	MAN TA 4 DIA T8G	EACH	6.000				
60219570	MAN TA 4 DIA T3V F&G	EACH	4.000				
60221000	MAN TA 5 DIA T1F OL	EACH	1.000				
60221100	MAN TA 5 DIA T1F CL	EACH	7.000				
60221700	MAN TA 5 DIA T8G	EACH	5.000				
60222270	MAN TA 5 DIA T3V F&G	EACH	9.000				
60223800	MAN TA 6 DIA T1F CL	EACH	2.000				
60224129	MAN TA 7 DIA T3V F&G	EACH	1.000				
60224445	MAN TA 7 DIA T1F OL	EACH	1.000				
60224446	MAN TA 7 DIA T1F CL	EACH	2.000				
60234200	INLETS TA T1F OL	EACH	1.000				
60236200	INLETS TA T8G	EACH	3.000				
60240210	INLETS TB T1F OL	EACH	3.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
60240301	INLETS TB T8G	EACH	9.000				
60255500	MAN ADJUST	EACH	1.000				
60257900	MAN RECONST	EACH	2.000				
60300305	FR & LIDS ADJUST	EACH	50.000				
60500040	REMOV MANHOLES	EACH	10.000				
60500050	REMOV CATCH BAS	EACH	4.000				
60500060	REMOV INLETS	EACH	33.000				
60500105	FILL MANHOLES	EACH	1.000				
60600605	CONC CURB TB	FOOT	185.000				
60603800	COMB CC&G TB6.12	FOOT	636.500				
60605000	COMB CC&G TB6.24	FOOT	4,300.500				
60606200	COMB CC&G TB9.12 MOD	FOOT	612.000				
60608600	COMB CC&G TM6.06	FOOT	52.000				
60610400	COMB CC&G TM6.24	FOOT	58.500				
60618300	CONC MEDIAN SURF 4	SQ FT	4,138.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
60620000	CONC MED TSB6.24	SQ FT	90.000				
63000001	SPBGR TY A 6FT POSTS	FOOT	3,975.000				
63100085	TRAF BAR TERM T6	EACH	14.000				
63100167	TR BAR TRM T1 SPL TAN	EACH	8.000				
63200310	GUARDRAIL REMOV	FOOT	6,735.000				
63300575	R&R RAIL ELEM EX GDRL	FOOT	662.500				
63301990	REM RE-E T B TERM T1	EACH	12.000				
66400305	CH LK FENCE 6	FOOT	117.000				
66407800	CH LK GATES 6X16 DBL	EACH	1.000				
66600105	FUR ERECT ROW MARKERS	EACH	41.000				
66700205	PERM SURV MKRS T1	EACH	24.000				
66900200	NON SPL WASTE DISPOSL	CU YD	5,000.000				
66900205	SPL WASTE DISPOSAL	CU YD	5,000.000				
66900210	HAZARD WASTE DISPOSAL	CU YD	1,000.000				
66900450	SPL WASTE PLNS/REPORT	L SUM	1.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
66900530	SOIL DISPOSAL ANALY	EACH	5.000				
67000600	ENGR FIELD LAB	CAL MO	48.000				
67100100	MOBILIZATION	L SUM	1.000				
70100405	TRAF CONT-PROT 701321	EACH	1.000				
70100450	TRAF CONT-PROT 701201	L SUM	1.000				
70100460	TRAF CONT-PROT 701306	L SUM	1.000				
70100500	TRAF CONT-PROT 701326	L SUM	1.000				
70102620	TR CONT & PROT 701501	L SUM	1.000				
70102640	TR CONT & PROT 701801	L SUM	1.000				
70103815	TR CONT SURVEILLANCE	CAL DA	200.000				
70106500	TEMP BR TRAF SIGNALS	EACH	1.000				
70106800	CHANGEABLE MESSAGE SN	CAL MO	24.000				
70300100	SHORT TERM PAVT MKING	FOOT	17,506.000				
70300210	TEMP PVT MK LTR & SYM	SQ FT	78.000				
70300230	TEMP PVT MK LINE 5	FOOT	88,643.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
70300240	TEMP PVT MK LINE 6	FOOT	871.000				
70300250	TEMP PVT MK LINE 8	FOOT	206.000				
70300260	TEMP PVT MK LINE 12	FOOT	1,180.000				
70300280	TEMP PVT MK LINE 24	FOOT	76.000				
70301000	WORK ZONE PAVT MK REM	SQ FT	12,717.000				
70400100	TEMP CONC BARRIER	FOOT	2,313.000				
70400200	REL TEMP CONC BARRIER	FOOT	150.000				
70600260	IMP ATTN TEMP FRN TL3	EACH	4.000				
70600332	IMP ATTN REL FRN TL3	EACH	2.000				
72000100	SIGN PANEL T1	SQ FT	916.000				
72000200	SIGN PANEL T2	SQ FT	68.000				
72400100	REMOV SIN PAN ASSY TA	EACH	45.000				
72400200	REMOV SIN PAN ASSY TB	EACH	50.000				
72800100	TELES STL SIN SUPPORT	FOOT	1,531.000				
73000100	WOOD SIN SUPPORT	FOOT	42.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
73100100	BASE TEL STL SIN SUPP	EACH	24.000				
78000300	THPL PVT MK LINE 5	FOOT	26,627.000				
78000400	THPL PVT MK LINE 6	FOOT	1,062.000				
78000500	THPL PVT MK LINE 8	FOOT	224.000				
78000600	THPL PVT MK LINE 12	FOOT	2,836.000				
78004200	PREF PL PM TB INL L&S	SQ FT	315.000				
78004230	PREF PL PM TB INL L6	FOOT	263.000				
78004280	PREF PL PM TB INL L24	FOOT	354.000				
78009005	MOD URETH PM LINE 5	FOOT	125,464.000				
78009006	MOD URETH PM LINE 6	FOOT	1,278.000				
78009008	MOD URETH PM LINE 8	FOOT	430.000				
78009012	MOD URETH PM LINE 12	FOOT	3,162.000				
78100100	RAISED REFL PAVT MKR	EACH	802.000				
78200300	PRISMATIC CURB REFL	EACH	40.000				
78200410	GUARDRAIL MKR TYPE A	EACH	73.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
78200530	BAR WALL MKR TYPE C	EACH	79.000				
78201000	TERMINAL MARKER - DA	EACH	8.000				
78300200	RAISED REF PVT MK REM	EACH	478.000				
80400100	ELECT SERV INSTALL	EACH	3.000				
80400200	ELECT UTIL SERV CONN	L SUM	1.000				
81028320	UNDRGRD C PVC 1	FOOT	2,154.000				
81028360	UNDRGRD C PVC 2 1/2	FOOT	115.000				
81028380	UNDRGRD C PVC 3 1/2	FOOT	63.000				
81028770	UNDRGRD C CNC 3	FOOT	714.000				
81100300	CON AT ST 1 GALVS	FOOT	50.000				
81200230	CON EMB STR 2 PVC	FOOT	8,126.000				
81300220	JUN BX SS AS 6X6X4	EACH	2.000				
81300530	JUN BX SS AS 12X10X6	EACH	7.000				
81300610	JUN BX SS AS 14X12X6	EACH	1.000				
81603000	UD 2#8 #8G XLPUSE 3/4	FOOT	2,291.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
81603040	UD 2#6 #8G XLPUSE 1	FOOT	3,708.000				
81702120	EC C XLP USE 1C 8	FOOT	20,338.000				
81702130	EC C XLP USE 1C 6	FOOT	11,642.000				
82102100	LUM SV HOR MT 100W	EACH	4.000				
82102250	LUM SV HOR MT 250W	EACH	35.000				
82200605	WATWY OBS WARN LM LED	EACH	6.000				
82500300	LT CONT PM 240V 30	EACH	2.000				
82500400	LT CONT BASM 480V100D	EACH	1.000				
83002400	LT P A 40MH 10DA	EACH	15.000				
83003600	LT P A 45MH 15DA	EACH	20.000				
83600200	LIGHT POLE FDN 24D	FOOT	145.000				
83600355	LP F M 15BC 8" X 6'	EACH	20.000				
83800650	BKWY DEV COU SS SCRN	EACH	44.000				
84200500	REM LT UNIT SALV	EACH	3.000				
84200600	REM LT U NO SALV	EACH	18.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 72B58

State Job # - C-96-016-08

		Project Number	Route
County Name -	MORGAN- PIKE-	ACNHPP-ACF-0745/305/	FAP 745
Code -	137 - 149 -		FAP 310
District -	6 - 6 -		
Section Number -	109RS-6, 123RS-3, 123B-2, ETC		

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
84200804	REM POLE FDN	EACH	11.000				
84301200	REM NAV OBS WL SYSTEM	L SUM	1.000				
84500110	REMOV LIGHTING CONTR	EACH	1.000				
84500120	REMOV ELECT SERV INST	EACH	1.000				

CONTRACT NUMBER **72B58**

THIS IS THE TOTAL BID **$** _____

NOTES:

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

RETURN WITH BID

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

I. GENERAL

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

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

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

☐ 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 calendar 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.

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 provide a submission to a vendor portal or 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, not making a submission to a vendor portal, or who withholds a bid or submission to a vendor portal 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 or submission to a vendor portal 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.

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 and every vendor's submission to a vendor portal 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.

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 Section 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

Section 50-14 Environmental Protection Act violations.

The bidder or contractor or subcontractor, respectively, certifies in accordance with Section 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, 5 ILCS 385/3.

Pursuant to the Educational Loan Default Act no State agency shall contract with an individual for goods or services if that individual is in default on an educational loan.

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, 720 ILCS 5/3BE-11.

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

(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.

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 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 may 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 on the attached document.

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

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

Addtionally, Section 30-22 of the Code requires that the bidder certify that an Illinois office be maintained as the primary place of employment for persons employed for this contract.

_____**NA-FEDERAL**_____

_____

_____

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

L. 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 or any other procurement opportunity 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.

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 $50,000 and all submissions to a vendor portal 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 100 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any individual 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 individual 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 individual 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 100 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any individual 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 an individual 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 individual 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 an individual that is authorized to execute contracts for your organization. The individual signing can be, but does not have to be, the individual 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 an individual 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 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 $50,000, 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. _____
_____

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 __

(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. _____
_____

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 71/2% 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 __

(c) Elective status; the holding of elective office of the State of Illinois, the government of the United States, any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois currently or in the previous 3 years. Yes ___No __

(d) Relationship to anyone holding elective office currently or in the previous 2 years; spouse, father, mother, son, or daughter. Yes ___No __

(e) Appointive office; the holding of any appointive government office of the State of Illinois, the United State of America, or any unit of local government authorized by the Constitution of the State of Illinois or the statues 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 __

(h) Relationship to anyone who is or was a registered lobbyist in the previous 2 years; spouse, father, mother, son, or daughter. Yes ___No __

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

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

---

3. Communication Disclosure.

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

Name and address of person(s): _____

_____

_____

_____

RETURN WITH BID

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

Name of person(s): _____

Nature of disclosure: _____
_____
_____
_____

APPLICABLE STATEMENT

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

Completed by: ☐ _____ _____
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 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 all bids.

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 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 Act 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 Title 44, Illinois Administrative Code, Section 750.120. 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

Illinois Department of Transportation

Contract No. 72B58
PIKE-MORGAN Counties
Section 109RS-6,123RS-3,123B-2,ETC
Project ACNHPP-ACF-0745(305)
Route FAP 745
District 6 Construction Funds

PART I. IDENTIFICATION

Dept. of Human Rights # _____ Duration of Project: _____

Name of Bidder: _____

PART II. WORKFORCE PROJECTION

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

TABLE A

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

TABLE C

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

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

FOR DEPARTMENT USE ONLY

BC 1256 (Rev. 12/11/07)

Note: See instructions on page 2

RETURN WITH BID

Contract No. 72B58
PIKE-MORGAN Counties
Section 109RS-6,123RS-3,123B-2,ETC
Project ACNHPP-ACF-0745(305)
Route FAP 745
District 6 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 **Illinois 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.

BC-1256 (Rev. 12/11/07)

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. 72B58
PIKE-MORGAN Counties
Section 109RS-6,123RS-3,123B-2,ETC
Project ACNHPP-ACF-0745(305)
Route FAP 745
District 6 Construction Funds

PROPOSAL SIGNATURE SHEET

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

Firm Name _____

(IF AN INDIVIDUAL) Signature of Owner _____

Business Address _____

_____

Firm Name _____

By _____

(IF A CO-PARTNERSHIP) Business Address _____

_____

Name and Address of All Members of the Firm:

_____ _____

Corporate Name _____

By _____
Signature of Authorized Representative

(IF A CORPORATION)

_____
Typed or printed name and title of Authorized Representative

Attest _____
Signature

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

Corporate Name _____

By _____
Signature of Authorized Representative

(IF A JOINT VENTURE)

_____
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.

Illinois Department of Transportation

Return with Bid

Division of Highways
Annual Proposal Bid Bond

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., _____.

_____
(Company Name)

By _____
(Signature and Title)

Notary for PRINCIPAL

STATE OF _____
COUNTY OF _____

Signed and attested before me on _____ (date)

by _____
(Name of Notary Public)

(Seal)

_____
(Signature of Notary Public)

_____
(Date Commission Expires)

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

_____
(Company Name)

By _____
(Signature of Attorney-in-Fact)

Notary for SURETY

STATE OF _____
COUNTY OF _____

Signed and attested before me on _____ (date)

by _____
(Name of Notary Public)

(Seal)

_____
(Signature of Notary Public)

_____
(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.

Illinois Department of Transportation

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., _____.

_____
(Company Name)

By _____
(Signature and Title)

Notary for PRINCIPAL

STATE OF _____
COUNTY OF _____

Signed and attested before me on _____ (date)
by _____
(Name of Notary Public)

(Seal)

_____
(Signature of Notary Public)

_____
(Date Commission Expires)

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

_____
(Company Name)

By _____
(Signature of Attorney-in-Fact)

Notary for SURETY

STATE OF _____
COUNTY OF _____

Signed and attested before me on _____ (date)
by _____
(Name of Notary Public)

(Seal)

_____
(Signature of Notary Public)

_____
(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

Illinois Department of Transportation

DBE Utilization Plan

(1) Policy

It is public policy that disadvantaged 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 disadvantaged 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
2300 South Dirksen Parkway
Springfield, Illinois 62764

Local Let Projects
Submit forms to the
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.

Illinois Department of Transportation

DBE Participation Statement

Subcontractor Registration Number _____ Letting _____

Participation Statement Item No. _____

(1) Instructions Contract No. _____

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

(2) Work:

Please indicate: J/V _____ Manufacturer _____ Supplier (60%) _____ Subcontractor _____ Trucking _____

Pay Item No.	Description	Quantity	Unit Price	Total
			Total	

(3) Partial Payment Items (For any of the above items which are partial pay items)
Description must be sufficient to determine a Commercially Useful Function, specifically describe the work and subcontract dollar amount:

(4) Commitment
When a DBE is to be a second-tier subcontractor, or if the first-tier DBE subcontractor is going to be subcontracting a portion of its subcontract, it must be clearly indicated on the DBE Participation Statement, and the details of the transaction fully explained.

In the event a DBE subcontractor second-tiers a portion of its subcontract to one or more subcontractors during the work of a contract, the prime must submit a DBE Participation Statement, with the details of the transaction(s) fully explained.

The undersigned certify that the information included herein is true and correct, and that the DBE firm listed below has agreed to perform a commercially useful function in the work of the contract item(s) listed above and to execute a contract with the prime contractor or 1st Tier subcontractor. The undersigned further understand that no changes to this statement may be made without prior approval from the Department's Bureau of Small Business Enterprises and that complete and accurate information regarding actual work performed on this project and the payment therefore must be provided to the Department.

_____
Signature for Contractor __ 1st Tier __ 2nd Tier

Title _____

Date _____

Contact Person _____

Phone _____

Firm Name _____

Address _____

City/State/Zip _____

_____
Signature for DBE Firm __ 1st Tier __ 2nd Tier

Title _____

Date _____

Contact Person _____

Phone _____

Firm Name _____

Address _____

City/State/Zip _____

E _____

WC _____

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

PROPOSAL ENVELOPE

Illinois Department of Transportation

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. 72B58
PIKE-MORGAN Counties
Section 109RS-6,123RS-3,123B-2,ETC
Project ACNHPP-ACF-0745(305)
Route FAP 745
District 6 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 100 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any individual 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 individual 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 individual 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 100 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any individual 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 an individual 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 individual 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 an individual that is authorized to execute contracts for your organization. The individual signing can be, but does not have to be, the individual 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 an individual 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.

RETURN WITH SUBCONTRACT

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

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

DISCLOSURE OF FINANCIAL INFORMATION

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

FOR INDIVIDUAL (type or print information)

NAME: _____

ADDRESS _____

_____

Type of ownership/distributable income share:

stock _____ sole proprietorship _____ Partnership _____ other: (explain on separate sheet):

% or $ value of ownership/distributable income share: _____

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

(a) State employment, currently or in the previous 3 years, including contractual employment of services.
Yes ___No __

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

1. Are you currently an officer or employee of either the Capitol Development Board or the Illinois State Toll Highway Authority? Yes ___No __

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

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 71/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of of 100% of the annual salary of the Governor? Yes ___No __

4. If your spouse or any minor children are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15 % in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of two times the salary of the Governor?
Yes ___No __

(c) Elective status; the holding of elective office of the State of Illinois, the government of the United States, any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois currently or in the previous 3 years. Yes ___No __

(d) Relationship to anyone holding elective office currently or in the previous 2 years; spouse, father, mother, son, or daughter. Yes ___No __

(e) Appointive office; the holding of any appointive government office of the State of Illinois, the United States of America, or any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois, which office entitles the holder to compensation in excess of the expenses incurred in the discharge of that office currently or in the previous 3 years. Yes ___No __

(f) Relationship to anyone holding appointive office currently or in the previous 2 years; spouse, father, mother, son, or daughter. Yes ___No __

(g) Employment, currently or in the previous 3 years, as or by any registered lobbyist of the State government.
Yes ___No __

(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: ☐ _____ _____

Signature of Individual or Authorized Officer — 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 SUBCONTRACTOR listed on the previous page.

☐ _____ _____

Signature of Authorized Officer — Date

RETURN WITH SUBCONTRACT

ILLINOIS DEPARTMENT OF TRANSPORTATION

Form B
Subcontractor: Other Contracts & Financial Related Information 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 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 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 Officer 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)

Illinois Department of Transportation

NOTICE TO BIDDERS

1. **TIME AND PLACE OF OPENING BIDS.** Sealed proposals for the improvement described herein will be received by the Department of Transportation. Electronic bids are to be submitted to the electronic bidding system (iCX-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 a.mJanuary 30, 2015. 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 10:00 a.m.

2. **DESCRIPTION OF WORK**. The proposed improvement is identified and advertised for bids in the Invitation for Bids as:

   Contract No. 72B58
   PIKE-MORGAN Counties
   Section 109RS-6,123RS-3,123B-2,ETC
   Project ACNHPP-ACF-0745(305)
   Route FAP 745
   District 6 Construction Funds

This project consists of the construction of a new structure (SN 069-0016) to carry IL 104 over the Illinois River, building removal, earthwork, construction of a pump station, HMA paving and construction of other bridge substructures and superstructures.

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)

SUPPLEMENTAL SPECIFICATIONS

RECURRING SPECIAL PROVISIONS

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

TABLE OF CONTENTS

STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction, Adopted January 1, 2012", the latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways", and the "Manual of Test Procedures for Materials" in effect on the date of invitation for bids, and the "Supplemental Specifications and Recurring Special Provisions" indicated on the Check Sheet included herein, which apply to and govern the construction of FAP Route 745/FAP Route 310 (IL 104/US 67), Project ACNHPP-ACF-0745(305), Section 109RS-6, 123RS-3, 123B-2, ETC, Pike and Morgan Counties, Contract 72B58 and in case of conflict with any part, or parts, of said Specifications, the said Special Provisions shall take precedence and shall govern.

FAP ROUTE 745/FAP ROUTE 310 (IL 104/US 67)
PROJECT ACNHPP-ACF-0745(305)
SECTION 109RS-6, 123RS-3, 123B-2, ETC
PIKE AND MORGAN COUNTIES
CONTRACT 72B58

LOCATION OF PROJECT

The work on this project is located on IL 104 in Pike and Morgan Counties in Sections 1, 2, 3, 4, 8 and 9 in Township 3S, Range 2W, 4th PM and in Sections 21, 22, 23, 24 Township 16N Range 13W, 3rd PM.

The project begins at a point on the centerline of IL Route 104, approximately 0.043 miles west of the centerline of 385th Ave., Chambersburg in Pike County and extends approximately 7.982 miles to the east along the centerline of IL Route 104 to US Route 67 in Morgan County.

The project includes the following proposed structures:
1. SN 075-0128 IL 104 over McGee Creek Drainage Ditch
2. SN 069-0525 IL 104 over Illinois River
3. SN 069-0522 IL 104 over Washington Street
4. SN 069-7900 and SN 069-07901 Retaining Walls in Meredosia
5. SN 069-PS01 Pump Station in Meredosia

The project includes the removal of structures:
1. SN 075-0128 IL 104 over McGee Creek Drainage Ditch
2. SN 069-0016 IL 104 over Illinois River

The gross length of the project is 7.982 miles. The net length of the project is 7.957 miles.

DESCRIPTION OF PROJECT

The work to be performed under this contract shall include, but not be limited to:

1. Site Clearing and Debris Removal
2. Building and Foundation Removal
3. Concrete Foundation and Concrete Slab Removal
4. Earthwork
5. Sand Drainage Blanket
6. Construction of Bridge Substructures and Superstructures
7. Construction of MSE Walls
8. Hot-Mix Asphalt Paving
9. Concrete Paving
10. Sidewalks
11. Storm Sewer Structures and Pipe
12. Construction of a Pump Station
13. Pavement Marking
14. Landscaping
15. Lighting
16. Signing
17. All incidental and collateral work necessary to complete the project as shown on the plans and as described herein.

MAINTENANCE OF ROADWAYS

Beginning on the date that work begins on this project, the Contractor shall assume responsibility for normal maintenance of all existing and temporary 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. All work necessary to maintain the roadways, including traffic control for maintenance operations, will be paid for in accordance with Article 109.04 of the Standard Specifications.

COMPLETION DATE PLUS WORKING DAYS

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

"When a completion date plus working days is specified, the Contractor shall complete all contract items by 11:59 PM on, **September 30, 2018** except as specified herein.

The Contractor will be allowed **15** working days after the completion date for clean-up and seeding. Temporary lane closures for this work may be allowed at the discretion of the Engineer.

The following are the interim completion dates applicable to this contract:

- The embankment on the west side of the Illinois River between Station 39+00 to Station 60+12.83 (Illinois River Bridge abutment) shall be completed by October 30, 2015.
- The Washington Street Bridge – S.N. 069-0522 shall be completed by June 19, 2017. The Washington Street Bridge will not be open to traffic until The Illinois River Bridge and west side paving operations are complete. Traffic will be shifted onto the bridge in Stage 2.
- The McGee Creek Bridge – S.N. 075-0128 shall be completed by August 15, 2017.
- The west side paving (Station 39+00 to Station 60+12.83) shall be completed by August 23, 2017.
- The IL 104 over Illinois River Bridge – S.N. 069-0525 shall be completed by September 27, 2017.

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

TRAFFIC CONTROL PLAN

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

Special attention is called to Articles 107.09, 107.13, 107.14, 107.15, 107.17 and 701.15 of the Standard Specifications for Road and Bridge Construction and the following traffic control related (1) Highway Standards; (2) Supplemental Specifications and Recurring Special Provisions; (3) other Special Provisions; and (4) Plan Details which are included in this contract:

1) Standards: 701001, 701006, 701011, 701106, 701201, 701301, 701306, 701311, 701321, 701326, 701501, 701801, and 701901.

2) Supplemental Specifications and Recurring Special Provisions:
   a) Supplemental Specifications Section 701 and 706.

3) Special Provisions:
   a) Cleaning of Traffic Control Devices
   b) Changeable Message Signs
   c) Detour Signing
   d) Temporary Information Signing

4) Plan Details:
   a) Staging and Traffic Control Plans (Pre-Stage thru Stage 3)

Limitations of Construction: The Contractor shall coordinate the items of work in order to keep hazards and traffic inconveniences to a minimum, as specified below.

1) The Contractor shall notify the District Six Bureau of Operations at (217) 785-5312 72 hours in advance of beginning work and three (3) weeks prior to implementing any traffic control.

2) During the construction of this section at least one lane shall remain open to traffic at all times.

3) No lane closures will be permitted without flagger protection.

4) The Contractor shall provide, erect, and maintain all necessary barricades, cones, drums, and lights for the warning an protection of traffic, as required by Sections 107 and 701 through 703 of the Standard Specifications, and as modified. The Contractor shall be responsible for the traffic control devices at all times during the construction activities and shall coordinate the items of the work in order to keep hazards and inconveniences to traffic to a minimum.

5) The Contractor shall furnish and erect “Road Construction Ahead” signs (W21-1(O)-48) on IL-104 at both ends of the project, and on IL-99 approaching IL-104. Signs shall also be placed in advance of the work along US 67 and along IL-104 for the resurfacing as applicable.

6) The Contractor shall schedule and conduct his operations so as to ensure the least possible obstruction to traffic, create a minimum of confusion to the public, and conform to Article 107.09 of the Standard Specifications.

7) All advance warning signs shall be in new or like new condition at the start of the project. All warning signs shall be 48 inches by 48 inches and have a black legend on a fluorescent orange reflectorized background.

8) The Contractor shall establish a location in which his/her employees will be allowed to park vehicles with the approval of the Engineer.

9) Sign posts must be 100 x 100 mm (4 x 4 inches) wood posts according to Article 1007.05. The use of metal posts will not be permitted.

10) The Contractor shall notify the Resident Engineer in writing a minimum of 14 calendar days prior to instituting the detour. The notification shall include the location and scheduled start date of the detour. The Contractor will not be allowed to detour traffic without providing the 14 calendar day notice. Delays caused by failure to provide notice shall not be considered justification for an extension of time.

11) The Contractor shall be responsible for the condition of traffic control devices at all times during construction activities and throughout shutdown periods.

Traffic control standards shall be applied as directed by the Engineer. Suggested applications for each standard are as follows:

Traffic Control And Protection, Standard 701001: This traffic control and protection shall be used along IL 104 where work operations are more than 15 feet from the edge of pavement.

Traffic Control And Protection, Standard 701006: This traffic control and protection shall be used along IL 104 for operations that do not encroach closer than two feet from the edge of pavement. Typical applications include: Utility operations, culvert extensions, side slope changes, guardrail installation, delineator installation, landscaping operations, shoulder repair and sign installation.

Traffic Control And Protection, Standard 701011: This traffic control and protection shall be used along IL 104 during shoulder work and utility operations as applicable.

Traffic Control And Protection, Standard 701201: This traffic control and protection shall be used for operations which require traffic to be reduced to one-lane, two-way traffic during the day only. Typical applications include: isolated patching, utility operations, storm sewer, culverts and cable placement.

Traffic Control And Protection, Standard 701301: This traffic control and protection shall be used for operations which require traffic to be reduced to one-lane, two-way traffic for a short duration. Typical applications include: marking patches, field survey, string line, utility operations, and cleaning up debris on pavement.

Traffic Control And Protection, Standard 701306: This traffic control and protection shall be used for operations which require traffic to be reduced to one-lane, two-way traffic for moving operations. Typical applications include: bituminous resurfacing, milling operations, utility operations, and shoulder operations.

Traffic Control and Protection Standard 701311: This traffic control and protection shall be used during pavement marking operations and any other operations which require two-lane, two-way traffic moving operations on IL 104, IL 99 and US 67, as shown in the standard located in the plans.

Traffic Control And Protection, Standard 701321: This traffic control and protection shall be used for operations at the McGee Creek Bridge which require traffic to be reduced to one-lane, two-way traffic (bridge repair with barrier). See additional specification for TEMPORARY BRIDGE TRAFFIC SIGNALS.

Traffic Control and Protection Standard 701326: This traffic control and protection shall be used during construction activities which involve excavation and other work adjacent to an existing edge of pavement which has traffic on it and as shown in the standard located in the plans. Traffic Control Surveillance shall be provided where large drop-offs occur at the edge of pavement, as directed by the Engineer.

Traffic Control and Protection Standard 701501: This traffic control and protection shall be used during pavement patching, storm sewer, and any other operations which require traffic to be reduced to one-lane, two-way traffic (stationary operations) as shown in the standard located in the plans.

Traffic Control and Protection Standard 701801: This traffic control and protection shall be used at any time pedestrian traffic must be rerouted due to work being performed on IL 104 and Main Street, as shown in the standard located in the plans.

Measurement and Payment for Traffic Control and Protection: Traffic Control and Protection Standards 701001, 701006, 701011, 701301, 701311, and 701901 will not be measured for payment. Traffic Control and Protection standards 701201, 701306, 701321, 701326, 701501 and 701801 will be paid for at the contract unit price per Each or Lump Sum for TRAFFIC CONTROL AND PROTECTION STANDARD of the type specified. The pay quantity of each refers to each location and not for each time the traffic control and protection is set up.

Traffic Control Surveillance will be measured and paid for as specified in the Standard Specifications.

Furnishing and placing all short-term, temporary, and permanent pavement marking will be paid for separately.

Furnishing, placing and removing all other traffic control and protection (such as temporary Type III barricades, drums, vertical panels, stop signs, etc…) required will not be measured for payment separately and will be considered as part of the traffic control and protection pay items included in the contract.

If at any time the signs are in place but not applicable, they shall be turned from the view of motorists or covered as directed by the Engineer. The cost of furnishing, erecting, maintaining, and removing (when no longer needed) the required signs shall be included in the cost of contract.

All other traffic control and protection required will not be measured for payment and will be considered included in the cost of the traffic control and protection items.

STATUS OF UTILITIES TO BE ADJUSTED

The following utilities are involved in this project. The utility companies have provided the following:

Name & Address of Utility	Type	Location	Estimated Date of Relocation Completed
Mr. Scott Heikes AmerenCIPS 700 Jersey Street P.O. Box 1089 Quincy, IL 62306 Phone: 1-217-221-0817 Cell: 1-217-653-2264	Electric	PR IL 104 Sta. 81+00 – 100+60 Meredosia Terminal Sta. 6+75 – 13+50 EX IL 104 Sta. 11+00 – 21+00 Main St. Sta. 496+50 – 502+85 North Alley Sta. 740+00 – 750+00 Various Alley locations downtown Meredosia	June 15, 2015
Mr. Anthony E. Sassen Ameren – Division 2 700 Jersey Street P.O. Box 1089 Quincy, IL 62306 Phone: 1-217-221-0869 Cell: 1-217-257-7604 Email: Asassen@ameren.com	Gas	PR IL 104 Sta. 33+00, 40+00, 82+00 – 100+60 EX IL 104 Sta. 13+00 – 21+00 Main St. Sta. 496+50 – 502+85 Washington St 664+10 – 667+00 Putnam St Sta. 601+45 – 605+55 North Alley Sta. 741+00 – 750+00 South Alley Sta. 488+00 – 491+00	June 15, 2015

Name & Address of Utility	Type	Location	Estimated Date of Relocation Completed
Mr. Charles Jenkins Frontier/Verizon North, Inc. 330 West Beecher St., ILLRAOL Jacksonville, Illinois 62650 Phone: 217-243-0211	Telephone	PR IL 104 Sta. 16+50 – 33+50, 43+00 – 55+00, 82+00 – 83+50, 92+000 – 101+50 North Alley Sta. 740+00 – 750+00 Various Alley locations downtown Meredosia EX IL 104 - Sta. 2500+00 – 853+00. Includes Illinois River Bridge.	June 15, 2015 October 15, 2017
Mr. Kirk Thoelke Light Core, A CenturyTel Company 1151 CenturyTel Drive Building A Wentzville, MO 63385 Phone: 1-636-887-4752 Cell: 1-314-495-6318	Fiber Optics	PR IL 104 Sta. 17+00 – 21+00, 33+00 – 55+00, 90+00 – 101+50 PR Main St 490+00 – 500+00 EX IL 104 - Sta. 2500+00 – 853+00. Includes Illinois River Bridge.	June 15, 2015 October 15, 2017
Mr. Carl Attebbery Paetec 102 East Schafter Forsyth, IL 62535 Phone: 1-217-876-7194 Ext. 223 Cell: 1-217-519-0464 Email: Carl.atteberry@paetec.com	Fiber Optics	PR IL 104 Sta. 17+00 – 21+00, 33+00 - 43+00, 90+00 – 101+50 EX IL 104 - Sta. 2500+00 – 853+00. Includes Illinois River Bridge.	June 15, 2015 October 15, 2017

Name & Address of Utility	Type	Location	Estimated Date of Relocation Completed
Mr. Earl Hull Village of Meredosia P.O. Box 14315 Main Street Meredosia, IL 62665 Phone: 1-217-584-1351	Water	PR IL 104 Sta. 82+00 – 101+50 EX IL 104 Sta. 11+50 – 21+00 Main St. Sta. 498+00 – 502+85 Washington St 664+40 – 667+00 Green St. Sta. 682+90 – 683+40, 684+25 – 686+00 Putnam St Sta. 601+45 – 605+55 Morgan St 10+00 – 11+90 North Alley Sta. 741+00 – 743+10	June 15, 2015
Mr. Earl Hull Village of Meredosia P.O. Box 14315 Main Street Meredosia, IL 62665 Phone: 1-217-584-1351	Sanitary Sewer	PR IL 104 Sta. 84+00 – 85+60, 90+00 – 100+60 EX IL 104 Sta. 11+30 – 21+00 Main St. Sta. 498+50 – 502+85 Washing ton St. Sta. 664+50 – 665+50 Green St. Sta. 684+25 – 686+00 Putnam St Sta. 603+30 – 605+55 Morgan St Sta. 10+40 – 11+90 Frontage Road 801+00 – 804+60	June 15, 2015

The above represents the best information of the Department and is only included for the convenience of the bidder. The applicable provisions of Articles 105.07, 107.20, 107.31, and 108.02 of the Standard Specifications for Road and Bridge Construction shall apply.

The estimated utility relocation dates should be part of the progress schedule submitted by the Contractor. If any utility adjustments or relocations have not been completed by the above dates specified and when required by the Contractor's operations after these dates, the Contractor should notify the Engineer in writing. A request for an extension of time will be considered to the extent the Contractor's critical path schedule is affected.

CLEANING OF TRAFFIC CONTROL DEVICES

All traffic control devices shall be kept clean as stated in Article 701 of the Standard Specifications. In addition, the contractor shall make sure the traffic control devices are cleaned after snowfalls or snow plowing if needed or as directed by the Engineer. This work will not be measured for payment or paid for separately and shall be included in the cost of Traffic Control and Protection items.

CHANGEABLE MESSAGE SIGNS

Changeable message signs will be paid for as specified in Article 701.20 of the Standard Specifications.

Basis of Payment. The cost of relocating or removing the changeable message signs shall be included in the cost of the changeable message signs.

DETOUR SIGNING

Description. This work shall consist of furnishing, erecting, maintaining, and removing signs to close Main/Marion St at IL 104 and to mark a detour route during the time that road closures are in effect. This work shall be done as specified in Sections 701 and 702 of the Standard Specifications and as detailed in the plans.

All signs shall be furnished by the Contractor. See additional requirements in the Limitations of Construction in the Traffic Control plan.

Basis Of Payment. This work will be paid for at the contract lump sum price for DETOUR SIGNING.

TEMPORARY INFORMATION SIGNING
Effective: November 13, 1996
Revised: January 2, 2007

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

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

	Item	Article/Section
a.)	Sign Base (Notes 1 & 2)	1090
b.)	Sign Face (Note 3)	1091
c.)	Sign Legends	1092
d.)	Sign Supports	1093
e.)	Overlay Panels (Note 4)	1090.02

Note 1. The Contractor may use 5/8 inch (16 mm) instead of 3/4 inch (19 mm) thick plywood.
Note 2. Type A sheeting can be used on the plywood base.
Note 3. All sign faces shall be Type A except all orange signs shall meet the requirements of Article 1106.01.
Note 4. The overlay panels shall be 0.08 inch (2 mm) thick.

GENERAL CONSTRUCTION REQUIRMENTS

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

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

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

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

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

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

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

TEMPORARY BRIDGE TRAFFIC SIGNALS

Description: This work shall be done according to Sections 701 and 862 of the Standard Specifications, Standard 701321, Plan Details and modified as described herein.

Microwave detectors shall be installed instead of the induction loop detectors shown on Standard 701321.

Materials: The controller shall provide actuated operation for the number of phases required with full menu driven format for ease of data entry. The controller shall show all the timers operating simultaneously.

A standard uninterruptable power supply (UPS) shall be required for the traffic signal cabinet with controller.

All signal heads shall be LED's.

The microwave detector shall be a motion and presence sensor that provides vehicle detection that is not affected by temperature, humidity, color or background variations and shall meet the approval of the Engineer. It shall be capable of tracking multiple moving and stationary vehicles. It shall have an adjustable hold time on stationary objects from 0 to 15 minutes. The microwave detector shall be designed to detect moving vehicles at a maximum range of 300 feet. The microwave detector shall have an ability to accurately discriminate between vehicles arriving and departing. The Contractor shall supply the type of lead-in cable recommended by the manufacturer for his microwave detector.

CONSTRUCTION REQUIREMENTS

General. The Contractor shall mount a metal arm to each near right signal post (an arm for a light fixture would be acceptable). The arm shall be reasonably stationary to prevent false calls on the microwave sensor. The final mounting height of the microwave detector shall be 17.5 feet plus or minus 0.5 feet. The microwave detector shall be horizontally positioned somewhere between the center of the driving lane and two feet (2') from the edge of the driving lane. The microwave detector shall be aimed to a 6 feet height at the stop bar at the center of the driving lane.

The microwave detector voltage shall be the highest allowed by the manufacturer.

At the time of inspection and programming of the controller, one of the Contractor's employees or representatives at the inspection shall be capable of doing all cabinet wiring or controller programming necessary to accomplish the type of operation desired or to modify the cabinet for any unusual conditions.

The UPS shall be installed adjacent to the controller cabinet according to the applicable portions of Article 862.04 and mounted according to Article 701.18(b)(2)d.

No vehicle, trailer, or other large object may be parked between the microwave detector and 500 feet in the direction of approaching traffic.

Where there is an intersecting street or driveway within the limits of the stage construction stop bars, the following specifications shall also apply:

Material: Each signal for an intersecting street or driveway shall consist of one red ball section, one yellow ball section, one green left arrow section, and one green right arrow section with backplate.

Construction Requirements: Signal heads shall be located as shown on the plans.

Detection for the side road and driveway shall consist of a microwave detector. The microwave detector shall be mounted 14 to 18 feet high on the near right post for the side road and driveway.

Each approach of a side road and driveway shall be a separate phase.

When the green proceeds from one side of the bridge to the other, the controller shall time a programmable long all red period. Approaches on the same side of the bridge shall be able to cycle between each other without incurring the long all red time but a shorter programmable time.

The Contractor shall supply and install two (one near right; one far left) NO TURN ON RED signs for each side road and driveway approach.

The Contractor shall be required to remove and store or securely cover any conflicting existing signs.

The Contractor shall be required to restore all original traffic control when the temporary bridge signals are removed.

Basis of Payment: This work shall include the relocation of the temporary bridge traffic signals as required per the staging plans and no additional compensation will be allowed for the relocation of the temporary bridge traffic signals. This work, including the UPS, will be included in the contract unit price each for TEMPORARY BRIDGE TRAFFIC SIGNALS.

FAILURE TO OPEN TRAFFIC LANES TO TRAFFIC

The lane closure over the McGee Creek Bridge per Standard 701321 as shown on the plans is not permitted from October 1 to February 28, and the total duration of the closure shall not exceed six (6) consecutive calendar months. Should the Contractor fail to completely open and keep open two lanes of traffic (one lane in each direction) over the McGee Creek Bridge as specified herein, the Contractor shall be liable to the Department for liquidated damages in accordance with Article 108.09 of the Standard Specifications and any other additional special provision which may be attached herein which supplements Article 108.09.

DEWATERING

Description: This work shall consist of providing labor, tools, equipment, and materials necessary for dewatering (regardless of the water source) work areas to construct: the pump station, Meredosia Terminal, and areas adjacent and tributary to McGee Creek within the Right-of-Way to relatively dry conditions to maintain suitable working conditions and sediment control. The cost of dewatering any other construction areas (i.e. storm sewer, roadway, etc.) shall be included in the cost of that item being constructed.

Products. Contractor shall be responsible for the choice of the product(s) and equipment as well as "means and methods" for the Site Dewatering Work to be performed subject to the review of the Engineer. All products and "means and methods" selected shall be adequate for the intended use/application. Engineer's review does not relieve the Contractor from compliance with the requirements of the Standard Specifications and the requirements of this special provision.

Submittals. Contractor shall submit to Engineer for review a description of dewatering techniques and equipment to be used, together with detail drawings showing lengths of discharge piping and point(s) of discharge including sediment and erosion control procedures using Best Management Practices. Engineer's review of dewatering techniques and equipment shall in no way be construed as creating any obligation on the Owner for same.

Best Management Practices are anticipated (but not limited to) to include:

Sump Pit
Pumps, Hoses, Etc.
Point Source Discharge Protection (Rip Rap with Vegetative Buffer, Etc)
Ditch Checks
Geotextile Fabric
Dewatering Filter Bags
Temporary Sediment Trap
Removal and proper disposal of all BMP's and sediment associated with dewatering
Additional erosion and sediment control BMP's as per Engineer's direction

Responsibility. The Contractor shall be solely responsible for the choice of product(s) and equipment; for the design, installation, and operation; as well as "means and methods" of performing the Work; and subsequent removal of dewatering systems and their safety and conformity with local codes, regulations and these Specifications. All product(s), equipment and "means and methods" selected shall be adequate for the intended use/application. Review by Engineer does not relieve Contractor from compliance with the requirements specified herein.

General Requirements. The Contractor shall select the pumps he/she desires to use and the rate at which the pumps discharge, but adequate protection at the pump discharge shall be provided by the Contractor, subject to review by the Engineer. The Contractor shall ensure that downstream water quality shall not be impaired.

At all times during the excavation period and until completion and acceptance of the Work at Final Inspection, ample means and equipment shall be provided with which to remove promptly and dispose of properly all water (including ground water, river water, storm sewer water, storm runoff, and water generated from Contractor's activities) entering any excavation or any other parts of the Work.

Water pumped or drained from the work required for this Contract shall be disposed of in a safe and suitable manner without damage to adjacent waterways, adjacent property or streets or to other work under construction. Water shall be discharged with adequate erosion and sediment control protection of the surface at the point of discharge. No water shall be discharged into sanitary sewers. No water shall be discharged into storm sewers. Any and all damages caused by dewatering the work shall be promptly repaired by the Contractor. The Contractor is responsible for providing any and all labor, materials and equipment needed for the DEWATERING in order to meet the scheduled completion of the project.

Bypass Pumping. Bypass pumping of waterways, to keep the work areas relatively dry, shall meet the above requirements. The cost of this work is included in the cost of DEWATERING.

Method of Measurement and Basis of Payment. This work will be measured and paid for at the contract lump sum price for DEWATERING.

CONSTRUCTION VIBRATION MONITORING

Description.
This special provision identifies the Contractor's responsibilities for protecting the properties listed below. The Contractor shall develop a work plan which minimizes the potential for possible vibration damage due to the construction and demolition activities near the identified structures. The Contractor is also required to perform pre and post construction surveys, and monitor vibrations at the identified structures in order to protect them from any vibration induced damage. The Contractor will be responsible for any damage caused by his/her activities.

The following properties shall be monitored and protected per the requirements in this special provision.

Property Address	Property Owner(s)	Contact Phone#
210 Main Street	Vickie J. Barfield	217.371.2248
214 Main Street	Rausch & Roate Inc. The Approach Restaurant	217.584.1838
220 Main Street	Prairie State Bank & Trust	217.370.1786
302 Main Street	International Brotherhood of Boilermakers - Local 484	217.584.1916
205 Main Street	Cargill Inc.	217.494.1426
215 Main Street	Scott Gregory - South Side Tavern	217.584.9905
113 N. Washington St	Morgan County Civic Services	217.243.3330
128 N. Washington St	William & Delores Evans	N/A

Pre-Construction Survey.
No information is available concerning the condition of these properties.

The Contractor shall perform a pre-construction condition survey for the interior and exterior of these structures, and provide a copy of survey reports to the Engineer no later than 30 calendar days prior to starting work. The survey shall be performed by a Structural Engineer licensed in the State of Illinois and experienced in evaluating structural vulnerabilities and vibration monitoring.

At a minimum the survey shall document all aspects of the structural condition through observations, actual measurements, plan sketches, photographs, and any other data the preparer may deem appropriate. The survey reports, signed and sealed by the structural engineer, shall be submitted to the Engineer.

The Contractor shall perform a pre-construction condition survey that includes photos and plan sketches indicating existing vulnerabilities, an evaluation of the risk from construction vibration, and recommendation of maximum safe peak particle velocity (PPV) threshold, not to exceed 0.5 inches/second, as measured at or in very close proximity to the monitored structure. The Contractor shall determine the construction methods required to protect the properties listed above based on the pre-construction survey and the safe vibration threshold.

The Contractor is responsible for arranging with the property owner the rights-of-entry to the property in order to engage in condition surveys, vibration monitoring, and crack monitoring.

Monitoring Plan.
The Contractor shall provide to the Engineer a monitoring plan no later than 30 calendar days prior to commencing work. The plan will be reviewed by the Engineer and any comments will be returned to the Contractor within 14 calendar days. The Contractor will then have 7 calendar days to revise the work plan and resubmit a final plan to the Engineer prior to commencing work.

The plan shall describe the following:

1. Construction methods and equipment that the Contractor chooses to use to achieve low project vibration levels.
2. Alternative construction methods and equipment that will be used if the PPV threshold is reached or exceeded.
3. Detailed description of the vibration and structural integrity monitoring systems and if necessary catalog cuts of monitoring equipment that will be used; how the equipment will be calibrated and re-calibrated if necessary during the life of the project; description and schematics if necessary of how the independent components will function as a system.
4. Identification of the individual(s), and their contact information, designated to oversee the vibration and crack monitoring system(s); and daily recording activities required in this specification. A brief description of qualifications or resume of the individual is also required.
5. How site monitoring equipment will be deployed to continuously record vibration events, including crack monitoring during construction activity. Depending on the equipment deployed and method chosen for networking, it is possible there will need to be both electrical and telecommunications connections available at multiple remote locations. The monitoring plan will address how the Contractor will provide utility service to the equipment, protect the equipment from potential vandalism and the elements, and monitor the overall system's day-to-day operation. The plan shall describe in reasonable detail the method and means the Contractor will use to identify and monitor existing cracks and document new cracks. For significant cracks or cracks that appear to have a high potential to migrate, it is recommended that the Contractor employ crack monitoring gauges.
6. Details for establishing and deploying an alarm system to announce immediate shut down of all site activities if a vibration event occurs which exceeds the PPV threshold established for the properties listed above. The alarm system shall include a phone modem which will dial cell phones of the Engineer and Contractor site personnel in the event of an exceedance.
7. Establish a protocol for the identification of the activity or equipment that caused the PPV threshold to be exceeded.
8. Description of the process which will be used to verify that the equipment will function as planned before starting work and the process which will be used to verify (daily) that the equipment remains in calibrated working order.
9. Detail a protocol including responsible parties to be notified if an exceedance occurs. This includes, but is not limited to the Engineer and the lead project inspector.
10. Daily activity log of vibration activity and crack monitors to ensure the identification of the cause of any vibration event. Depending on equipment deployed, crack monitors could be monitored remotely or by visual inspection. In either case, a daily inspection log shall be maintained either in written or electronic form.
11. Daily testing and logging of entire geophone/seismograph/communications network (start of day test) If the equipment fails the daily test, the Contractor shall correct the deficiency before proceeding with planned activities for that day or temporarily suspend work until the equipment is repaired or replaced. All daily logs will be available to the Engineer for review and a summary of daily logging will be provided in the post-condition survey.

Pre-Construction Site Preparation

Crack Monitoring

In accordance with the Monitoring Plan, the Contractor shall mark existing cracks in such a way that future observations would clearly indicate whether cracks remained unchanged, opened, closed, or propagated. The appropriate location, number and type of crack monitoring devices will be established by the Contractor and approved by the Engineer. The Contractor shall monitor and log all cracks daily and immediately notify the Engineer of any observed change.

Vibration Monitoring

In accordance with the Monitoring Plan, all monitoring equipment shall be initially installed and maintained during the project in accordance with manufacturer's recommendations, calibration standards, and specifications. No site work shall begin until all monitoring equipment is deployed and verified to be operating in accordance with manufacturer's recommendations and specifications.

Proof of Installation

The Contractor shall demonstrate that the installed equipment will continuously and accurately measure vibrations, electronically log the vibration history (date/time stamp), and provide a communication notice system that notifies site personnel should the PPV threshold be exceeded. The monitoring equipment shall remain in-place and in operation during all construction activities that may affect these structures.

Vibration Limits

After a thorough conditions evaluation, the Contractor shall propose in the monitoring plan a maximum PPV level for each monitored structure. The PPV level proposed by the Contractor shall be determined by a qualified expert in the field of vibration monitoring. In no case shall the PPV level exceed 1.0 inches/second as measured at or in very close proximity to the monitored structure. To ensure the PPV level is not exceeded, an alarmed monitoring system shall be implemented to signal any vibration event that equals or exceeds the maximum PPV level threshold.

Construction Requirements

The Contractor shall periodically check to ensure that the monitoring system(s) are continuously operating within manufacturer's specifications during the project.

The Contractor shall immediately cease work if the alarm at the structure indicates the PPV threshold is reached or exceeded. In the event of an exceedance, the Engineer shall be notified immediately. The shutdown shall remain in effect until the Contractor has, to the Engineer's satisfaction, identified the cause of the exceedance and addressed the potential for another exceedance by modifying the work process or equipment being used. Work shall not resume until approved by the Engineer.

Post-Construction Survey

The Contractor shall perform a post-construction survey and analysis at the designated structures to determine if any structural changes are the result of the construction activity. The Contractor shall provide the Engineer with a copy of all post construction survey reports, daily log summaries for vibration and crack monitors, and analysis documents comparing pre and post construction structural condition. The survey shall be performed, and the reports signed and sealed, by a Structural Engineer licensed in the State of Illinois.

Method of Measurement

The item Construction Vibration Monitoring will be measured as a lump sum unit of work.

Basis of Payment

The item Construction Vibration Monitoring will be paid for at the contract lump sum price. This price shall be full payment for pre-construction surveys; furnishing, installing, monitoring, and removing crack monitoring gauges; preparing and providing a report documenting crack monitoring during this project; furnishing, installing, monitoring, and removing vibration monitoring equipment; preparing and providing a report documenting vibration data collected during this project; notification of vibration events; post construction surveys; reports; and all labor, equipment and materials necessary to complete the work as described. There will be no compensation for delays as the result of exceeding the PPV threshold or delays from faulty or damaged monitoring equipment. There will be no compensation for adjustment of construction activities or equipment to reduce the vibration levels to less than the maximum PPV, should an exceedance occur.

BRACED EXCAVATION (SPECIAL)

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 of the Standard Specifications and as specified herein. The bracing system shall be designed and installed to prevent the movement of soil, structures, pavements and/or utilities adjacent to the excavated area. The backfill material shall be porous granular backfill conforming to article 1004.05 of the Standard Specifications.

Design and Construction Requirements The bracing system shall support excavations by the use of sheeting, timber or plates. The bracing system shall be designed for the 10-year river water level (Design Elevation) of 443.50 feet. The excavation shall be kept free of water by either pumping or well-point system or seal coat. Due to the granular soils at the site, piping, boiling and quick sand conditions shall be taken into consideration when choosing the dewatering method.

Seal coat, when specified in the plans or otherwise required by the contractor's design and approved by the Engineer, shall be designed and constructed according to article 502.06 (a) of the Standard Specifications.

The Contractor shall submit design calculations and shop drawings prepared and sealed by an Illinois Licensed Structural Engineer for the bracing system. When a seal coat is specified or otherwise required by the contractor's design, its design shall be included in the overall design and design calculations of the bracing system. Shop drawings shall show all necessary details for the construction of the bracing system, and indicate the method for keeping the excavation free of water. The design calculations and shop drawings shall be submitted to the Engineer for review and approval.

The contractor shall also submit a plan-of-action (Plan) if the river level exceeds the Design Elevation. The Plan shall outline measures to protect the levee, and the construction works and personnel while the river level is at or above the Design Elevation, and measures to resume the work when the river level drops below the Design Elevation. The Plan will be subject to approval by the Engineer.

The excavation and bracing system installation shall not proceed without the written 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 fails or is otherwise deemed inadequate, in the judgment of the Engineer, the Contractor shall, at his own expense, take all necessary steps to prevent the movement of soil, structures, pavements and/or utilities adjacent to the excavated area, and restore the excavated area to a safe working 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.

In order to prevent heaving or piping in excavation where concrete seal is required, the contractor shall perform the excavation, place concrete seal and allow at least 3 days of curing during a period when the river level is forecasted to be at or below 430.0'.

During construction, if the river level is forecasted to exceed the Design Elevation, the Contractor shall seek the Engineer's directions for implementation of the Plan.

Method of Measurement Braced excavation shall be measured in cubic yards according to the requirements for cofferdam excavation as specified in Section 502.12 of the Standard Specifications. Seal coat shall be measured in cubic yards according to Section 503.21 of the Standard Specifications.

Basis of Payment Braced excavation will be paid for at the contract unit price per cubic yard for BRACED EXCAVATION (SPECIAL). Payment for BRACED EXCAVATION (SPECIAL) will be limited to those locations shown on the plans. All sheeting and bracing members associated with braced excavation will not be measured for payment but shall be included in the cost for BRACED EXCAVATION (SPECIAL). The cost of keeping excavation free of water when the river level is at or below design elevation shall be included in the cost of BRACED EXCAVATION (SPECIAL).

Seal coat, if specified in the plans, will be paid for at the contract unit price per cubic yard for SEAL COAT CONCRETE. Seal coat otherwise required by the contractor's proposed design will not be paid for separately, but shall be included in the cost of BRACED EXCAVATION (SPECIAL).

The cost of preparing and submitting the Plan shall be included in the cost of BRACED EXCAVATION (SPECIAL); the cost of implementing the Plan, if needed, will be paid for according to article 109.04 of the Standard Specifications.

No separate payment will be made for structure excavation where braced excavation is shown.

ENGINEER'S FIELD OFFICE, TYPE A (SPECIAL)

Description: This work shall consist of furnishing and maintaining an engineer's field office in accordance with Articles 670.01 and 670.02 of the Standard Specifications except as herein modified.

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

Engineer's Field Office Type A (Special). Type A (Special) field offices shall have a minimum ceiling height of not less than 7 ft (2 m) and a floor space of 1,100 sq ft. The office shall be provided with sufficient heat, natural and artificial light, and air conditioning.

Delete "where available" from the first sentence of the fifth paragraph of Article 670.02.

Revise the following subparagraphs of Article 670.02 to read:

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

(e) Two - six foot folding tables with 12 folding chairs.

(j) One wireless printer/copier machine capable of reproducing prints up to 11 x 17 in. (280 x 432 mm) with an automatic feed tray capable of storing 30 sheets of paper. Letter size and 11 x 17 in. (280 x 432 mm) paper shall be provided.

(l) Four telephones, with touch tone, where available, and a digital telephone answering machine, for exclusive use by the Engineer.

Add the following subparagraphs to Article 670.02.

(s) One oven with stove (gas or electric).

(t) One kitchen sink.

Basis of Payment. The basis of payment shall be according to Article 670.07 of the Standard Specifications except that the building or buildings fully equipped as specified will be paid for at the contract unit price per calendar month or fraction thereof for ENGINEER'S FIELD OFFICE, TYPE A (SPECIAL).

ENGINEER'S FIELD LABORATORY

In addition to the items listed in Article 670.05 of the Standard Specifications, the Contractor shall furnish a 20 ± inch box fan and a microwave oven having a variable power output up to at least 700 watts. The microwave oven shall enable the operator to directly input cooking time.

These items will not be paid for separately, but shall be included in the contract unit price per calendar month or fraction thereof for ENGINEER'S FIELD LABORATORY.

WATER TRANSPORTATION FOR ENGINEER

Description. The Contractor will provide a safe, serviceable, 40 HP minimum motor powered boat and an adequate dock for the exclusive use of the Engineer, representatives of the Department of Transportation or representatives of the Federal Highway Administration in the control of work. The boat will be operated by the Department of Transportation personnel and shall be available for use during all periods when work is in process. The boat shall be a minimum 18' in length. The boat shall be equipped with six life jackets, running lights for nighttime operation, two paddles, and an anchor capable of preventing drift in the case of motor failure and shall be provided with bumpers to protect the side while landing at barges or docks. Additional items associated with the boat and/or maintenance of the boat such as gas, oil, filters, and lubrication shall be the responsibility of the contractor. The boat shall be licensed to operate on the Illinois River and shall meet the approval of the Engineer.

Insurance shall be provided by the contractor meeting the requirements of Article 107.27 of the Standard Specifications for Road and Bridge Construction. IDOT shall be named as an additional insured on the policy. A copy of the required boat insurance shall be submitted to the IDOT prior to the performance of any work.

Basis of Payment. The cost of furnishing a boat and dock with proper equipment, including all operating expenses including insurance and maintenance will be paid for at the contract unit price per calendar month, or fraction thereof, for WATER TRANSPORATION FOR ENGINEER.

EROSION CONTROL, TEMPORARY PIPE SLOPE DRAIN

Description. This work shall consist of furnishing, installation, maintenance, and removal of pipe, anchor devices, filter fabric, rip rap and flared end sections to convey surface runoff down the face of fill slopes to minimize erosion on the slope face according to the details shown on the plans and as directed by the Engineer.

Materials. Materials shall be according to the following:

(a) Polyethylene Pipe 1040.04

(b) Flexible Polyethylene Tubing.....ASTM F667

(c) Geotextile Fabric.....1080.02

(d) Filter Fabric.....1080.03

(e) Rip Rap.....1005.01

(f) Staples .....1081.10(d)

(g) Flared End Section. The flared end section shall be of the same material and size used for the temporary pipe slope drain.

Construction Requirements. The erosion control, temporary pipe slope drain shall be securely anchored to the slope using procedures recommended by the manufacturer. All connections are to be watertight. A flared end section shall be attached to the inlet end of the pipe and shall be relocated each time the pipe is extended. The height of the earth dike at the location of the temporary pipe slope drain shall be at least 2 times the diameter of the pipe. To prevent erosion around the flared end section, geotextile fabric shall be placed under the flared end section and shall extend 5 feet in front of it and up the front face of the berm.

Method of Measurement. This work will be measured for payment per each, where each is defined as one complete installation.

Basis of Payment. This work will be paid for at the contract unit price per each for EROSION CONTROL, TEMPORARY PIPE SLOPE DRAIN.

TEMPORARY BERM

Description. This work shall consist of the construction of a temporary berm according to the details shown on the plans and Sections 204 and 205 of the Standard Specifications, and the removal of the berm according to Section 202 of the Standard Specifications.

Method of Measurement. The construction of the temporary berm will be measured for payment according to Article 204.07 of the Standard Specifications. The removal of the temporary berm will be measured for payment according to Article 202.07 of the Standard Specifications.

Basis of Payment. The construction of the temporary berm will be paid for at the contract unit price per cubic yard for TEMPORARY BERM. The removal of the temporary berm will be paid for at the contract unit price per cubic yard for REMOVAL OF TEMPORARY BERM.

MAINTENANCE MOWING

This work shall consist of mowing all areas of existing turf within the right of way along the entire project limits along existing and proposed IL 104 and within the project limits in downtown Meredosia to a height of not more than 3". The equipment used shall be capable of completely severing all growth at the cutting height and distributing it evenly over the mowed area. The cut material shall not be windrowed or left in a lumpy or bunched condition. Subsequently, mowing may be required, as directed by the Engineer, on certain areas in order to disperse the mowed material. The Contractor will not be required to mow continuously wet ditches and drainage ways, slopes 1:3 (V:H) and greater, or areas which may be designated as not mowable by the Engineer. More than one cycle of mowing may be required during the duration of this contract.

Debris encountered during the mowing operation which hamper the operation or are visible from the roadway shall be removed and disposed of according to Article 202.03. Damage to the right-of-way and turf, such as ruts or wheel tracks more than 2" in depth, shall be repaired to the satisfaction of the Engineer prior to final inspection.

Each mowing cycle will be paid for at the contract unit price per acre for MAINTENANCE MOWING. Any subsequent mowing required to obtain a height of not more than 3" or to disperse mowed material will be considered as included in the cost of the initial mowing. Removal and disposal of debris and any repairs due to damage of the right-of-way or turf will not be paid for separately but will be considered as included in the cost of the mowing.

TRANSVERSE DRAINS COMPLETE **6M16 10/27/11**

This work consists of constructing transverse drains at locations shown in the plans or directed by the Engineer. Transverse drains shall be constructed according to the details shown in the plans and applicable portions of Section 601 of the Standard Specifications.

Perforated and non-perforated pipe shall be corrugated polyethylene pipe with a smooth interior meeting the requirements of Article 1040.04. All pipes shall have a 4 inch inside diameter.

Backfill and bedding aggregate shall consist of CA-16 gravel or crushed gravel or FA 4 natural sand. Capping aggregate shall be CA-7 crushed stone. All aggregate shall be reasonably free of objectionable deleterious material. Limestone CA-16 or sand shall not be allowed. Backfill and capping aggregate shall be compacted in separate operations to the satisfaction of the Engineer.

This work shall be paid for at the contract unit price each for TRANSVERSE DRAINS COMPLETE.

EMBANKMENT 6M3 06/27/13

Embankments shall be constructed according to Section 205 of the Standard Specifications, except as modified by this Special Provision.

When embankments are to be constructed on hillsides or existing slopes which are steeper than 3H:1V, steps shall be cut into the existing slope as shown in the plans or as directed by the Engineer.

All material proposed for use in embankment construction shall be approved by the Engineer. Soils exhibiting the following properties shall not be allowed:

Standard Dry Density (AASHTO T 99) less than 90 pcf.
Organic Content (AASHTO T 194) greater than 10 percent.
Liquid Limit (AASHTO T 89) greater than 60.

Soils exhibiting the following properties shall be restricted to the interior of the embankment:

Less than 35% passing the #200 sieve.
Liquid Limit (AASHTO T 89) greater than 50 but less than 60.
Plasticity Index (AASHTO T 90) less than 12.

The Engineer may restrict or prohibit the use of materials other than those identified above, which exhibit potential for significant erosion or excessive volume change.

Restricted soils shall be encapsulated by 6 to 8 ft, measured horizontally, of unrestricted soil as shown in the plans or directed by the Engineer. The encapsulation shall be placed concurrently with restricted soils. The difference in elevation between the restricted soil and encapsulation shall not exceed 3 ft without the Engineer's approval. Topsoil or rip rap shall not be included in the encapsulation.

The quantity and size of stones or rock fragments incorporated with soil materials shall not prevent placement in the required lift thickness, disking, or achieving uniform compaction. If the Engineer determines the rock material quantity and gradation minimizes potential void formation and the soil quantity is insufficient to affect performance, the material may be considered rock embankment. Rock embankment shall be placed in 12 inch lifts. Lifts shall be compacted or seated using a method approved by the Engineer. Shale shall be placed, broken down, and compacted in the same manner as soil. The addition of water may be required to break down shale.

Where lime modified soil is shown on the plans, materials placed in the top 2 ft of embankments shall have a clay content greater than or equal to 15% over the width of improved subgrade. Clay is defined according to AASHTO M 145. Clay content shall be determined according to AASHTO T 88. In addition to the clay content requirement, no rock, stones or broken concrete more than 2 inches in largest dimension shall be allowed in the top 2 ft.

Where subbase granular material is shown in the plans, the top 1 ft of embankments shall have an immediate bearing value (IBV) of 6 or greater within the limits of the subbase granular material. IBV will be determined using a dynamic cone penetrometer according to Illinois Test Procedure 501. When an embankment is constructed of granular materials, the IBV requirement shall not apply.

All embankment lifts shall be compacted to not less than 95% of the standard laboratory density. The standard laboratory density shall be the maximum dry density determined according to Illinois Modified AASHTO T 99 (Method C) or Illinois Modified AASHTO T 272.

If embankment lifts are unstable after achieving the required density, the Contractor shall reprocess and compact the unstable material as directed by the Engineer. The Engineer may determine a maximum moisture content to correct or prevent stability problems during embankment construction.

This work will not be paid for separately, but shall be considered included in the unit prices for Earth Excavation, and/or Furnished Excavation.

GEOTECHNICAL DATA **6M5 2/10/04**

A subsurface investigation has been performed for this project. Geotechnical data including boring logs and laboratory test results are available for Contractor review prior to bidding. The data can be reviewed at the District 6 Annex located at 2713 Stevenson Drive in Springfield. Contact the District Geotechnical Engineer at 217-782-6709.

SETTLEMENT WAITING PERIOD AND SETTLEMENT PLATFORMS **01/17/14**

A settlement waiting period of 21 calendar months is required between embankment completion to finished earth grade and start of mainline paving operations from Station 39+00 to Station 60+12.83 (back of West Abutment). The 21 month waiting period includes restriction of all construction relating to bridge approach pavement. The start date for settlement will begin after the initial completion of the highest fill section of embankment at station 60+12.83.

The Contractor shall install settlement platforms according to Article 204.06 prior to placing embankment materials at the following locations:

Permanent Platforms

Station 59+83 @ 0.0 ft. Offset	Station 50+00 @ 0.0 ft. Offset
Station 59+00 @ 0.0 ft. Offset	Station 46+00 @ 0.0 ft. Offset
Station 55+00 @ 0.0 ft. Offset	Station 41+00 @ 0.0 ft. Offset

The Engineer will obtain settlement pipe elevation data immediately before and after cutting the pipe to grade.

Paving will be allowed before the end of the 21 month waiting period if the Engineer determines settlement is complete. Settlement platform data shall be gathered on a weekly basis.

This work will not be paid for separately but shall be included in the contract price for earth excavation, and/or furnished excavation.

BRIDGE APPROACH PAVEMENT CONSTRUCTION SEQUENCE **6M1 04/12/10**

Construction of the concrete pad, bridge approach pavement, and bridge approach pavement transition or flexible pavement connector shall be performed in the sequence described below. The purpose of this sequence is to minimize the potential for bridge approach pavement settlement.

1. New embankment shall be completed to finished earth grade between the plan limits of abutment excavation and a point 300 ft behind the abutment.

2. A minimum waiting period of 4 calendar months shall elapse between the completion of embankment and start of excavation for the approach pavement concrete pad.
    2a. An additional settlement waiting period may be included in a separate Settlement Waiting Period special provision. The 4 month period described in item 2 is considered part of the total settlement waiting period.
    2b. When paving in the vicinity of the structure will not immediately follow the waiting periods described in items 2 and 2a, the waiting period should be extended until 2 weeks prior to paving.

3. Excavation for the concrete pad and concrete pad construction shall be performed.

4. Bridge approach pavement and transition/connector pavement shall be constructed.

The waiting period described in items 2, 2a, and 2b does not apply to lime modification beneath the bridge approach transition/connector pavement. However, the lime modified soil shall not be trimmed until the end of the waiting period. The waiting period may be reduced by the Engineer based on settlement platform data.

This work will not be paid for separately but shall be included in the contract price for CONCRETE STRUCTURES and CONCRETE SUPERSTRUCTURE.

Settlement platforms will not be paid for separately but shall be included in the contract price for pay items associated with earthwork.

ROCKFILL – EMBANKMENT **6M21 01/21/14**

This work consists of constructing a layer of rockfill to provide a stable platform for earth embankment construction. When shown on the plans, the rockfill limits and thickness shall be confirmed by the Engineer prior to starting this work.

When directed by the Engineer, ditches shall be cut to plan grade and the existing ground shall be disked to a depth of 12 inches each day for three consecutive drying days prior to determining rockfill limits.

Rockfill materials shall meet the requirements of Article 1005.01 of the Standard Specifications. The gradation of rockfill shall be primary crusher run. Shot rock may be used in rockfill layers exceeding 2 ft thick. The maximum shot rock dimension shall be 18 inches. All rockfill shall be well graded. Rockfill may contain broken pavement or rock excavation with the approval of the Engineer.

Where shown on the plans or directed by the Engineer, excavation shall be performed according to Section 202 of the Standard Specifications. Excavated material may be placed in fills according to Article 202.03 with the approval of the Engineer.

Rockfill shall be placed starting at one end of the designated area and advancing from previously placed material. No compaction of rockfill is required. When rockfill is placed above the existing ground line, the slope shall be capped with a minimum of 2 ft of unrestricted soil measured horizontally. Rockfill shall not be incorporated within the top 2 ft of embankments unless shown on the plans or approved by the Engineer.

This work will be measured and paid for at the contract unit price per cubic yard for ROCKFILL – EMBANKMENT.

SAND DRAINAGE BLANKET

The work of this item consists of furnishing all materials and equipment necessary for the construction of a sand drainage blanket to form a horizontal drainage layer between the proposed embankment and the existing or prepared ground surface.

Materials. The sand for the drainage blanket shall conform to Section 1003 of the Standard Specifications. The gradation shall be FA 6, except that the percentage passing the 75 micron (No. 200) sieve shall be 2 ± 2.

Construction Requirements. The sand drainage blanket shall be constructed to the thickness and within the lines and grades shown on the plans. Sand may be placed by end dumping or other approved method, and spread uniformly over the site to the neat lines shown on the plans. The sand shall be compacted to a minimum of 90% of the standard laboratory density (ASTM D-698) in order to provide a stable base for the embankment.

Prior to placement of the embankment, the sand drainage blanket shall be reshaped if necessary to conform to the lines shown on the plans.

Any damage to the pipe underdrains while placing the sand blanket and/or embankment shall be repaired by the Contractor. There will be no additional payments for such repairs.

Method of Measurement. The sand drainage blanket will be measured as cubic yards (cubic meters) of sand placed and no allowance will be made for any sand placed outside the lines as specified herein or as directed by the Engineer.

Basis of Payment. The sand drainage blanket will be paid for as plan quantity at the contract unit price per cubic yard (cubic meter) for SAND DRAINAGE BLANKET. No additional payment will be made for additional sand placed because of settlement.

MEDIAN SURFACE REMOVAL

Description. This work consists of removal and disposal of existing concrete median surface. This work shall be done as specified in section 440 of the Standard Specifications.

Method of Measurement. Removal of concrete median surface 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 foot for MEDIAN SURFACE REMOVAL.

STUMP REMOVAL ONLY

Description. This work shall consist of the cutting, grubbing, removal, and disposal of stumps, as hereinafter defined in accordance with the applicable portions of Section 201 of the Standard Specifications, and as specified herein.

Definitions. Tree stump – The remaining portion of a tree (as defined in Article 201.02) that has been cut off at or near ground level and the remaining portion of a tree (as defined in Article 201.02) where a substantial portion of the tree trunk remains but almost all of the tree limbs have been removed during utility relocation construction. A multiple-stem tree stump that forks below the 4.5 ft point of measurement will be considered a cluster of individual stumps. A multiple-stem tree stump that forks at or above the 4.5 ft point of measurement will be considered a single tree stump.

Tree stumps will not be considered as trees for purposes of measurement and removal.

Tree stumps removed during the performance of the work for tree removal will not be measured and paid for separately.

Method of Measurement. This work will be measured for payment per unit of diameter where one unit is equal to 1 in. The diameter will be measured at a point 4.5 ft above the highest ground level at the base of the tree stump or at the elevation of cut off, whichever is lower, and will be determined by dividing the measured circumference of the tree stump by 3.1416.

Basis of Payment. This work will be paid for at the contract unit price per unit diameter for STUMP REMOVAL ONLY.

PORTLAND CEMENT CONCRETE SIDEWALK 4 INCH, SPECIAL

This work shall consist of constructing colored portland cement concrete sidewalk at locations shown on the plans and as directed by the Engineer in accordance with Section 424 of the Standard Specifications and details shown in the plans, except as modified herein.

The sidewalk shall be stamped per the details in the plans. The Contractor shall submit a sample of the stamp pattern and color for approval prior to placing any materials. The joints in the stamps shall be no more that ¼ wide.

The Contractor will be required to prepare a 1 SQ YD full scale mock-up sample. The accepted mock-up will be the standard by which remaining work will be evaluated for technical and aesthetic merit. The mock-up may be in a location of proposed installation where it may remain if approved by the Engineer. The stamp forms used are to become property of the Village of Meredosia once the project is complete. The Contractor shall deliver the stamps to the Village.

Materials. The concrete shall be integrally colored red. Materials shall meet the following requirements.

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

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

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

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

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

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

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

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

b) Pigment for Integrally Colored Concrete. The pigment shall meet the requirements of ASTM C 979, match color number 30166 of Federal Standard 595, and be on the Department's Approved list of Pigments for Integrally Colored Concrete.

Method of Measurement. This item of work will be measured for payment per square foot for constructing the proposed colored pavement as required in the plans, specifications, and these Special Provisions.

Basis of Payment. This work will be paid for at the contract unit price per square foot for PORTLAND CEMENT CONCRETE SIDEWALK 4 INCH, SPECIAL, which price shall be payment in full for completing all work specified herein and no additional compensation will be allowed.

HOT-MIX ASPHALT BASE COURSE, (VARIABLE DEPTH)

Description. This work shall consist of constructing hot-mix asphalt base course on a prepared subgrade as shown on the plans and Section 355 of the Standard Specifications and as specified herein.

Surface Test. Revise the last sentence of Article 355.08 of the Standard Specifications to read:

"Areas which have variations exceeding 3/8 in. in 16 ft. shall be removed by the Contractor with an approved grinding device consisting of multiple saws and as directed by the Engineer. The use of a bush hammer or other impact devices will not be allowed."

Tolerance in Thickness. Delete Article 355.09 of the Standard Specifications.

Method of Measurement. This work will be measured for payment according to the requirements for binder course specified in Article 406.13(b) of the Standard Specifications. The width 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 ton for HOT-MIX ASPHALT BASE COURSE, (VARIABLE DEPTH).

HOT-MIX ASPHALT REMOVAL (SPECIAL)

Description. This work shall consist of the full-depth removal of hot-mix asphalt at the location(s) shown on the plans in accordance with Section 440 of the Standard Specifications and as specified herein.

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

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

(b) Measured Quantities. This work will be measured for payment in place and the area computed in square yards. The width of measurement shall be the width of the top of the hot-mix asphalt as shown on the plans.

Basis of Payment. This work will be paid for at the contract unit price per square yard for HOT-MIX ASPHALT REMOVAL (SPECIAL).

HOT-MIX ASPHALT SURFACE REMOVAL, VARIABLE DEPTH

This work shall consist of providing the labor and equipment necessary to complete hot-mix asphalt surface removal in accordance with the applicable portions of Section 440 of the Standard Specifications at the locations in the plans and as directed by the Engineer.

The intent is to mill the existing hot-mix asphalt pavement a minimum ½" in all areas to remove rutting. In the tangent areas noted in the plans, the pavement shall be milled ½" at the centerline and variable thickness on the lanes to remove rutting and correct cross slope of 1.5%. The hot-mix asphalt surface removal and the disposal of the cuttings shall be in accordance with the applicable portions of Section 440 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per square yard for HOT-MIX ASPHALT SURFACE REMOVAL (VARIABLE DEPTH) which price shall include all labor and equipment necessary to complete the work as specified to the satisfaction of the Engineer.

HOT-MIX ASPHALT MIXTURE IL-19.0CB 6M18 08/12/2014

Description: This work shall consist of producing an IL-19.0CB Mixture for pay items shown in the plans. The mixture shall meet the contract requirements for a high ESAL mixture of the N design and liquid asphalt grade specified with the following modifications.

Mixture Composition:

High ESAL, MIXTURE COMPOSITION (% PASSING) [1/]		
Sieve Size	IL-19.0CB	
	min	max
1 1/2 in (37.5 mm)		
1 in. (25 mm)		100
3/4 in. (19 mm)	82	100
1/2 in. (12.5 mm)	50	85
3/8 in. (9.5 mm)		
#4 (4.75 mm)	24	50 [2/]
#8 (2.36 mm)	20	36
#16 (1.18 mm)	10	25
#30 (600 μm)		
#50 (300 μm)	4	12
#100 (150 μm)	3	9
#200 (75 μm)	3	6
Ratio Dust/Asphalt Binder		1.0

1/ Based on percent of total aggregate weight

2/ The mixture composition shall not exceed 40 percent passing the #4 (4.75 mm) sieve for binder courses with Ndesign ≥ 90.

Volumetric Requirements:

VOLUMETRIC REQUIREMENTS High ESAL		
	Voids in the Mineral Aggregate (VMA), % minimum	Voids Filled with Asphalt Binder (VFA), %
Ndesign	IL-19.0CB	
50	13.0	65 - 78
70		65 - 75
90		

Quality Control/Quality Assurance (QC/QA):

DENSITY CONTROL LIMITS		
Mixture Composition	Parameter	Individual Test
IL-19.0CB	$N_{design} \geq 90$	93.0 – 96.0 %
IL-19.0CB	$N_{design} < 90$	93.0 – 97.4 %

HOT MIX ASPHALT – N50 MIXTURES **6M8 11/1/13**

N50 High ESAL mixtures are exempt from the Hamburg Wheel Mix Design Test Criteria described in the Special Provision for Hot Mix Asphalt – Mixture Design Verification and Production.

IL 9.5 N50 High ESAL mixtures are exempt from the Voids in the Mineral Aggregate (VMA) requirement described in the Special Provision for Hot Mix Asphalt – Mixture Design Composition and Volumetric Requirements. The minimum VMA requirement is 14.5%.

QC/QA OF CONCRETE MIXTURES APPLICABLE ITEMS **6M9 07/06/12**

The Special Provision for Quality Control/Quality Assurance of Concrete Mixtures shall apply to the following:

Pay Item:	All Items Utilizing Self-Consolidating Concrete
Location:	All Applicable
Pay Item:	Concrete Superstructure
Location:	All
Pay Item:	Concrete Structures
Location:	Illinois River Bridge 069-0525

HOT MIX ASPHALT QUALITY CONTROL FOR PERFORMANCE (BMPR)
Effective: January 1, 2012
Revised: January 1, 2013

Description. This special provision describes the procedures for production, placement and payment of hot-mix asphalt (HMA). This work shall be according to the Standard Specifications except as modified herein. This special provision shall apply to HMA mixtures as listed in the following table.

Mixture/Use:	Leveling Binder (Machine Method) N70
Location:	IL 104 and IL 99 Resurfacing
Mixture/Use:	HMA Surface Course, Mix "C", N70
Location:	IL 104 and IL 99 Resurfacing
Mixture/Use:	HMA Pavement (Full Depth), 10 ¾"
Location:	IL 104 Mainline

Exceptions may be approved for small tonnage less than 800 (725 metric) tons and miscellaneous mixture applications as defined by the Engineer.

Delete Articles:	406.06(b)(1), 2nd Paragraph	(Temperature requirements)
	406.06 (e), 3rd Paragraph	(Pavers speed requirements)
	406.07	(Compaction)
	1030.05(a)(4, 5, 9,)	(QC/QA Documents)
	1030.05(d)(2)a.	(Plant Tests)
	1030.05(d)(2)b.	(Dust-to-Asphalt and Moisture Content)
	1030.05(d)(2)d.	(Small Tonnage)
	1030.05(d)(2)f.	(HMA Sampling)
	1030.05(d)(3)	(Required Field Tests)
	1030.05(d)(4)	(Control Limits)
	1030.05(d)(5)	(Control Charts)
	1030.05(d)(7)	(Corrective Action for Field Tests (Density))
	1030.05(e)	(Quality Assurance by the Engineer)
	1030.05(f)	(Acceptance by the Engineer)
	1030.06(a), 3rd paragraph	(Before start-up…)
	1030.06(a), 7th paragraph	(After an acceptable…)
	1030.06(a), 8th paragraph	(If a mixture…)
	1030.06(a), 9th paragraph	(A nuclear/core…)

Definitions:

(a) Quality Control (QC): All production and construction activities by the Contractor required to achieve the required level of quality.

(b) Quality Assurance (QA): All monitoring and testing activities by the Engineer required to assess product quality, level of payment, and acceptability of the product.

(c) Pay Parameters: Pay Parameters shall be field Voids in the Mineral Aggregate (VMA), voids, and density. Field VMA will be calculated using the combined aggregates bulk specific gravity (G_{sb}) from the mix design.

(d) Mixture Lot. A lot shall begin once an acceptable test strip has been completed and the AJMF has been determined. If the test strip is waived, a sublot shall begin with the start of production. A mixture lot shall consist of four sublots unless it is the last or only lot, in which case it may consist of as few as one sublot

(e) Mixture Sublot. A mixture sublot for field VMA, voids, and Dust/AC shall be 1000 tons (910 metric tons).

- If the remaining quantity is greater than 200 but less than 1000 tons, a sublot will consist of that amount.
- If the remaining quantity is less than or equal to 200 tons, the quantity shall be combined with the previous sublot.

(f) Density Interval. Density Intervals shall be every 0.2 mile (320 m) for lift thickness equal to or less than 3 in. (75 mm) and 0.1 mile (160 m) for lift thickness greater than 3 in. (75 mm).

(g) Density Sublot. A sublot for density shall be the average of five consecutive Density Intervals. If a Density Interval is less than 200 ft (60 m), it will be combined with the previous Density Intervals.

- If one or two Density Intervals remain outside a sublot, they shall be included in the previous sublot.

- If three or more Density Intervals remain, they shall be considered a sublot.

(h) Density Test: A density test consists of a core taken at a random longitudinal and transverse offset within each Density Interval. The HMA maximum theoretical gravity (G_{mm}) will be based on the running average of four Department test results. Initial G_{mm} will be based on the average of the first four test results. If less than four G_{mm} results are available, use an average of all available Department G_{mm} test results.

The random transverse offset excludes a distance from each outer edge equal to the lift thickness or a minimum of 4 in. (100 mm). If within one foot of an unconfined edge, 2.0 percent density will be added to the density of any core.

Quality Control (QC) by the Contractor:

The Contractor's QC plan shall include the schedule of testing for both pay parameters and non-pay parameters required to control the product such as asphalt binder content and mixture gradation. The minimum test frequency shall be according to the following table.

Minimum Quality Control Sampling and Testing Requirements

Quality Characteristic		Minimum Test Frequency
Mixture Gradation		1 per sublot
Asphalt Binder Content		
Dust/AC Ratio		
Field VMA		
Voids	G_{mb}	
	G_{mm}	

The Contractor's splits in conjunction with other quality control tests shall be used to control production.

The Contractor shall submit split jobsite mix sample test results to the Engineer within 48 hours of the time of sampling. All QC testing shall be performed in a qualified laboratory by personnel who have successfully completed the Department's HMA Level I training.

Quality Assurance (QA) by the Engineer:

Voids, field VMA and Dust/AC ratio: The Engineer will determine the random tonnage and the Contractor shall be responsible for obtaining the sample according to the "PFP Hot-Mix Asphalt Random Jobsite Sampling" procedure.

Density: The Engineer will identify the random locations for each density testing interval. The Contractor shall be responsible for obtaining the four inch cores within the same day and prior to opening to traffic unless otherwise approved by the Engineer according to the "PFP Random Density Procedure". The locations will be identified after final rolling and cores shall be obtained under the supervision of the Engineer. All core holes shall be filled immediately upon completion of coring. All water shall be removed from the core holes prior to filling. All core holes shall be filled with a rapid hardening mortar or concrete which shall be mixed in a separate container prior to placement in the hole. Any depressions in the surface of the filled core holes greater than 1/4 inch at the time of final inspection will require removal of the fill material to the depth of the lift thickness and replacement.

The Engineer will witness and secure all mixture and density samples. The Contractor shall transport the secured sample to a location designated by the Engineer.

The Engineer will test one or all of the randomly selected split samples from each lot for voids, field VMA and dust/AC ratio. The Engineer will test a minimum of one sample per project. The Engineer will test all of the pavement cores for density. All QA testing will be performed in a qualified laboratory by personnel who have successfully completed the Department's HMA Level I training. QA test results will be available to the Contractor within 10 working days from receipt of secured cores and split mixture samples.

The Engineer will maintain a complete record of all Department test results and copies will be provided to the Contractor with each set of sublot results. The records will contain, as a minimum, the originals of all Department test results and raw data, random numbers used and resulting calculations for sampling locations, and quality level analysis calculations.

If the QA results do not meet the 100% sublot pay factor limits or do not compare to QC results within the precision limits listed below, the Engineer will test all split mix samples for the lot.

Test Parameter	Limits of Precision
G_{mb}	0.030
G_{mm}	0.026
Dust/Asphalt AC Ratio	0.20
Field VMA	1.0 %

Acceptance by the Engineer: All tests shall be within the acceptable limits listed below:

Parameter		Acceptable Limits
Field VMA		-1.0 – +3.0% 1/
Voids		2.0 – 6.0% 2/
Density:	IL-9.5, IL-12.5, IL-19.0, IL-25.0, IL-4.75, IL-9.5FG 4/	90.0 – 98.0%
	SMA	92.0 – 98.0%
Dust / AC Ratio		0.4 – 1.6 3/

1/ Based on minimum required VMA from mix design
2/ The acceptable range for SMA mixtures shall be 2.0% - 5.0%
3/ Does not apply to SMA.
4/ Acceptable density limits for IL-9.5FG placed less than 1.25 in. shall be 89.0% - 98.0%

In addition, no visible pavement distresses shall be present such as, but not limited to, segregation, excessive coarse aggregate fracturing or flushing.

Basis of Payment: Payment will be based on the calculation of the Composite Pay Factor using QA results for each mix according to the "QCP Payment Calculation" document.

Dust / AC Ratio. A monetary deduction will be made using the pay adjustment table below for dust/AC ratios that deviate from the 0.6 to 1.2 range.

Dust / AC Pay Adjustment Table[1/]

Range	Deduct / sublot
$0.6 \le X \le 1.2$	$0
$0.5 \le X < 0.6$ or $1.2 < X \le 1.4$	$1000
$0.4 \le X < 0.5$ or $1.4 < X \le 1.6$	$3000
$X < 0.4$ or $X > 1.6$	Shall be removed and replaced

1/ Does not apply to SMA.

HMA - QUALITY CONTROL FOR PERFORMANCE – LEVELING BINDER JOBSITE SAMPLING **6M19 10/02/12**

Leveling Binder may be sampled from the delivery truck bed at the project site according to the Department's HMA Level I Course Manual and as approved by the Engineer.

MATERIAL TRANSFER DEVICE (BDE)
Effective: June 15, 1999
Revised: August 1, 2014

Description. This work shall consist of placing full-depth HMA mixtures on Illinois Route 104 according to Section 407 of the Standard Specifications, except that these materials shall be placed using a material transfer device (MTD).

Materials and Equipment. The MTD shall have a minimum surge capacity of 15 tons (13.5 metric tons), shall be self-propelled and capable of moving independent of the paver, and shall be equipped with the following:

(a) Front-Dump Hopper and Conveyor. The conveyor shall provide a positive restraint along the sides of the conveyor to prevent material spillage. MTDs having paver style hoppers shall have a horizontal bar restraint placed across the foldable wings which prevents the wings from being folded.

(b) Paver Hopper Insert. The paver hopper insert shall have a minimum capacity of 14 tons (12.7 metric tons).

(c) Mixer/Agitator Mechanism. This re-mixing mechanism shall consist of a segmented, anti-segregation, re-mixing auger or two full-length longitudinal paddle mixers designed for the purpose of re-mixing the hot-mix asphalt (HMA). The longitudinal paddle mixers shall be located in the paver hopper insert.

CONSTRUCTION REQUIREMENTS

General. The MTD shall be used for the placement of all full-depth HMA mixtures on Illinois Route 104 placed with a paver but excluding shoulders. The MTD speed shall be adjusted to the speed of the paver to maintain a continuous, non-stop paving operation.

Use of a MTD with a roadway contact pressure exceeding 25 psi (172 kPa) will be limited to partially completed segments of full-depth HMA pavement where the thickness of binder in place is 10 in. (250 mm) or greater.

Structures. The MTD may be allowed to travel over structures under the following conditions:

(a) Approval will be given by the Engineer.

(b) The vehicle shall be emptied of HMA material prior to crossing the structure and shall travel at crawl speed across the structure.

(c) The tires of the vehicle shall travel on or in close proximity and parallel to the beam and/or girder lines of the structure.

Method of Measurement. This work will be measured for payment in tons (metric tons) for all full-depth HMA materials placed with a material transfer device.

Basis of Payment. This work will be paid for at the contract unit price per ton (metric ton) for MATERIAL TRANSFER DEVICE.

The various HMA mixtures placed with the MTD will be paid for as specified in their respective specifications. The Contractor may choose to use the MTD for other applications on this project; however, no additional compensation will be allowed.

HOT-MIX ASPHALT DRIVEWAY PAVEMENT, 8"

Description. This work shall consist of constructing hot-mix asphalt driveway pavement on a prepared subgrade as shown on the plans and in accordance with Sections 355 and 408 of the Standard Specifications.

Method of Measurement. This work will be measured for payment 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 HOT-MIX ASPHALT DRIVEWAY PAVEMENT, of the thickness specified.

PAVEMENT STATIONING NUMBERS AND PLACEMENT

The Contractor shall provide labor and materials required to imprint pavement station numbers in the finished surface of the pavement and /or overlay. The numbers shall be approximately 20 mm (3/4 inch) wide, 125 mm (5 inches) high and 15 mm (5/8 inch) deep.

The pavement station numbers shall be installed as specified herein:

Interval – 100 meters (metric stationing) or 250 feet (English stationing)

Bottom of Numbers -- 150 mm (6 inches) from the inside edge of the pavement marking and/or resurfacing joint.

Location:

- 2-Lane Pavements – At center line in direction of increasing stations.
- 3 and 5-Lane Pavements – Left edge of center lane in direction of increasing stations.
- Multi-Lane Divided Roadways – Outside edge of pavement in both directions.
- Ramps – Along baseline edge of pavement.

Position – Stations shall be placed so they can be read from the adjacent shoulder.

Format – Metric [English] pavement stations shall use this format (XX+XOO [XO”]) where X represents the pavement station.

This work will not be paid for separately, but will be considered included in the cost of the associated pavement and overlay pay items.

HEAVY DUTY ACCESS GATES

This work shall consist of furnishing all materials, equipment, and labor to install proposed access gates, posts, signs, locks, and accessories, as detailed in the plans and directed by the Engineer.

Single gates will require two latch posts with necessary hardware.

All locks on the project shall be keyed alike.

This work will be paid for at the contract unit price each for ACCESS GATES, DOUBLE or SINGLE, of the total length specified.

TEMPORARY PAVEMENT

This work shall consist of constructing an 8" HMA temporary pavement at the locations shown on the plans or as directed by the engineer.

The contractor shall use 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 HOT-MIX ASPHALT BINDER COURSE, IL 19.0 (8").

The removal of the Temporary Pavement will be considered included in the item cost and shall conform to Section 440 of the Standard Specifications.

Temporary pavement 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 TEMPORARY PAVEMENT.

Removal of temporary pavement will be not be paid separately but included in the contract unit price for TEMPORARY PAVEMENT.

AGGREGATE SURFACE COURSE FOR TEMPORARY ACCESS

Revise Article 402.10 of the Standard Specifications to read:

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

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

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

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

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

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

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

Add the following to Article 402.12 of the Standard Specifications:

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

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

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

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

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

Subject to the approval of the Engineer for the adequate maintenance and removal of the temporary access, the remaining forty percent of the pay item will be paid upon the permanent removal of the temporary access.

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

Description: This work shall consist of constructing combination concrete curb and gutter in accordance with Section 606 of the Standard Specifications, and at the locations and transition dimensions specified on the plans, and as directed by the Engineer.

Curing: The combination concrete curb and gutter shall be cured in accordance with Article 1020.13 of the Standard Specifications.

Method of Measurement: COMBINATION CONCRETE CURB AND GUTTER, TYPE B-9.12 (MODIFIED) shall be measured for payment in feet in the flow line of the gutter and along the face of concrete curb.

Basis of Payment: This work shall be paid for at the contract unit price per foot for COMBINATION CONCRETE CURB AND GUTTER, TYPE B-9.12 (MODIFIED), which price includes payment in full for all labor, tools, equipment, and incidentals required to perform the work as specified herein.

COMBINATION CONCRETE CURB AND GUTTER, TYPE M-6.24 (VARIABLE WIDTH GUTTER FLAG)

Description: This work shall consist of constructing combination concrete curb and gutter in accordance with Section 606 of the Standard Specifications, and at the locations and transition dimensions specified on the plans, and as directed by the Engineer.

Curing: The combination concrete curb and gutter shall be cured in accordance with Article 1020.13 of the Standard Specifications.

Method of Measurement: COMBINATION CONCRETE CURB AND GUTTER, TYPE M-6.24 (VARIABLE WIDTH GUTTER FLAG) shall be measured for payment in feet in the flow line of the gutter and along the face of concrete curb.

Basis of Payment: This work shall be paid for at the contract unit price per foot for COMBINATION CONCRETE CURB AND GUTTER, TYPE M-6.24 (VARIABLE WIDTH GUTTER FLAG), which price includes payment in full for all labor, tools, equipment, and incidentals required to perform the work as specified herein.

REMOVE SIGN COMPLETE

Description: This work shall consist of the complete removal of the signs, supports, and foundations at locations indicated in the plans.

Basis of Payment: This work will be paid for at the unit price each for SIGN REMOVAL.

CONSTRUCTION AND MAINTENANCE SIGN SUPPORTS
Effective: April 21, 1981 Revised: November 1, 2006

This work shall be done according to Section 1106 of the Standard Specifications and Highway Standard 701901 except as herein modified.

All construction signs mounted on permanent support for use in temporary traffic control having an area of 10 square feet (1 square meter) or more shall be mounted on two 4 in x 4 in (100 mm x 100 mm) or two 4 in x 6 in (100 mm x 150 mm) wood posts.

This work shall not be paid for separately; but shall be considered included in the cost of the traffic control items in this contract.

BUILDING REMOVAL – CASE I (NON-FRIABLE AND FRIABLE ASBESTOS ABATEMENT) BDE

Effective: September 1, 1990
Revised: April 1, 2010

BUILDING REMOVAL: This work shall consist of the removal and disposal of 3 building(s), together with all foundations, retaining walls, and piers, down to a plane 1 ft (300 mm) below the ultimate or existing grade in the area and also all incidental and collateral work necessary to complete the removal of the building(s) in a manner approved by the Engineer. Any holes, such as basements, shall be filled with a suitable granular material. The building(s) are identified as follows:

Bldg. No.	Parcel No.	Location	Description
7	6128132	404 Main St. Meredosia, IL	Two-story wood structure with a full basement and an asphalt shingled roof.
14	6128136	522 Main St. Meredosia, IL	Two-story wood and masonry structure with a basement and an asphalt-shinged roof.
17	6128138	622 Main St. Meredosia, IL	Two-story wood structure with a basement and an asphalt-shinged roof.

Discontinuance of Utilities: The Contractor shall arrange for the discontinuance of all utility services and the removal of the metering devices that serve the building(s) according to the respective requirements and regulations of the City, County, or utility companies involved. The Contractor shall disconnect and seal, in an approved manner, all service outlets that serve any building(s) he/she is to remove.

Signs: Immediately upon execution of the contract and prior to the wrecking of any structures, the Contractor shall be required to paint or stencil, in contrasting colors of an oil base paint, on all four sides of each residence and two opposite sides of other structures, the following sign:

PROPERTY ACQUIRED FOR
HIGHWAY CONSTRUCTION
TO BE DEMOLISHED BY THE

VANDALS WILL BE PROSECUTED

The signs shall be positioned in a prominent location on the structure so that they can be easily seen and read and at a sufficient height to prevent defacing. The Contractor shall not paint signs nor start demolition of any building(s) prior to the time that the State becomes the owner of the respective building(s).

All friable asbestos shall be removed from the building(s) prior to demolition. The Contractor has the option of removing the non-friable asbestos prior to demolition or demolishing the building(s) with the non-friable asbestos in place. Refer to the Special Provisions titled "Asbestos Abatement (General Conditions)", "Removal and Disposal of Friable Asbestos Building No. 7, 14, and 17", and "Removal and Disposal of Non-Friable Asbestos Building No. 7, 14, and 17" contained herein.

Basis of Payment: This work will be paid for at the contract lump sum unit price for BUILDING REMOVAL, numbers as listed above, which price shall be payment in full for complete removal of the buildings and structures, including any necessary backfilling material as specified herein. The lump sum unit price(s) for this work shall represent the cost of demolition and disposal assuming all asbestos, friable and non-friable, is removed prior to demolition. Any salvage value shall be reflected in the contract unit price for this item.

EXPLANATION OF BIDDING TERMS: Three separate contract unit price items have been established for the removal of each building. They are:

1. BUILDING REMOVAL NO. 7, 14, and 17

2. REMOVAL AND DISPOSAL OF FRIABLE ASBESTOS, BUILDING NO. 7, 14, and 17

3. REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 7, 14, and 17

The Contractor shall have two options available for the removal and disposal of the non-friable asbestos.

The pay item for removal and disposal of non-friable asbestos will not be deleted regardless of the option chosen by the Contractor.

ASBESTOS ABATEMENT (GENERAL CONDITIONS): This work consists of the removal and disposal of friable and non-friable asbestos from the building(s) to be demolished. All work shall be done according to the requirements of the U.S. Environmental Protection Agency (USEPA), the Illinois Environmental Protection Agency (IEPA), the Occupational Safety and Health Administration (OSHA), the Special Provisions for "Removal and Disposal of Friable Asbestos, Building No. 7, 14, and 17" and "Removal and Disposal of Non-Friable Asbestos, Building No. 7, 14, and 17", and as outlined herein.

Sketches indicating the location of Asbestos Containing Material (ACM) are included in the proposal on pages 51 thru 63. Also refer to the Materials Description Table on pages 64-65 for a brief description and location of the various materials. Also included is a Materials Quantities Table on pages 66-67. This table states whether the ACM is friable or non-friable and gives the approximate quantity. The quantities are given only for information and it shall be the Contractor's responsibility to determine the exact quantities prior to submitting his/her bid.

The work involved in the removal and disposal of friable asbestos, and non-friable asbestos if done prior to demolition, shall be performed by a Contractor or Sub-Contractor prequalified with the Illinois Capital Development Board.

The Contractor shall provide a shipping manifest, similar to the one shown on page 68, to the Engineer for the disposal of all ACM wastes.

Permits: The Contractor shall apply for permit(s) in compliance with applicable regulations of the Illinois Environmental Protection Agency. Any and all other permits required by other federal, state, or local agencies for carrying on the work shall be the responsibility of the Contractor. Copies of these permits shall be sent to the district office and the Engineer.

Notifications: The "Demolition/Renovation Notice" form, which can be obtained from the IEPA office, shall be completed and submitted to the address listed below at least ten days prior to commencement of any asbestos removal or demolition activity. Separate notices shall be sent for the asbestos removal work and the building demolition if they are done as separate operations.

Asbestos Demolition/Renovation Coordinator
Illinois Environmental Protection Agency
Division of Air Pollution Control
P. O. Box 19276
Springfield, Illinois 62794-9276
(217)785-1743

Notices shall be updated if there is a change in the starting date or the amount of asbestos changes by more than 20 percent.

Submittals:

A. All submittals and notices shall be made to the Engineer, except where otherwise specified herein.

B. Submittals that shall be made prior to start of work:

1. Submittals required under Asbestos Abatement Experience.

2. Submit documentation indicating that all employees have had medical examinations and instruction on the hazards of asbestos exposure, on use and fitting of respirators, on protective dress, on use of showers, on entry and exit from work areas, and on all aspects of work procedures and protective measures as specified in Worker Protection Procedures.

3. Submit manufacturer's certification stating that vacuums, ventilation equipment, and other equipment required to contain airborne fibers conform to ANSI 29.2.

4. Submit to the Engineer the brand name, manufacturer, and specification of all sealants or surfactants to be used. Testing under existing conditions will be required at the direction of the Engineer.

5. Submit proof that all required permits, site locations, and arrangements for transport and disposal of asbestos-containing or asbestos-contaminated materials, supplies, and the like have been obtained (i.e., a letter of authorization to utilize designated landfill).

6. Submit a list of penalties, including liquidated damages, incurred through non-compliance with asbestos abatement project specifications.

7. Submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination units, the sequencing of work, the respiratory protection plan to be used during this work, a site safety plan, a disposal plan including the location of an approved disposal site, and a detailed description of the methods to be used to control pollution. The plan shall be submitted to the Engineer prior to the start of work.

8. Submit proof of written notification and compliance with Paragraph "Notifications".

C. Submittals that shall be made upon completion of abatement work:

1. Submit copies of all waste chain-of-custodies, trip tickets, and disposal receipts for all asbestos waste materials removed from the work area;

2. Submit daily copies of work site entry logbooks with information on worker and visitor access;

3. Submit logs documenting filter changes on respirators, HEPA vacuums, negative pressure ventilation units, and other engineering controls; and

4. Submit results of any bulk material analysis and air sampling data collected during the course of the abatement including results of any on-site testing by any federal, state, or local agency.

Certificate of Insurance:

A. The Contractor shall document general liability insurance for personal injury, occupational disease and sickness or death, and property damage.

B. The Contractor shall document current Workmen's Compensation Insurance coverage.

C. The Contractor shall supply insurance certificates as specified by the Department.

Asbestos Abatement Experience:

A. Company Experience: Prior to starting work, the Contractor shall supply evidence that he/she has been prequalified with the Illinois Capital Development Board and that he/she has been included on the Illinois Department of Public Health's list of approved Contractors.

B. Personnel Experience:

1. For Superintendent, the Contractor shall supply:

a. Evidence of knowledge of applicable regulations in safety and environmental protection is required as well as training in asbestos abatement as evidenced by the successful completion of a training course in supervision of asbestos abatement as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to the Engineer prior to the start of work.

b. Documentation of experience with abatement work in a supervisory position as evidenced through supervising at least two asbestos abatement projects; provide names, contact, phone number, and locations of two projects in which the individual(s) has worked in a supervisory capacity.

2. For workers involved in the removal of friable and non-friable asbestos, the Contractor shall provide training as evidenced by the participation and successful completion of an accredited training course for asbestos abatement workers as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to all employees who will be working on this project.

ABATEMENT AIR MONITORING: The Contractor shall comply with the following:

A. Personal Monitoring: All personal monitoring shall be conducted per specifications listed in OSHA regulation, Title 29, Code of Federal Regulation 1926.58. All area sampling shall be conducted according to 40 CFR Part 763.90. All air monitoring equipment shall be calibrated and maintained in proper operating condition. Excursion limits shall be monitored daily. Personal monitoring is the responsibility of the Contractor. Additional personal samples may be required by the Engineer at any time during the project.

B. Contained Work Areas for Removal of Friable Asbestos: Area samples shall be collected for the department within the work area daily. A minimum of one sample shall be taken outside of the abatement area removal operations. The Engineer will also have the option to require additional personal samples and/or clearance samples during this type of work.

C. Interior Non-Friable Asbestos-Containing Materials: The Contractor shall perform personal air monitoring during removal of all nonfriable Transite and floor tile removal operations. The Engineer will also have the option to require additional personal samples and/or clearance samples during this type of work.

D. Exterior Non-Friable Asbestos-Containing Materials: The Contractor shall perform personal air monitoring during removal of all nonfriable cementitious panels, piping, roofing felts, and built up roofing materials that contain asbestos.

The Contractor shall conduct down wind area sampling to monitor airborne fiber levels at a frequency of no less than three per day.

E. Air Monitoring Professional

1. All air sampling shall be conducted by a qualified Air Sampling Professional supplied by the Contractor. The Air Sampling Professional shall submit documentation of successful completion of the National Institute for Occupational Safety and Health (NIOSH) course #582 - "Sampling and Evaluating Airborne Asbestos Dust".

2. Air sampling shall be conducted according to NIOSH Method 7400. The results of these tests shall be provided to the Engineer within 24 hours of the collection of air samples.

REMOVAL AND DISPOSAL OF FRIABLE ASBESTOS, BUILDING NO. 7, 14, and 17: This work consists of the removal and disposal of all friable asbestos from the building(s) prior to demolition. The work shall be done according to the Special Provision titled "Asbestos Abatement (General Conditions)" and as outlined herein.

This work will be paid for at the contract unit price per lump sum for REMOVAL AND DISPOSAL OF FRIABLE ASBESTOS, BUILDING NO. 7, 14, and 17, as shown, which price shall include furnishing all labor, materials, equipment and services required to remove and dispose of the friable asbestos.

REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 7, 14, and 17: The Contractor has the option of removing and disposing of the non-friable asbestos prior to demolition of the building(s) or demolishing the building(s) with the non-friable asbestos in place.

Option #1 - If the Contractor chooses to remove all non-friable asbestos prior to demolition, the work shall be done according to the Special Provision titled "Asbestos Abatement (General Conditions)".

Option #2 - If the Contractor chooses to demolish the building(s) with the non-friable asbestos in place, the following provisions shall apply:

1. Continuously wet all non-friable ACM and other building debris with water during demolition.

2. Dispose of all demolition debris as asbestos containing material by placing it in lined, covered transport haulers and placing it in an approved landfill.

This work will be paid for at the contract unit price per lump sum for REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 7, 14, and 17, as shown.

The cost for this work shall be determined as follows:

Option #1 - Actual cost of removal and disposal of non-friable asbestos.

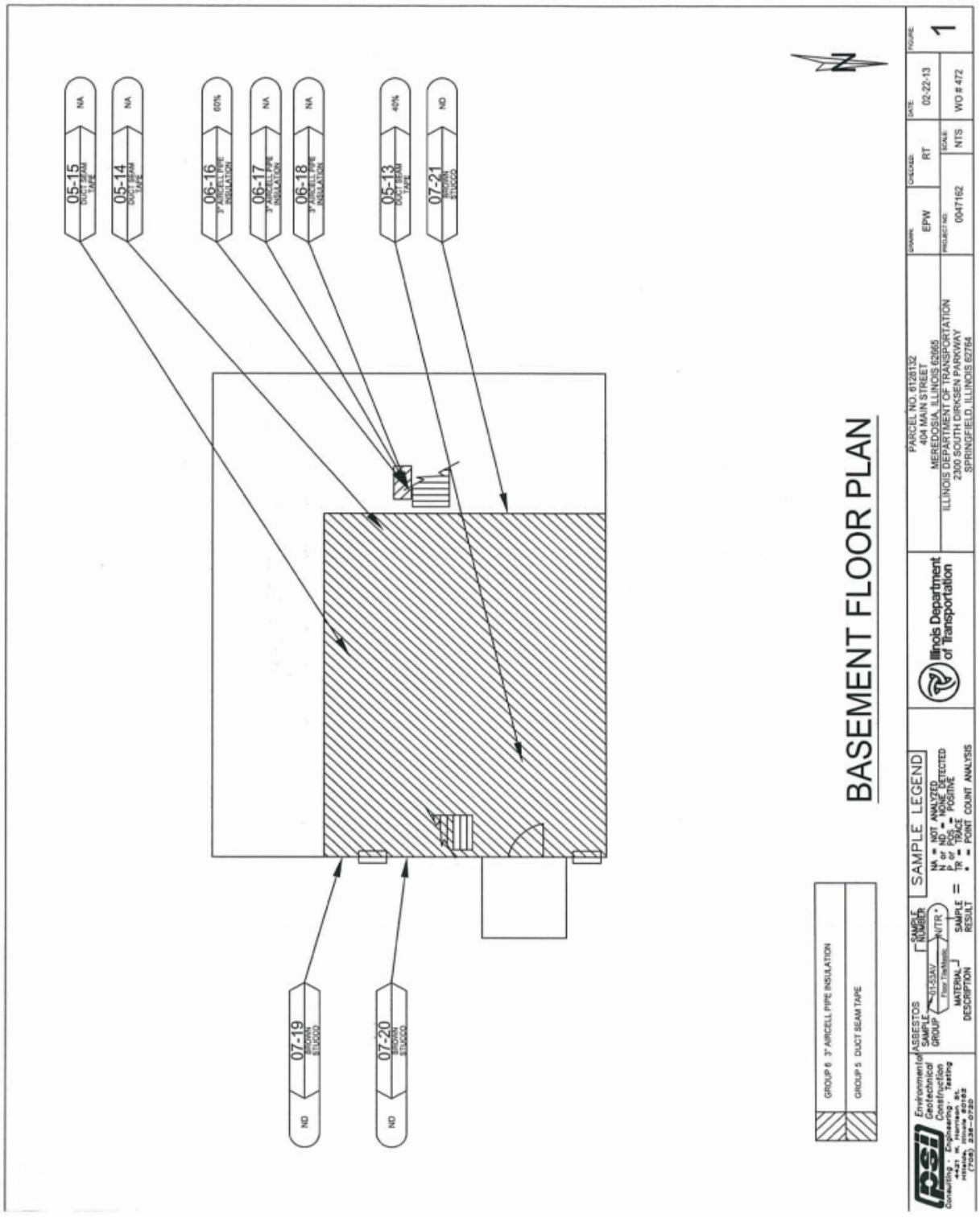
Option #2 - The difference in cost between removing and disposing of the building if all non-friable asbestos is left in place and removing and disposing of the building assuming all non-friable asbestos is removed prior to demolition.

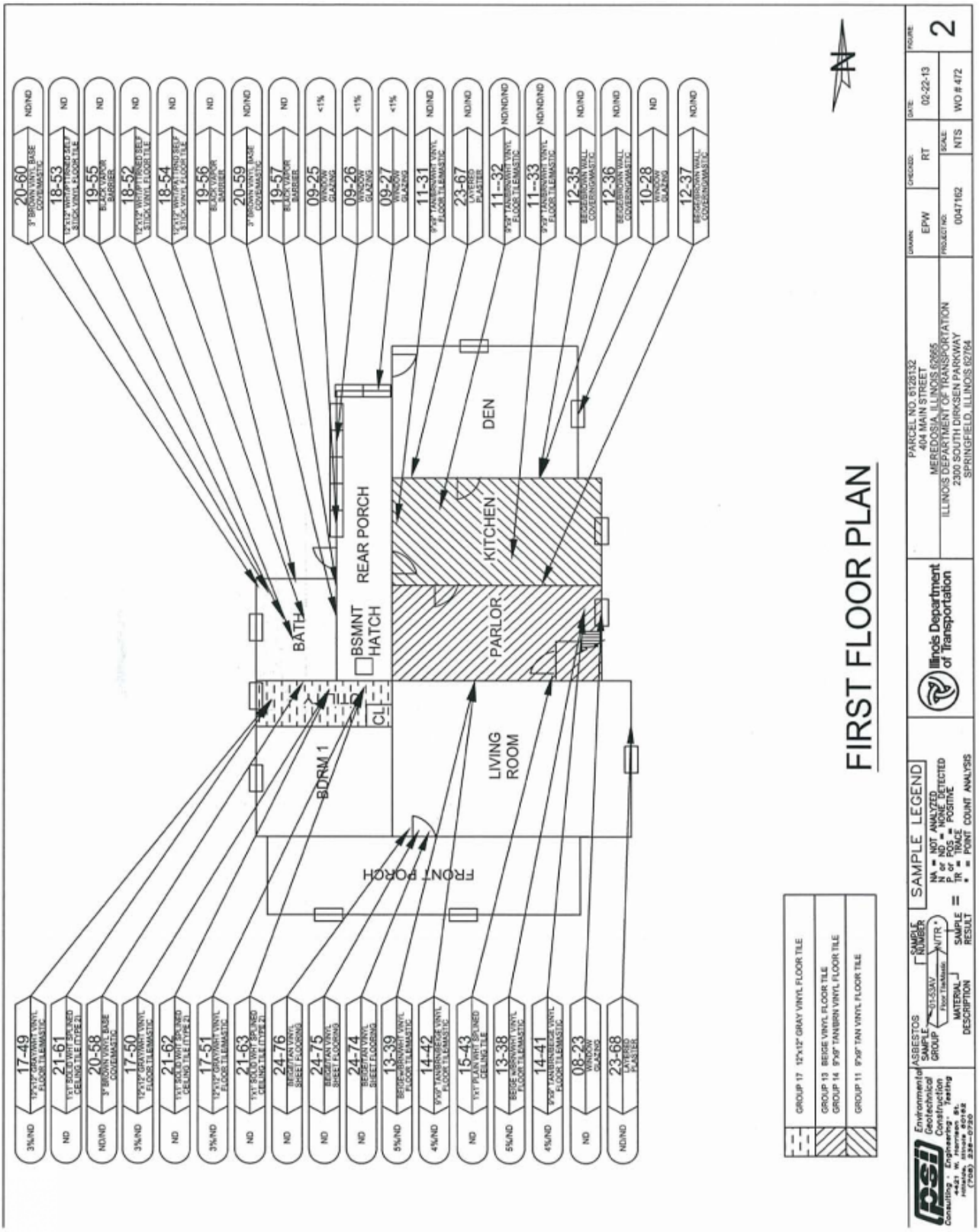
The cost of removing and disposing of the building(s), assuming all asbestos, friable and non-friable is removed first, shall be represented by the pay item "BUILDING REMOVAL NO. 7, 14, and 17".

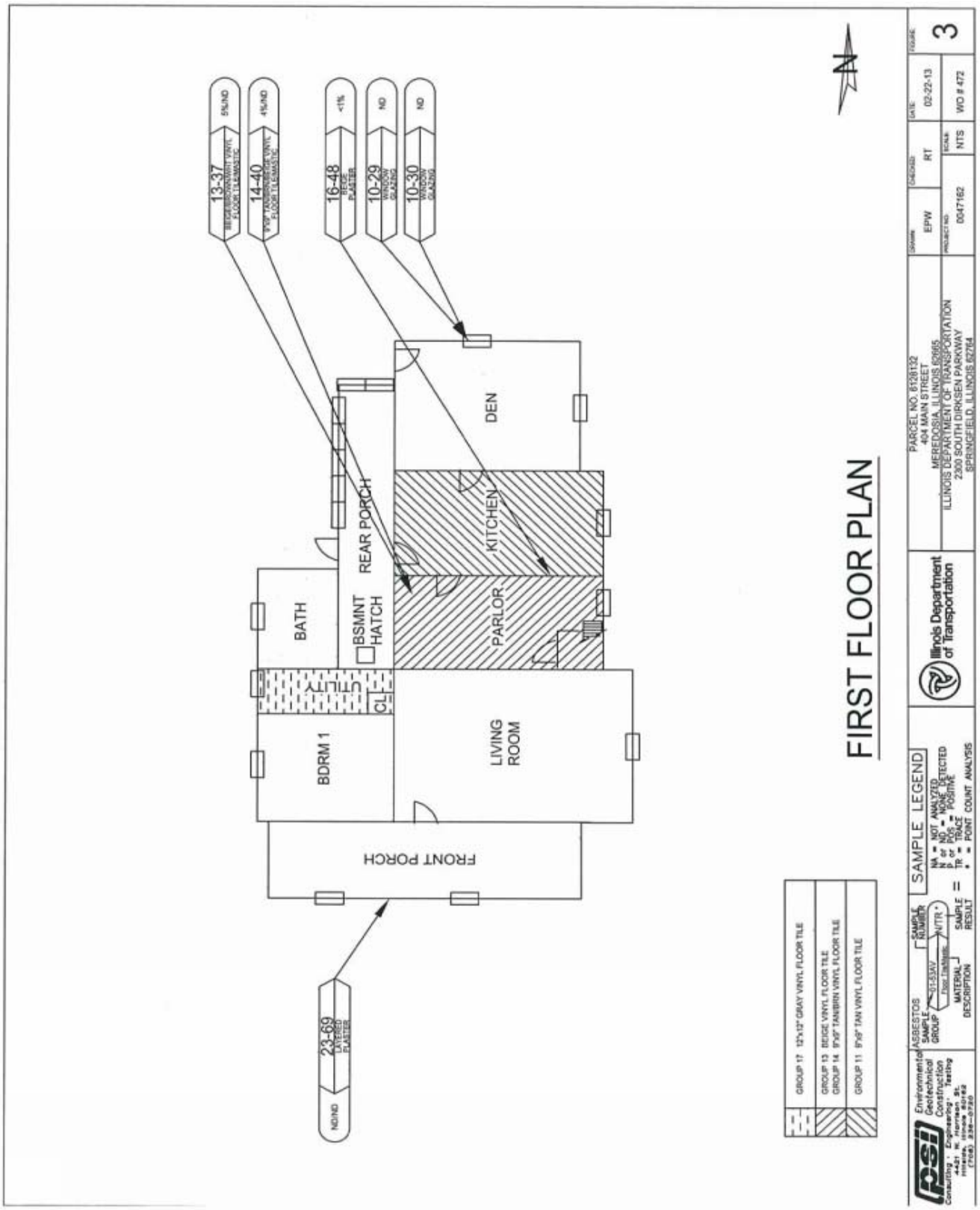
Regardless of the option chosen by the Contractor, this pay item will not be deleted, nor will the pay item BUILDING REMOVAL NO. 7, 14, and 17 be deleted.

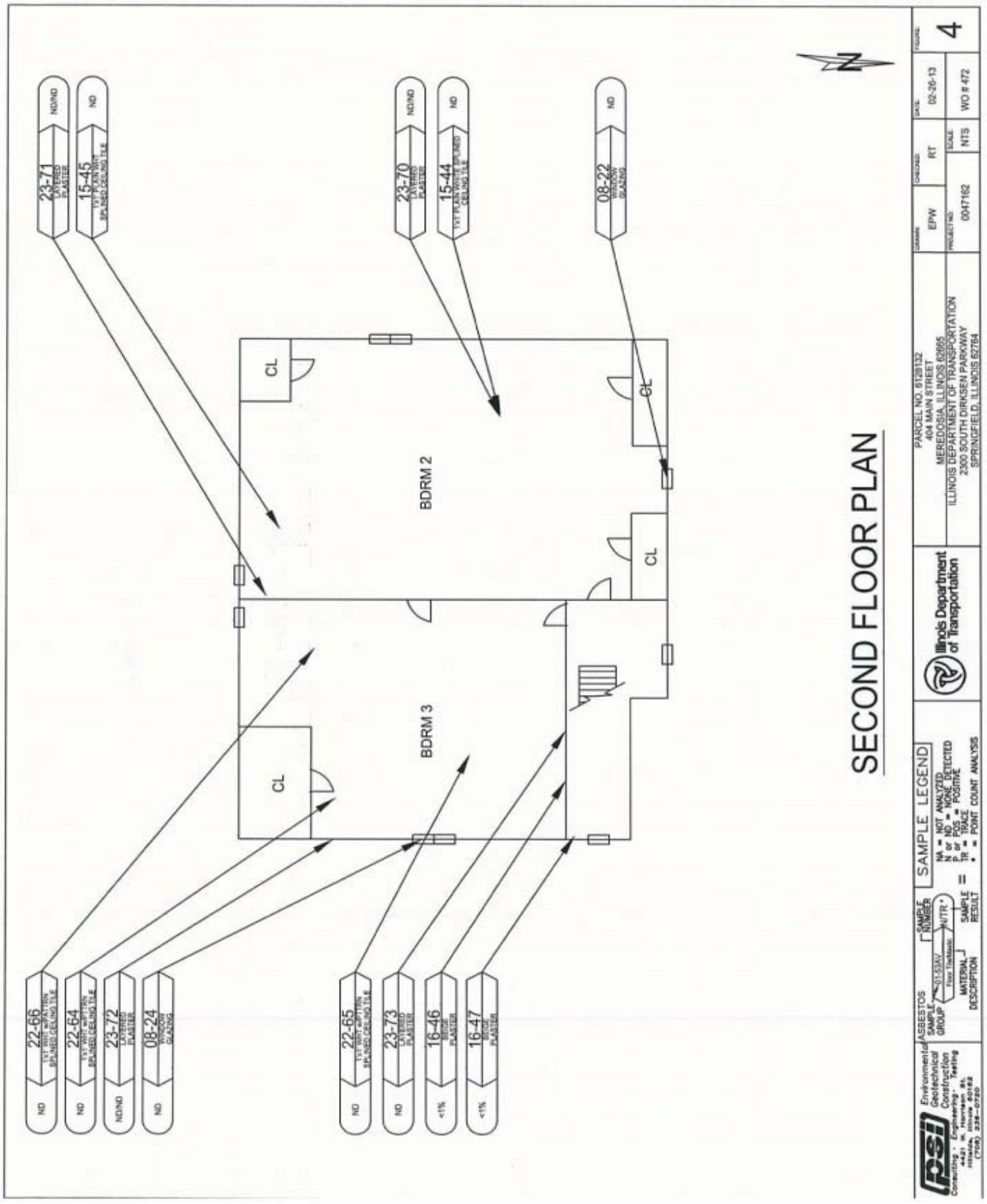
APPENDIX A

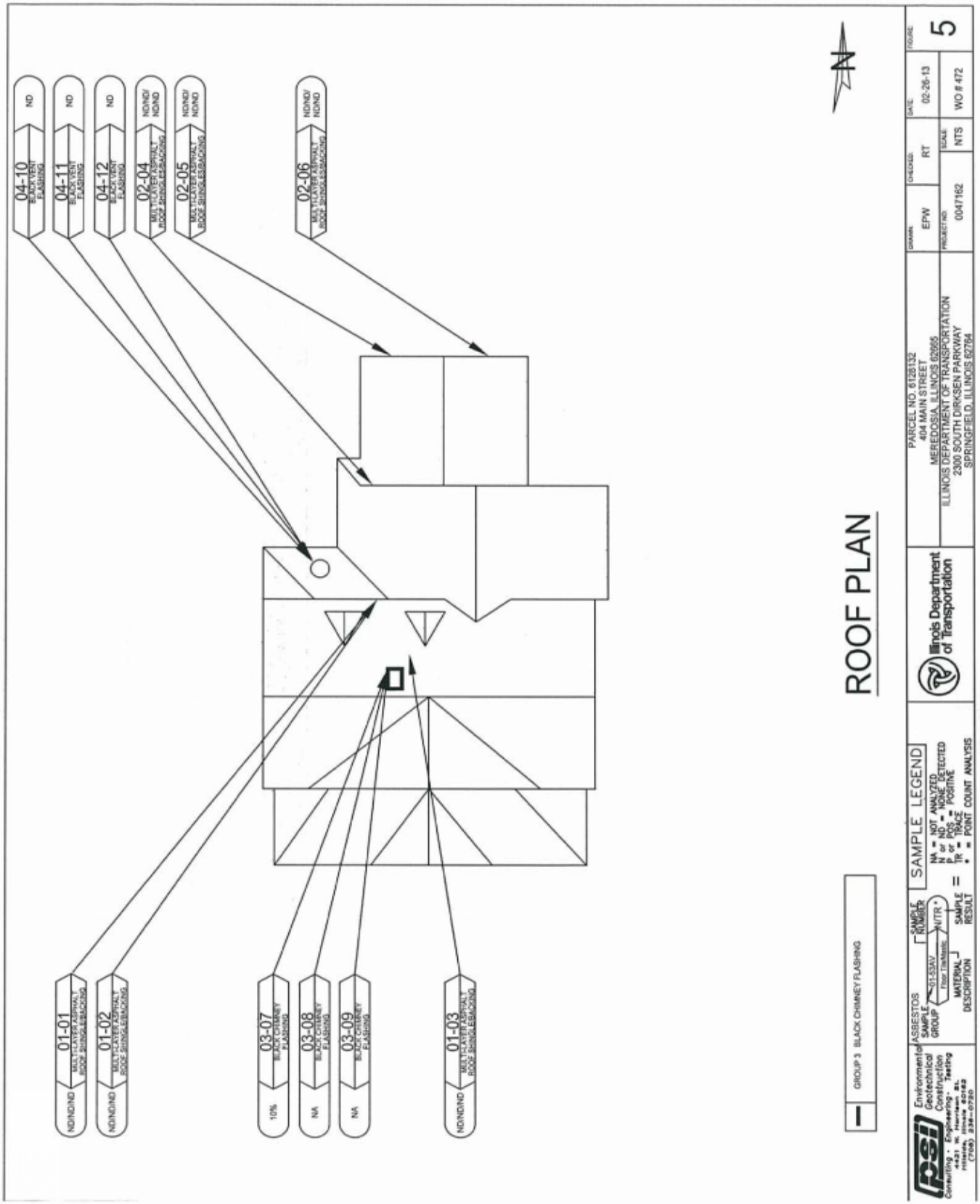
SKETCHES OF BUILDING NO. 7, 14, and 17

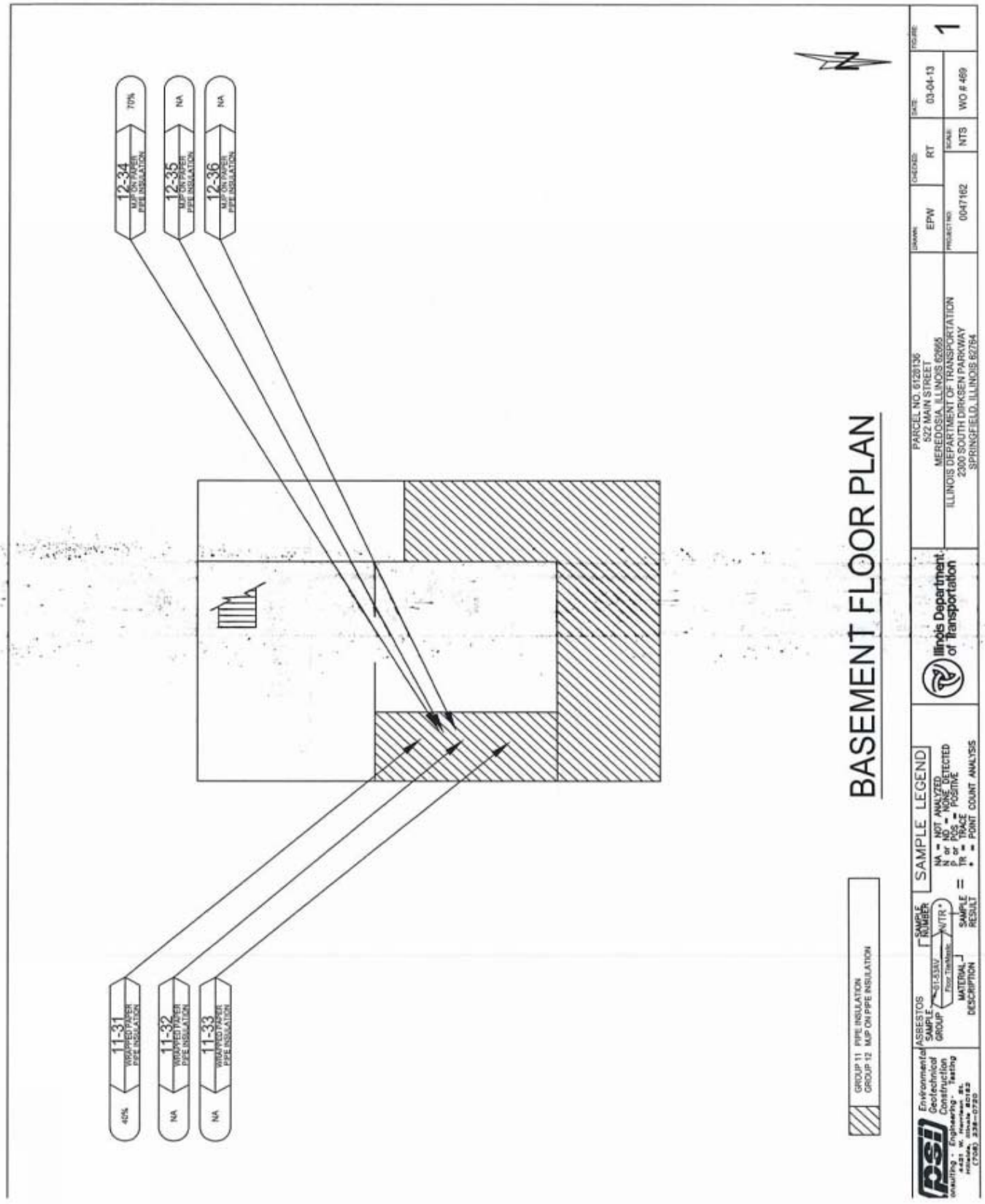


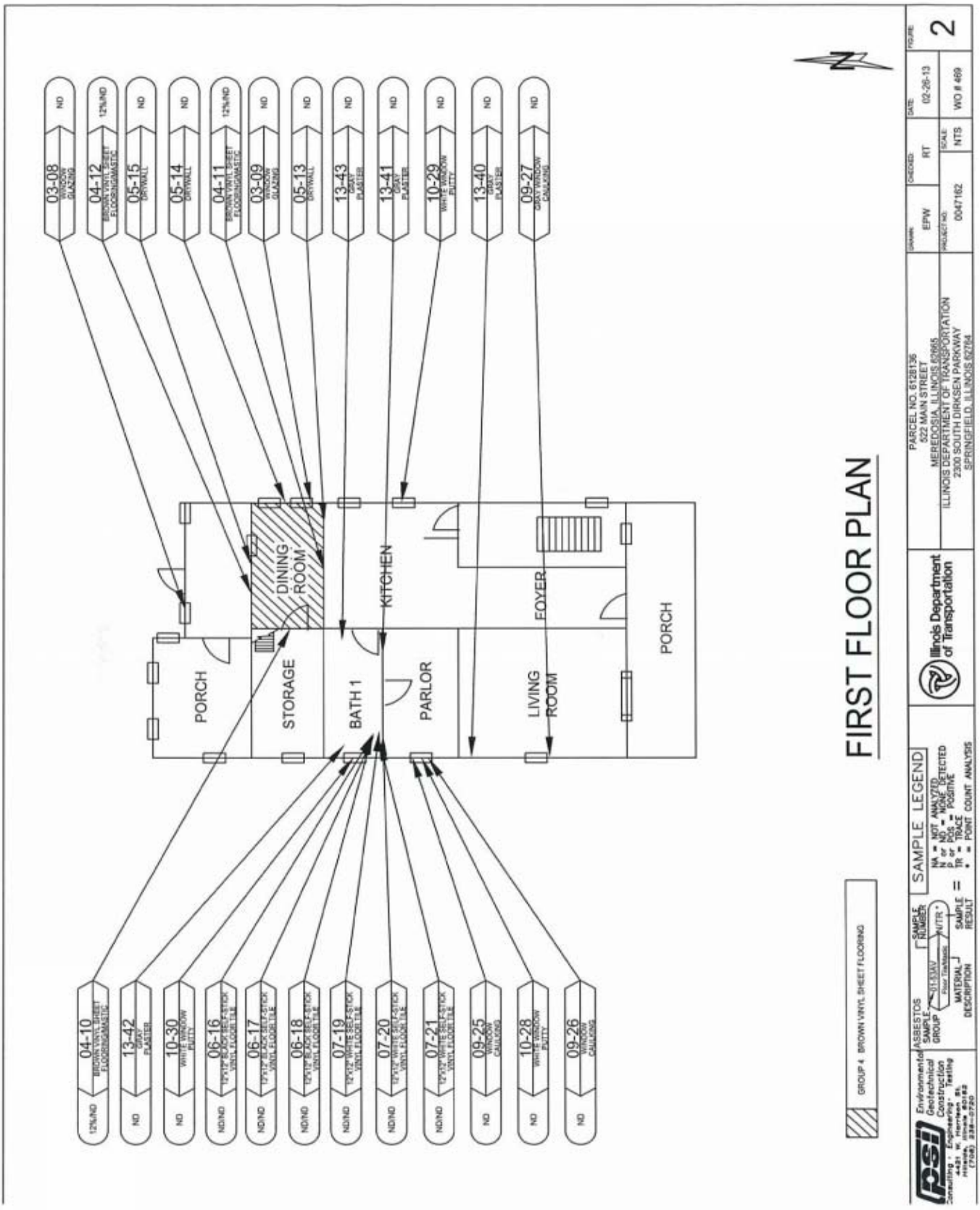

FIRST FLOOR PLAN
BATH
BSMNT HATCH
REAR PORCH
DEN
KITCHEN
PARLOR
LIVING ROOM
BDRM 1
FRONT PORCH
SAMPLE LEGEND
ASBESTOS SAMPLE GROUP
SAMPLE NUMBER
MATERIAL DESCRIPTION
SAMPLE RESULT
NA = NOT ANALYZED
ND = NONE DETECTED
P or POS = POSITIVE
TR = TRACE
* = POINT COUNT ANALYSIS
GROUP 17 12"x12" GRAY VINYL FLOOR TILE
GROUP 13 BEIGE VINYL FLOOR TILE
GROUP 14 9"x9" TAN/BRN VINYL FLOOR TILE
GROUP 11 9"x9" TAN VINYL FLOOR TILE
PARCEL NO. 6126132
404 MAIN STREET
MEREDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
Illinois Department of Transportation
DRAWN: EPW
CHECKED: RT
DATE: 02-22-13
PROJECT NO: 0047162
SCALE: NTS
WO # 472
FIGURE 2
Environmental Geotechnical Construction Consulting · Engineering · Testing
4421 w. harrison st. chicago, il 60624 (708) 338-0720

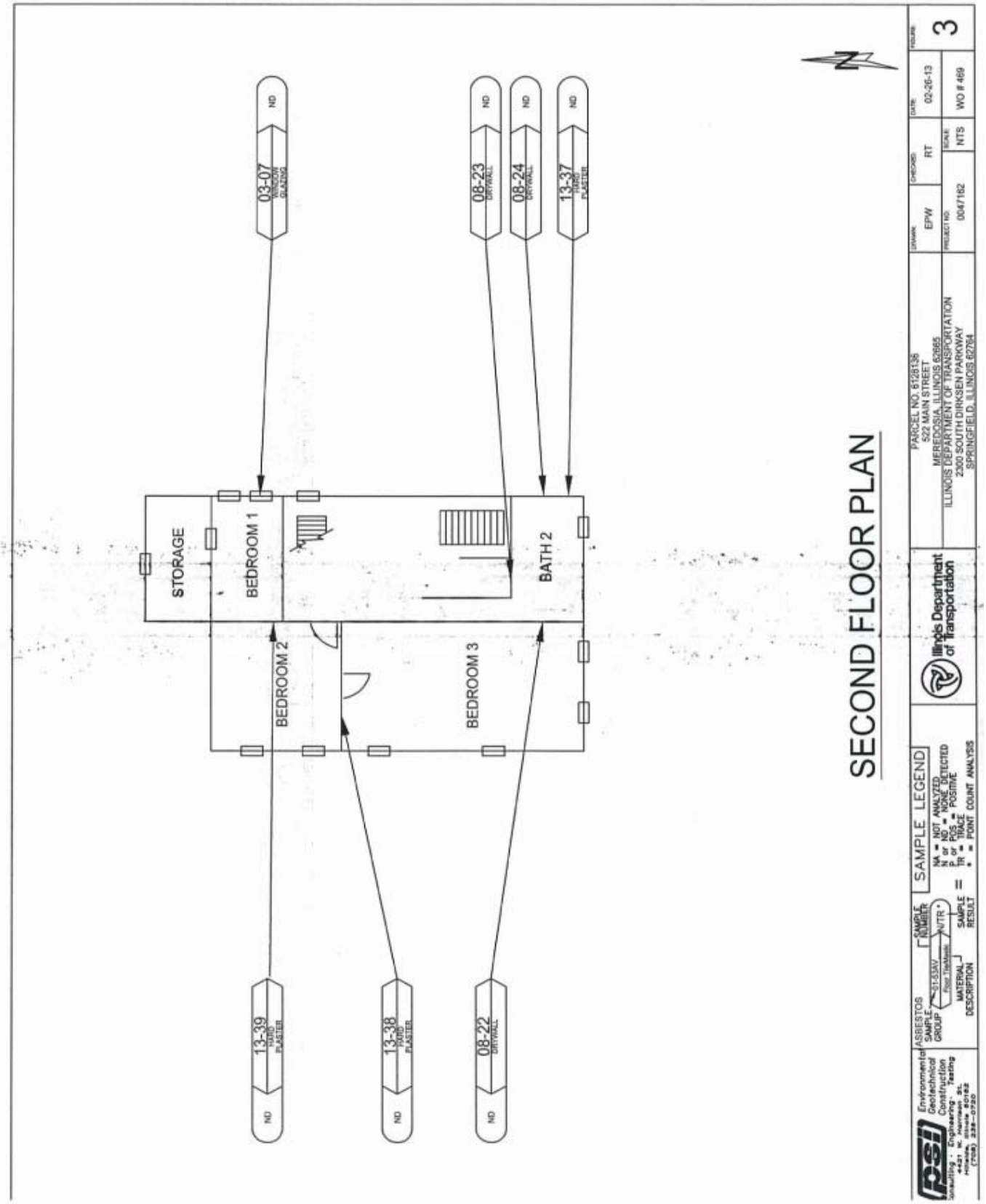

13-37
5%ND
14-40
4%ND
16-48
<1%
10-29
ND
10-30
ND
23-69
ND/ND
DEN
KITCHEN
REAR PORCH
BSMNT HATCH
BATH
PARLOR
BDRM 1
LIVING ROOM
FRONT PORCH
N
FIRST FLOOR PLAN
PARCEL NO. 6128122
404 MAIN STREET
MERIDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
Illinois Department of Transportation
SAMPLE LEGEND
GROUP 17 12"x12" GRAY VINYL FLOOR TILE
GROUP 13 BEIGE VINYL FLOOR TILE
GROUP 14 9"x9" TAN/BRN VINYL FLOOR TILE
GROUP 11 9"x9" TAN VINYL FLOOR TILE
Environmental Geotechnical Construction Testing
EPW
RT
0047162
NTS
02-22-13
WO # 472
3

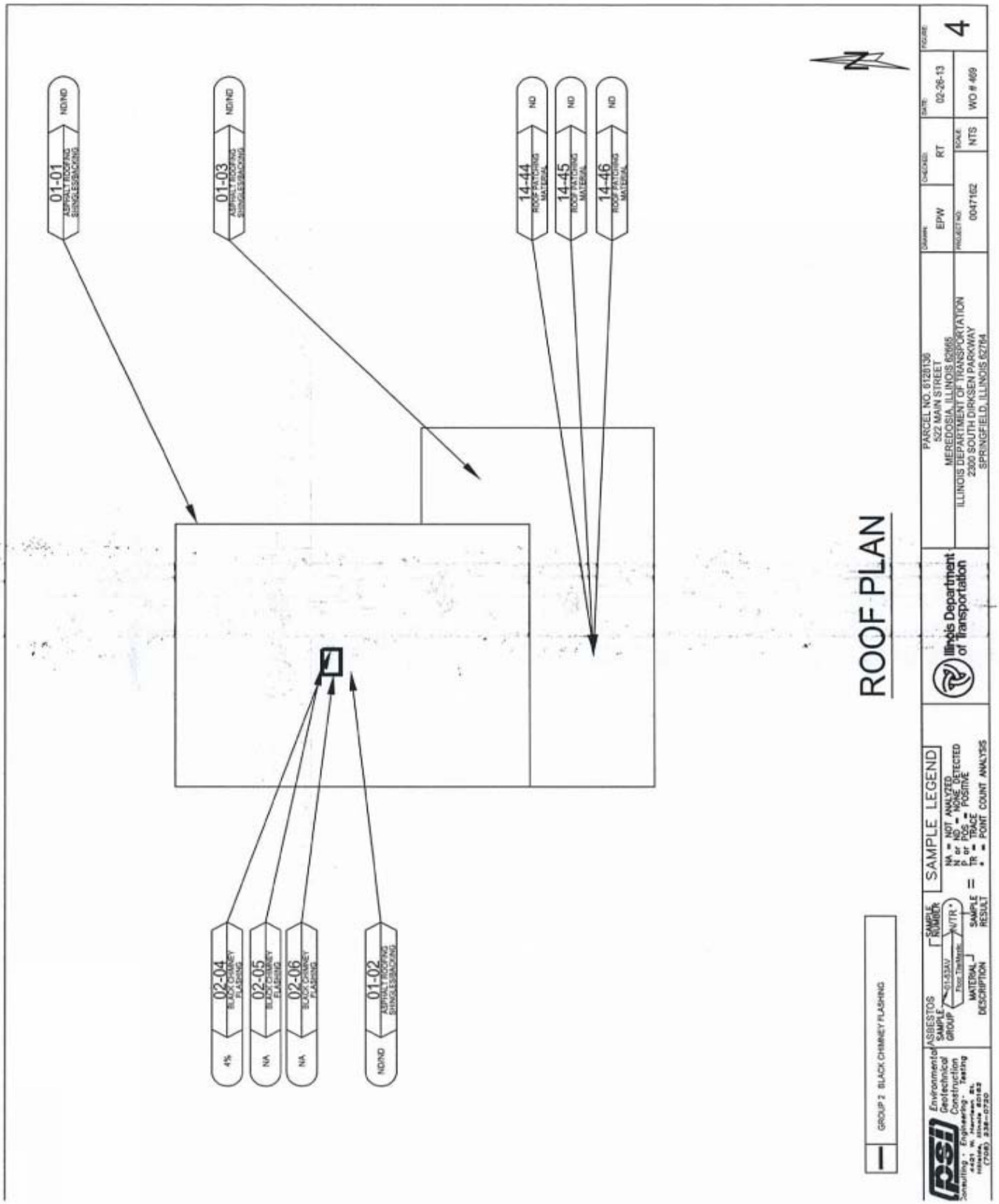

SECOND FLOOR PLAN
BDRM 2
BDRM 3
CL
N
23-71 LAYERED PLASTER ND/ND
15-45 1'X1' PLAIN WHITE SPLINED CEILING TILE ND
23-70 LAYERED PLASTER ND/ND
15-44 1'X1' PLAIN WHITE SPLINED CEILING TILE ND
08-22 WINDOW GLAZING ND
22-66 1'X1' PLAIN WHITE SPLINED CEILING TILE ND
22-64 1'X1' PLAIN WHITE SPLINED CEILING TILE ND
23-72 LAYERED PLASTER ND/ND
08-24 WINDOW GLAZING ND
22-65 1'X1' PLAIN WHITE SPLINED CEILING TILE ND
23-73 LAYERED PLASTER ND
16-46 BRICK PLASTER <1%
16-47 BRICK PLASTER <1%
SAMPLE LEGEND
NA = NOT ANALYZED
ND = NONE DETECTED
N or POS = POSITIVE
TR = TRACE
* = POINT COUNT ANALYSIS
Illinois Department of Transportation
PARCEL NO. 6128132
404 MAIN STREET
MEREDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
DRAWN EPW
CHECKED RT
DATE 02-26-13
PROJECT NO 0047162
SCALE NTS
WO # 472
FIGURE 4
PSI Environmental Geotechnical Construction Consulting Engineering Testing
4421 N. Harrison St. Hillside, Illinois 60162 (708) 236-0720

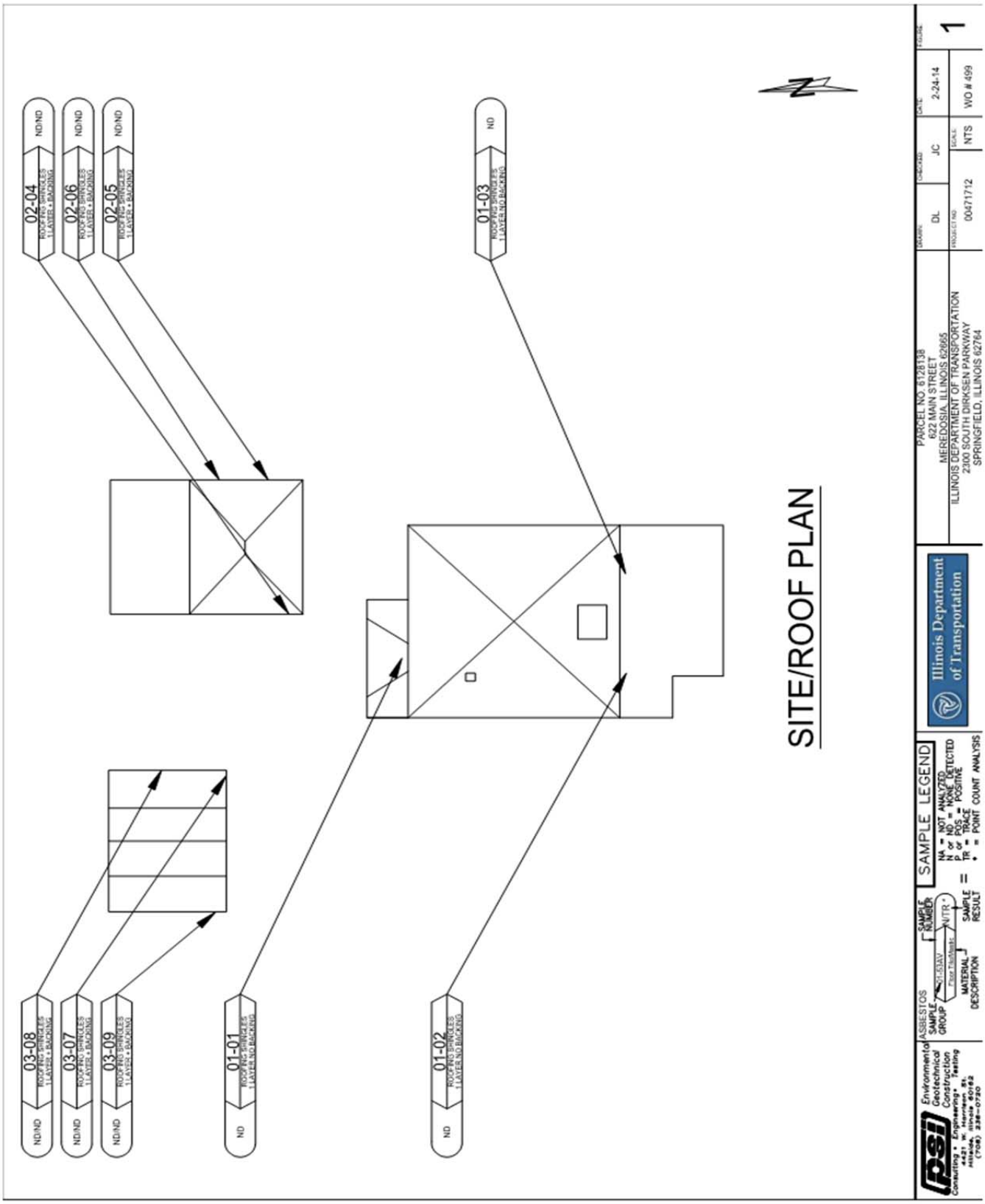

ROOF PLAN
SAMPLE LEGEND
GROUP 3 BLACK CHIMNEY FLASHING
Illinois Department of Transportation
PARCEL NO. 6128132
404 MAIN STREET
MEREDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
EPW
RT
0047162
NTS
02-26-13
WO # 472
5

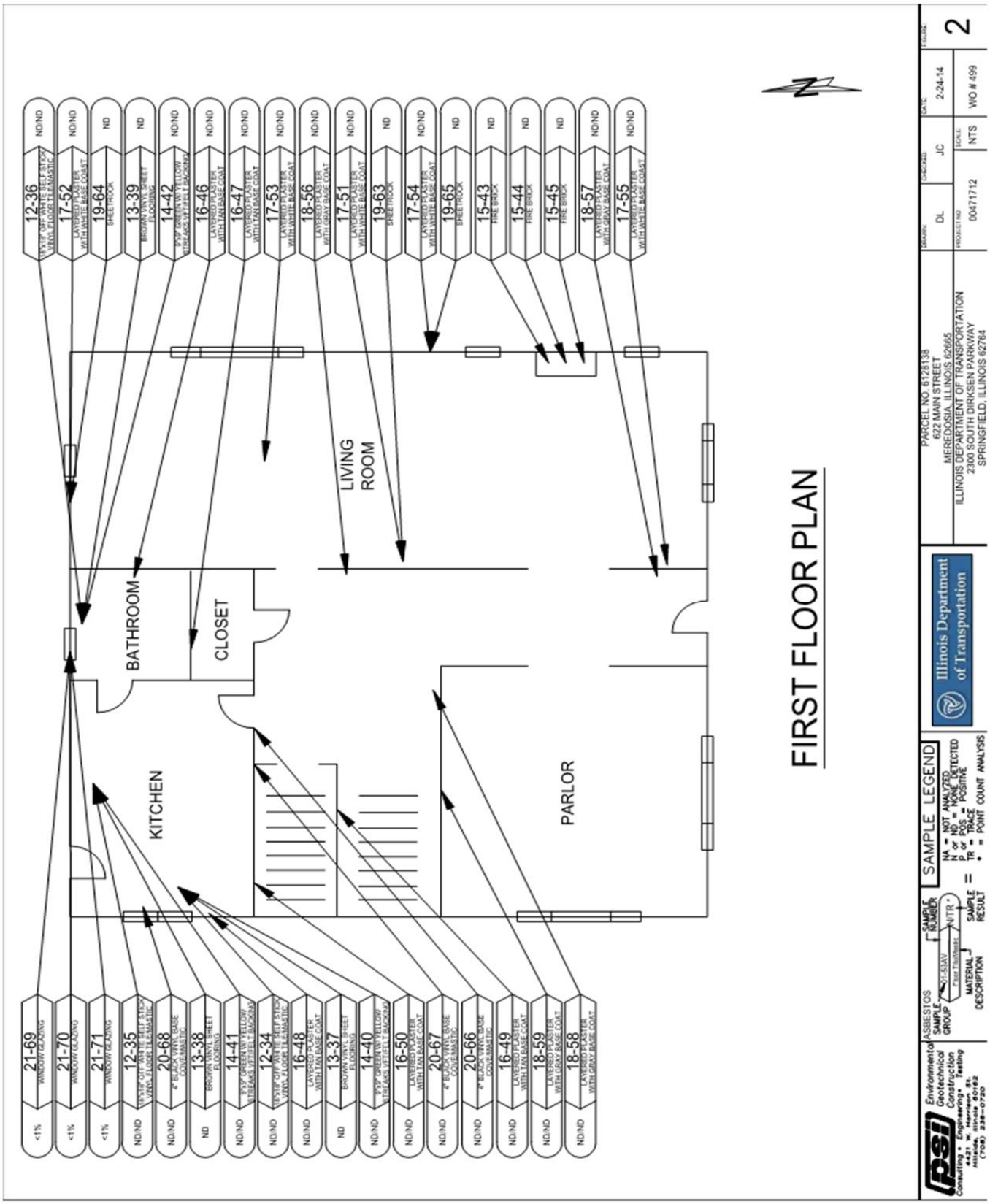

BASEMENT FLOOR PLAN
N
12-34
70%
12-35
NA
12-36
NA
11-31
40%
11-32
NA
11-33
NA
GROUP 11 PIPE INSULATION
GROUP 12 M&P ON PIPE INSULATION
SAMPLE LEGEND
NA = NOT ANALYZED
N or NO = NONE DETECTED
P or YES = POSITIVE
TR = TRACE
* = POINT COUNT ANALYSIS
ASBESTOS
SAMPLE GROUP
SAMPLE NUMBER
MATERIAL DESCRIPTION
SAMPLE RESULT
Illinois Department of Transportation
PARCEL NO. 6128136
522 MAIN STREET
MERIDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
DRAWN EPW
CHECKED RT
DATE 03-04-13
PROJECT NO 0047162
SCALE NTS
WO # 469
FIGURE 1

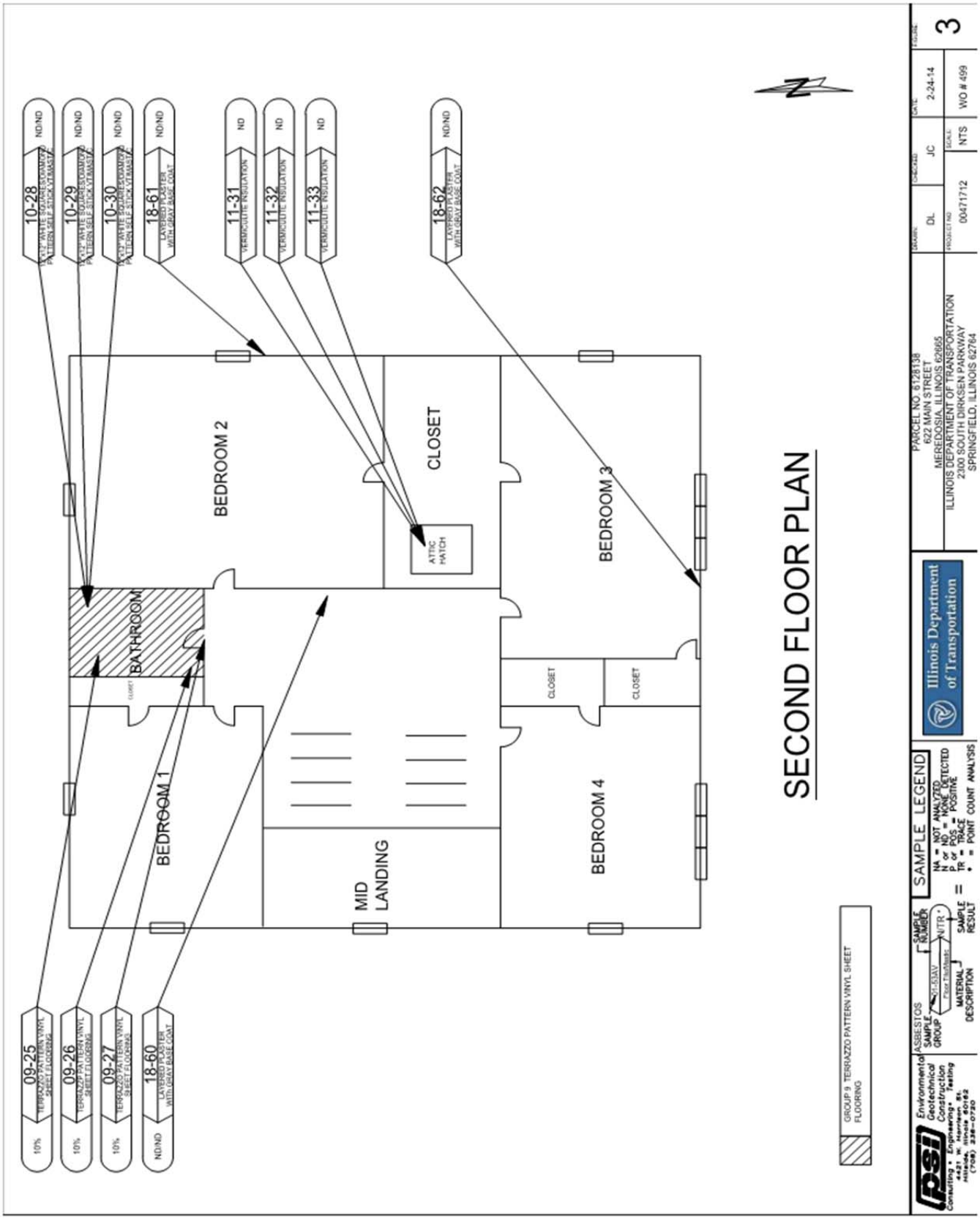

FIRST FLOOR PLAN
PORCH
STORAGE
BATH 1
PARLOR
DINING ROOM
KITCHEN
FOYER
LIVING ROOM
PORCH
03-08 ND WINDOW GLAZING
04-12 12%ND BROWN VINYL SHEET FLOORING/MASTIC
05-15 ND DRYWALL
05-14 ND DRYWALL
04-11 12%ND BROWN VINYL SHEET FLOORING/MASTIC
03-09 ND WINDOW GLAZING
05-13 ND DRYWALL
13-43 ND GRAY PLASTER
13-41 ND GRAY PLASTER
10-29 ND WHITE WINDOW PUTTY
13-40 ND GRAY PLASTER
09-27 ND GRAY WINDOW CAULKING
04-10 12%ND BROWN VINYL SHEET FLOORING/MASTIC
13-42 ND GRAY PLASTER
10-30 ND WHITE WINDOW PUTTY
06-16 ND/ND 12"X12" BLACK SELF-STICK VINYL FLOOR TILE
06-17 ND/ND 12"X12" BLACK SELF-STICK VINYL FLOOR TILE
06-18 ND/ND 12"X12" BLACK SELF-STICK VINYL FLOOR TILE
07-19 ND/ND 12"X12" WHITE SELF-STICK VINYL FLOOR TILE
07-20 ND/ND 12"X12" WHITE SELF-STICK VINYL FLOOR TILE
07-21 ND/ND 12"X12" WHITE SELF-STICK VINYL FLOOR TILE
09-25 ND WINDOW CAULKING
10-28 ND WHITE WINDOW PUTTY
09-26 ND WINDOW CAULKING
GROUP 4 BROWN VINYL SHEET FLOORING
SAMPLE LEGEND
ASBESTOS SAMPLE GROUP
SAMPLE NUMBER
MATERIAL DESCRIPTION
SAMPLE RESULT
NA = NOT ANALYZED
N or ND = NONE DETECTED
P or POS = POSITIVE
Tr = TRACE
* = POINT COUNT ANALYSIS
PARCEL NO. 6126136
522 MAIN STREET
MERIDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
Illinois Department of Transportation
DRAWN EPW
CHECKED RT
DATE 02-26-13
PROJECT NO. 0047162
SCALE NTS
WO # 469
FIGURE 2
Environmental Geotechnical Construction Engineering Testing

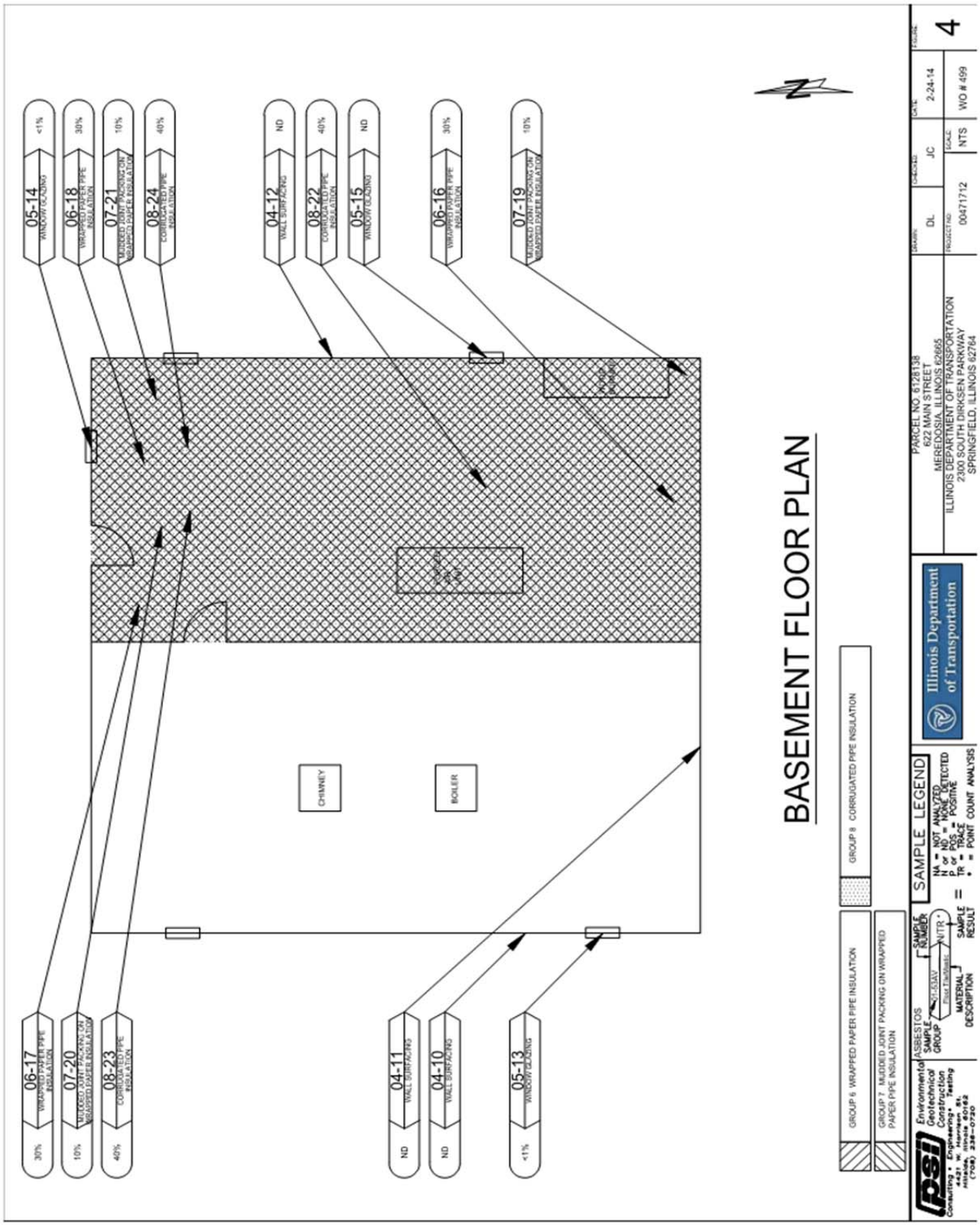

SECOND FLOOR PLAN
STORAGE
BEDROOM 1
BEDROOM 2
BEDROOM 3
BATH 2
03-07
08-23
08-24
13-37
13-39
13-38
08-22
ND
SAMPLE LEGEND
Illinois Department of Transportation
PARCEL NO. 6126135
522 MAIN STREET
MERIDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
EPW
RT
02-26-13
NTS
WO # 469
3


ROOF PLAN
01-01 ASPHALT ROOFING SHINGLES/BACKING ND/ND
01-03 ASPHALT ROOFING SHINGLES/BACKING ND/ND
14-44 ROOF PATCHING MATERIAL ND
14-45 ROOF PATCHING MATERIAL ND
14-46 ROOF PATCHING MATERIAL ND
02-04 BLOCK CHIMNEY FLASHING 4%
02-05 BLOCK CHIMNEY FLASHING NA
02-06 BLOCK CHIMNEY FLASHING NA
01-02 ASPHALT ROOFING SHINGLES/BACKING ND/ND
GROUP 2 BLACK CHIMNEY FLASHING
SAMPLE LEGEND
NA = NOT ANALYZED
N or ND = NONE DETECTED
P or POS = POSITIVE
TR = TRACE
* = POINT COUNT ANALYSIS
PARCEL NO. 6128136
522 MAIN STREET
MERIDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
Illinois Department of Transportation
DRAWN EPW
CHECKED RT
DATE 02-26-13
PROJECT NO. 0047102
SCALE NTS
WO # 469
FIGURE 4
Environmental Geotechnical Construction
Consulting · Engineering · Testing
(708) 236-0720


SITE/ROOF PLAN
02-04
ROOFING SHINGLES 1 LAYER + BACKING
ND/ND
02-06
ROOFING SHINGLES 1 LAYER + BACKING
ND/ND
02-05
ROOFING SHINGLES 1 LAYER + BACKING
ND/ND
01-03
ROOFING SHINGLES 1 LAYER NO BACKING
ND
03-08
ROOFING SHINGLES 1 LAYER + BACKING
ND/ND
03-07
ROOFING SHINGLES 1 LAYER + BACKING
ND/ND
03-09
ROOFING SHINGLES 1 LAYER + BACKING
ND/ND
01-01
ROOFING SHINGLES 1 LAYER NO BACKING
ND
01-02
ROOFING SHINGLES 1 LAYER NO BACKING
ND
SAMPLE LEGEND
SAMPLE NUMBER
MATERIAL DESCRIPTION
SAMPLE RESULT
NA = NOT ANALYZED
ND = NONE DETECTED
N or P = POSITIVE
TR = TRACE
* = POINT COUNT ANALYSIS
ASBESTOS SAMPLE GROUP
PARCEL NO. 6128138
622 MAIN STREET
MEREDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
Illinois Department of Transportation
DRAWN: DL
CHECKED: JC
DATE: 2-24-14
PROJECT NO: 00471712
SCALE: NTS
WO # 499
FIGURE: 1
Environmental Geotechnical Construction Testing
Consulting • Engineering • Testing
4421 W. Harrison St.
Hillside, Illinois 60162
(708) 236-0720


FIRST FLOOR PLAN
LIVING ROOM
BATHROOM
CLOSET
KITCHEN
PARLOR
SAMPLE LEGEND
ASBESTOS
PARCEL NO. 6128138
622 MAIN STREET
MERREDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
Illinois Department of Transportation
2-24-14
WO # 499
NTS
00471712
JC
DL


SECOND FLOOR PLAN
BEDROOM 1
BEDROOM 2
BEDROOM 3
BEDROOM 4
BATHROOM
CLOSET
MID LANDING
ATTIC HATCH
10-28
10-29
10-30
18-61
11-31
11-32
11-33
18-62
09-25
09-26
09-27
18-60
GROUP 9 TERRAZZO PATTERN VINYL SHEET FLOORING
SAMPLE LEGEND
PARCEL NO 6128138
622 MAIN STREET
MEREDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
Illinois Department of Transportation
PSI
Environmental
Geotechnical
Construction
Consulting • Engineering • Testing
4421 W. Harrison St.
Hillside, Illinois 60162
(708) 236-0720
DRAWN: DL
CHECKED: JC
DATE: 2-24-14
PROJECT NO: 00471712
SCALE: NTS
WO # 499
FIGURE: 3


BASEMENT FLOOR PLAN
05-14 <1%
06-18 30%
07-21 10%
08-24 40%
04-12 ND
08-22 40%
05-15 ND
06-16 30%
07-19 10%
06-17 30%
07-20 10%
08-23 40%
04-11 ND
04-10 ND
05-13 <1%
CHIMNEY
BOILER
FURNACE
GROUP 6 WRAPPED PAPER PIPE INSULATION
GROUP 8 CORRUGATED PIPE INSULATION
GROUP 7 MUDDED JOINT PACKING ON WRAPPED PAPER PIPE INSULATION
SAMPLE LEGEND
NA = NOT ANALYZED
N or ND = NONE DETECTED
P or POS = POSITIVE
TR = TRACE
* = POINT COUNT ANALYSIS
PARCEL NO. 6128138
622 MAIN STREET
MERIDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
Illinois Department of Transportation
DRAWN DL
CHECKED JC
DATE 2-24-14
PROJECTED 00471712
SCALE NTS
WO # 499
4

APPENDIX B

MATERIAL DESCRIPTION TABLE

Material Description	% And Type Of Asbestos	Location, Description, Sample Number (If Applicable)
I. 404 Main St. Meredosia, IL (Building Removal No. 7)		
Chimney flashing (Black, Homogeneous)	10% Chrysotile	Upper roof; Good Condition; Client ID 03-07
Duct seam tape (Gray, Homogeneous)	40% Chrysotile	Basement and crawl space; Good Condition; Client ID 05-13
3" OD air cell pipe insulation (Gray, Homogeneous)	60% Chrysotile	Remnant found near basement stairs; Poor Condition; Client ID 06-16
9" x 9" tan/brown/white streaks vinyl floor tile/mastic (Tan, Homogeneous)	2% Chrysotile	Kitchen; Good Condition; Client ID 11-31, 11-32, and 11-33
Beige with brown and white streaks vinyl floor tile/mastic (Beige, Homogeneous)	5% Chrysotile	Living Room; Good Condition; Client ID 13-37, 13-38, and 13-39
9" x 9" tan/brown and beige streaks vinyl floor tile/mastic (Tan, Homogeneous)	4% Chrysotile	Living Room; Good Condition; Client ID 14-40, 14-41, and 14-42
12" x 12" gray with gray/white splotches vinyl floor tile/mastic (Gray, Homogeneous)	3% Chrysotile	Utility room and closet; Good Condition; Client ID 17-49, 17-50, and 17-51
II. 522 Main St. Meredosia, IL (Building Removal No. 14)		
Black flashing (Black, Homogeneous)	4% Chrysotile	House and porch roofs; Good Condition; Client ID 02-04
Brown vinyl sheet flooring/mastic (Brown, Homogeneous)	12% Chrysotile	Dining Room; Good Condition; Client ID 04-10, 04-11, and 04-12
Wrapped paper pipe insulation (Brown,	40% Chrysotile	Basement, crawl space; Poor Condition; Client ID

Homogeneous)		11-31
Mudded joint packing on wrapped paper pipe insulation (Brown, Homogeneous)	70% Chrysotile	Basement, crawl space; Poor Condition; Client ID 12-34

III. 622 Main St. Meredosia, IL (Building Removal No. 17)

Wrapped paper pipe insulation (Gray, Homogeneous)	30% Chrysotile	East basement; Fair Condition; Client ID 06-16
Mudded joint packing on wrapped paper pipe insulation (Off-White, Homogeneous)	10% Chrysotile	East basement; Fair Condition; Client ID 07-19
Corrugated pipe insulation (Gray, Homogeneous)	40% Chrysotile	East basement; Fair Condition; Client ID 08-22
Terrazzo pattern vinyl sheet flooring (Beige, Homogeneous)	10% Chrysotile	2nd floor restroom; Good Condition; Client ID 09-25

APPENDIX C

MATERIAL QUANTITIES TABLE

The following are approximate quantities of ACM to be removed from the building indicated. These material quantities do not indicate the cleaning required to remove asbestos debris and resulting contamination from the work areas.

I. 404 Main St. Meredosia, IL (Building Removal No. 7)

Material	Floor	Quantity Present	Friable
Chimney flashing	Upper roof	15 LF	No
Duct seam tape	Basement and crawl space	350 SF	Yes
3" OD air cell pipe insulation	Remnant found near basement stairs	3 LF	Yes
9" x 9" tan/brown/white streaks vinyl floor tile/mastic	1st Floor	150 SF	No
Beige with brown and white streaks vinyl floor tile/mastic	1st Floor	100 SF	No
9" x 9" tan/brown and beige streaks vinyl floor tile/mastic	1st Floor	100 SF	No
12" x 12" gray with gray/white splotches vinyl floor tile/mastic	1st Floor	100 SF	No

II. 522 Main St. Meredosia, IL (Building Removal No. 14)

Material	Floor	Quantity Present	Friable
Black flashing	Roof	10 LF	No
Brown vinyl sheet flooring/mastic	1st Floor	210 SF	No
Wrapped paper pipe insulation	Basement, crawl space	50 LF	Yes
Mudded joint packing on wrapped paper pipe insulation	Basement, crawl space	5 EACH	Yes

III. 622 Main St. Meredosia, IL (Building Removal No. 17)

Material	Floor	Quantity Present	Friable
Wrapped paper pipe insulation	East basement	70 LF	Yes
Mudded joint packing on wrapped paper pipe insulation	East basement	10 EACH	Yes
Corrugated pipe insulation	East basement	30 LF	Yes
Terrazzo pattern vinyl sheet flooring	2nd Floor	25 SF	No

APPENDIX D

SHIPPING MANIFEST

Generator

1. Work Site Name and Mailing Address	Owner's Name		Owner's Telephone No.
2. Operator's Name and Address			Operator's. Telephone No
3. Waste Disposal Site (WDS) Name Mailing Address, and Physical Site Location			WDS Telephone No.
4. Name and Address of Responsible Agency			
5. Description of Materials			
6. Containers	No.	Type	
7. Total Quantity	M^3	(Yd^3)	
8. Special Handling Instructions and Additional Information			
9. OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.			
Printed/Typed Name & Title	Signature		Month Day Year

Transporter

10. Transporter 1 (Acknowledgement of Receipt of Materials)		
Printed/Typed Name & Title Address and Telephone No.	Signature	Month Day Year
11. Transporter 2 (Acknowledgement of Receipt of Materials)		
Printed/Typed Name & Title Address and Telephone No.	Signature	Month Day Year

Disposal Site

12. Discrepancy Indication Space		
13. Waste Disposal Site Owner or Operator: Certification of Receipt of Asbestos Materials Covered By This Manifest Except As Noted in Item 12		
Printed/Typed Name & Title	Signature	Month Day Year

APPENDIX D

INSTRUCTIONS

Waste Generator Section (Items 1-9)

1. Enter the name of the facility at which asbestos waste is generated and the address where the facility is located. In the appropriate spaces, also enter the name of the owner of the facility and the owner's phone number.

2. If a demolition or renovation, enter the name and address of the Company and authorized agent responsible for performing the asbestos removal. In the appropriate spaces, also enter the phone number of the operator.

3. Enter the name, address, and physical site location of the waste disposal site (WDS) that will be receiving the asbestos materials. In the appropriate spaces, also enter the phone number of the WDS. Enter "on-site" if the waste will be disposed of on the generator's property.

4. Provide the name and address of the local, State, or EPA Regional Office responsible for administering the asbestos NESHAP program.

5. Indicate the types of asbestos waste materials generated. If from a demolition or renovation, indicate the amount of asbestos that is

   - Friable asbestos material
   - Nonfriable asbestos material

6. Enter the number of containers used to transport the asbestos materials listed in Item 5. Also enter one of the following container codes used in transporting each type of asbestos material (specify any other type of container used if not listed below):

   DM - Metal drums, barrels
   DP - Plastic drums, barrels
   BA - 6 mil plastic bags or wrapping

7. Enter the quantities of each type of asbestos material removed in units of cubic meters (cubic yards).

8. Use this space to indicate special transportation, treatment, storage or disposal or Bill of Lading information. If an alternate waste disposal site is designated, note it here. Emergency response telephone numbers or similar information may be included here.

9. The authorized agent of the waste generator shall read and then sign and date this certification. The date is the date of receipt by transporter.

NOTE: The waste generator shall retain a copy of this form.

APPENDIX D

INSTRUCTIONS

Transporter Section (Items 10 & 11)

10. & 11. Enter name, address, and telephone number of each transporter used, if applicable. Print or type the full name and title of person accepting responsibility and acknowledging receipt of materials as listed on this waste shipment record for transport.

NOTE: The transporter shall retain a copy of this form.

Disposal Site Section (Items 12 & 13)

12. The authorized representative of the WDS shall note in this space any discrepancy between waste described on this mainfest and waste actually received as well as any improperly enclosed or contained waste. Any rejected materials should be listed and destination of those materials provided. A site that converts asbestos-containing waste material to nonasbestos material is considered a WDS.

13. The signature (by hand) of the authorized WDS agent indicates acceptance and agreement with statements on this manifest except as noted in Item 12. The date is the date of signature and receipt of shipment.

NOTE: The WDS shall retain a completed copy of this form. The WDS shall also send a completed copy to the operator listed in Item 2.

APPENDIX E

Bldg. No.	Parcel No.	Location	Description
7	6128132	404 Main St. Meredosia, IL	Two-story wood structure with a full basement and an asphalt shingled roof.
14	6128136	522 Main St. Meredosia, IL	Two-story wood and masonry structure with a basement and an asphalt-shinged roof.
17	6128138	622 Main St. Meredosia, IL	Two-story wood structure with a basement and an asphalt-shinged roof.

BUILDING REMOVAL – CASE II (NON-FRIABLE ASBESTOS ABATEMENT) (BDE)
Effective: September 1, 1990
Revised: April 1, 2010

BUILDING REMOVAL: This work shall consist of the removal and disposal of 4 building(s), together with all foundations, retaining walls, and piers, down to a plane 1 ft (300 mm) below the ultimate or existing grade in the area and also all incidental and collateral work necessary to complete the removal of the building(s) in a manner approved by the Engineer. Any holes, such as basements, shall be filled with a suitable granular material. The building(s) are identified as follows:

Bldg. No.	Parcel No.	Location	Description
1	6128127	113 N. Washington St. Meredosia, IL	One-story wood structure on a concrete slab with an asphalt-shingled roof.
3	6128128	104 N. Washington St. Meredosia, IL	One-story wood frame structure on concrete slab with pitched asphalt-shingled roof.
5	6128130	121 N. Green St. Meredosia, IL	Two-story wood structure on a crawl space with an asphalt-shingled roof.
11	6128134	NE Corner of Main St. and Marion St. Meredosia, IL	Two-story wooden house with a shingled roof.

Discontinuance of Utilities: The Contractor shall arrange for the discontinuance of all utility services and the removal of the metering devices that serve the building(s) according to the respective requirements and regulations of the City, County, or utility companies involved. The Contractor shall disconnect and seal, in an approved manner, all service outlets that serve any building(s) he/she is to remove.

Signs: Immediately upon execution of the contract and prior to the wrecking of any structures, the Contractor shall be required to paint or stencil, in contrasting colors of an oil base paint, on all four sides of each residence and two opposite sides of other structures, the following sign:

PROPERTY ACQUIRED FOR
HIGHWAY CONSTRUCTION
TO BE DEMOLISHED BY THE

VANDALS WILL BE PROSECUTED

The signs shall be positioned in a prominent location on the structure so that they can be easily seen and read and at a sufficient height to prevent defacing. The Contractor shall not paint signs nor start demolition of any building(s) prior to the time that the State becomes the owner of the respective building(s).

The Contractor has the option of removing the non-friable asbestos prior to demolition or demolishing the building(s) with the non-friable asbestos in place. Refer to the Special Provisions titled “Asbestos Abatement (General Conditions)” and “Removal and Disposal of Non-Friable Asbestos Building No. 1, 3, 5 and 11” contained herein.

Basis of Payment: This work will be paid for at the contract lump sum unit price for BUILDING REMOVAL, numbers as listed above, which price shall be payment in full for complete removal of the buildings and structures, including any necessary backfilling material as specified herein. The lump sum unit price(s) for this work shall represent the cost of demolition and disposal assuming all non-friable asbestos is removed prior to demolition. Any salvage value shall be reflected in the contract unit price for this item.

EXPLANATION OF BIDDING TERMS: Two separate contract unit price items have been established for the removal of each building. They are:

1. BUILDING REMOVAL NO. 1, 3, 5 and 11

2. REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 1, 3, 5 and 11

The Contractor shall have two options available for the removal and disposal of the non-friable asbestos.

The pay item for removal and disposal of non-friable asbestos will not be deleted regardless of the option chosen by the Contractor.

ASBESTOS ABATEMENT (GENERAL CONDITIONS): This work consists of the removal and disposal of non-friable asbestos from the building(s) to be demolished. All work shall be done according to the requirements of the U.S. Environmental Protection Agency (USEPA), the Illinois Environmental Protection Agency (IEPA), the Occupational Safety and Health Administration (OSHA), the Special Provision for "Removal and Disposal of Non-Friable Asbestos, Building No. 1, 3, 5 and 11," and as outlined herein.

Sketches indicating the location of Asbestos Containing Material (ACM) are included in the proposal on pages 78 thru 86. Also refer to the Materials Description Table on page 87 for a brief description and location of the various materials. Also included is a Materials Quantities Table on page 88. This table states the ACM is non-friable and gives the approximate quantity. The quantities are given only for information and it shall be the Contractor's responsibility to determine the exact quantities prior to submitting his/her bid.

The work involved in the removal and disposal of non-friable asbestos if done prior to demolition, shall be performed by a Contractor or Sub-Contractor prequalified with the Illinois Capital Development Board.

The Contractor shall provide a shipping manifest, similar to the one shown on page 89, to the Engineer for the disposal of all ACM wastes.

Permits: The Contractor shall apply for permit(s) in compliance with applicable regulations of the Illinois Environmental Protection Agency. Any and all other permits required by other federal, state, or local agencies for carrying on the work shall be the responsibility of the Contractor. Copies of the permit(s) shall be sent to the district office and the Engineer.

Notifications: The "Demolition/Renovation Notice" form, which can be obtained from the IEPA office, shall be completed and submitted to the address listed below at least ten days prior to commencement of any asbestos removal or demolition activity. Separate notices shall be sent for the asbestos removal work and the building demolition if they are done as separate operations.

Asbestos Demolition/Renovation Coordinator
Illinois Environmental Protection Agency
Division of Air Pollution Control
P. O. Box 19276
Springfield, Illinois 62794-9276
(217) 785-1743

Notices shall be updated if there is a change in the starting date or the amount of asbestos changes by more than 20 percent.

Submittals:

A. All submittals and notices shall be made to the Engineer except where otherwise specified herein.

B. Submittals that shall be made prior to start of work:

1. Submittals required under Asbestos Abatement Experience.

2. Submit documentation indicating that all employees have had medical examinations and instruction on the hazards of asbestos exposure, on use and fitting of respirators, on protective dress, on use of showers, on entry and exit from work areas, and on all aspects of work procedures and protective measures as specified in Worker Protection Procedures.

3. Submit manufacturer's certification stating that vacuums, ventilation equipment, and other equipment required to contain airborne fibers conform to ANSI 29.2.

4. Submit to the Engineer the brand name, manufacturer, and specification of all sealants or surfactants to be used. Testing under existing conditions will be required at the direction of the Engineer.

5. Submit proof that all required permits, site locations, and arrangements for transport and disposal of asbestos-containing or asbestos-contaminated materials, supplies, and the like have been obtained (i.e., a letter of authorization to utilize designated landfill).

6. Submit a list of penalties, including liquidated damages, incurred through non-compliance with asbestos abatement project specifications.

7. Submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination units, the sequencing of work, the respiratory protection plan to be used during this work, a site safety plan, a disposal plan including the location of an approved disposal site, and a detailed description of the methods to be used to control pollution. The plan shall be submitted to the Engineer prior to the start of work.

8. Submit proof of written notification and compliance with the “Notifications” paragraph.

C. Submittals that shall be made upon completion of abatement work:

1. Submit copies of all waste chain-of-custodies, trip tickets, and disposal receipts for all asbestos waste materials removed from the work area;

2. Submit daily copies of work site entry logbooks with information on worker and visitor access;

3. Submit logs documenting filter changes on respirators, HEPA vacuums, negative pressure ventilation units, and other engineering controls; and

4. Submit results of any bulk material analysis and air sampling data collected during the course of the abatement including results of any on-site testing by any federal, state, or local agency.

Certificate of Insurance:

A. The Contractor shall document general liability insurance for personal injury, occupational disease and sickness or death, and property damage.

B. The Contractor shall document current Workmen's Compensation Insurance coverage.

C. The Contractor shall supply insurance certificates as specified by the Department.

Asbestos Abatement Experience:

A. Company Experience. Prior to starting work, the Contractor shall supply evidence that he/she has been prequalified with the Illinois Capital Development Board and that he/she has been included on the Illinois Department of Public Health's list of approved Contractors.

B. Personnel Experience:

1. For Superintendent, the Contractor shall supply:

a. Evidence of knowledge of applicable regulations in safety and environmental protection is required as well as training in asbestos abatement as evidenced by the successful completion of a training course in supervision of asbestos abatement as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to the Engineer prior to the start of work.

b. Documentation of experience with abatement work in a supervisory position as evidenced through supervising at least two asbestos abatement projects; provide names, contact, phone number, and locations of two projects in which the individual(s) has worked in a supervisory capacity.

2. For workers involved in the removal of asbestos, the Contractor shall provide training as evidenced by the participation and successful completion of an accredited training course for asbestos abatement workers as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to all employees who will be working on this project.

ABATEMENT AIR MONITORING: The Contractor shall comply with the following:

A. Personal Monitoring. All personal monitoring shall be conducted per specifications listed in OSHA regulation, Title 29, Code of Federal Regulation 1926.58. All area sampling shall be conducted according to 40 CFR Part 763.90. All air monitoring equipment shall be calibrated and maintained in proper operating condition. Excursion limits shall be monitored daily. Personal monitoring is the responsibility of the Contractor. Additional personal samples may be required by the Engineer at any time during the project.

B. Interior Non-Friable Asbestos-Containing Materials. The Contractor shall perform personal air monitoring during removal of all non-friable Transite and floor tile removal operations. The Engineer will also have the option to require additional personal samples and/or clearance samples during this type of work.

C. Exterior Non-Friable Asbestos-Containing Materials. The Contractor shall perform personal air monitoring during removal of all non-friable cementitious panels, piping, roofing felts, and built up roofing materials that contain asbestos.

   The Contractor shall conduct down wind area sampling to monitor airborne fiber levels at a frequency of no less than three per day.

D. Air Monitoring Professional

   1. All air sampling shall be conducted by a qualified Air Sampling Professional supplied by the Contractor. The Air Sampling Professional shall submit documentation of successful completion of the National Institute for Occupational Safety and Health (NIOSH) course #582 - "Sampling and Evaluating Airborne Asbestos Dust".

   2. Air sampling shall be conducted according to NIOSH Method 7400. The results of these tests shall be provided to the Engineer within 24 hours of the collection of air samples.

REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 1, 3, 5 and 11: The Contractor has the option of removing and disposing of the non-friable asbestos prior to demolition of the building(s) or demolishing the building(s) with the non-friable asbestos in place.

Option #1 - If the Contractor chooses to remove all non-friable asbestos prior to demolition, the work shall be done according to the Special Provision titled "Asbestos Abatement (General Conditions)".

Option #2 - If the Contractor chooses to demolish the building(s) with the non-friable asbestos in place, the following provisions shall apply:

1. Continuously wet all non-friable ACM and other building debris with water during demolition.

2. Dispose of all demolition debris as asbestos containing material by placing it in lined, covered transport haulers and placing it in an approved landfill.

This work will be paid for at the contract unit price per lump sum for REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 1, 3, 5 and 11, as shown.

The cost for this work shall be determined as follows:

Option #1 - Actual cost of removal and disposal of non-friable asbestos.

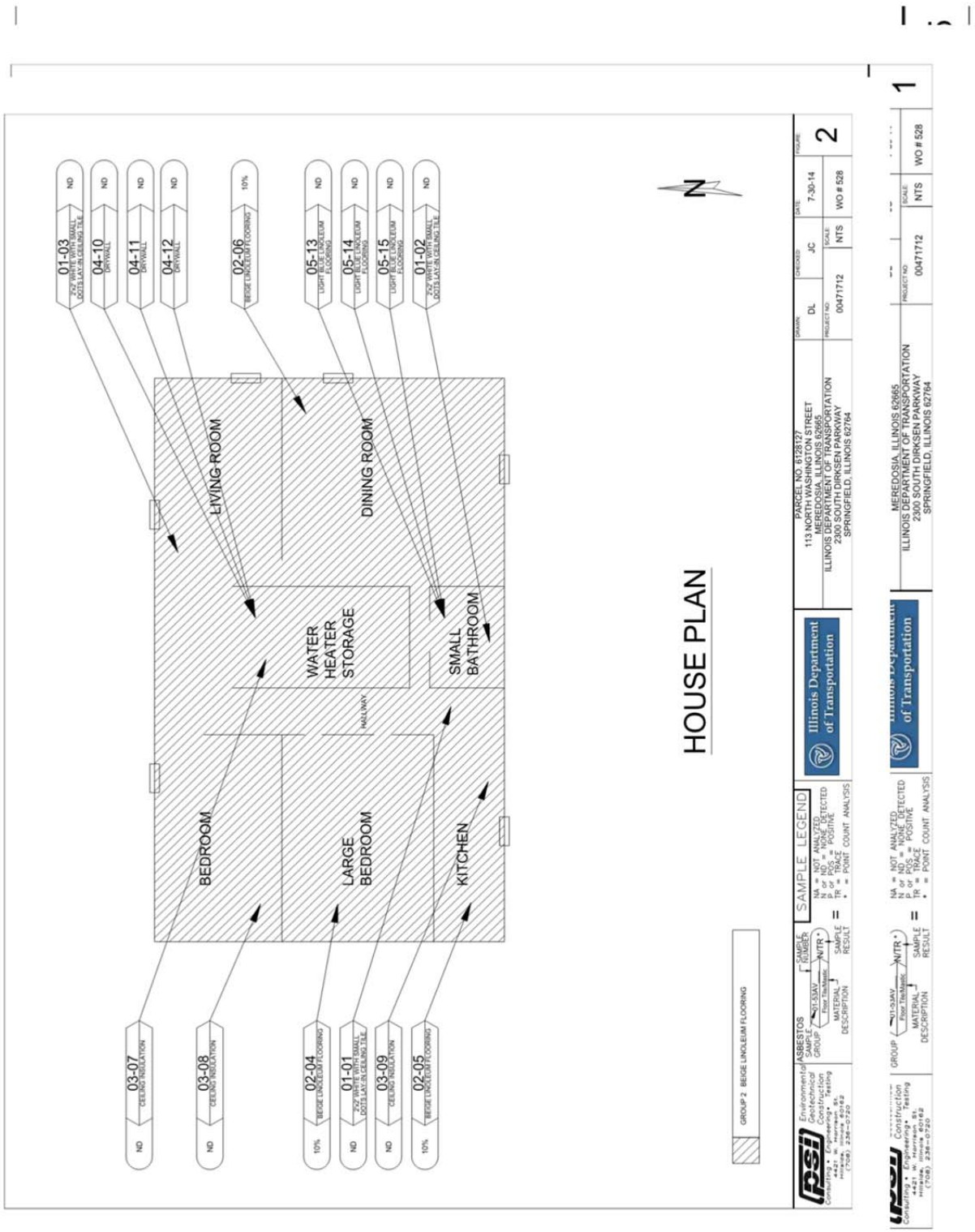
Option #2 - The difference in cost between removing and disposing of the building if all non-friable asbestos is left in place and removing and disposing of the building assuming all non-friable asbestos is removed prior to demolition.

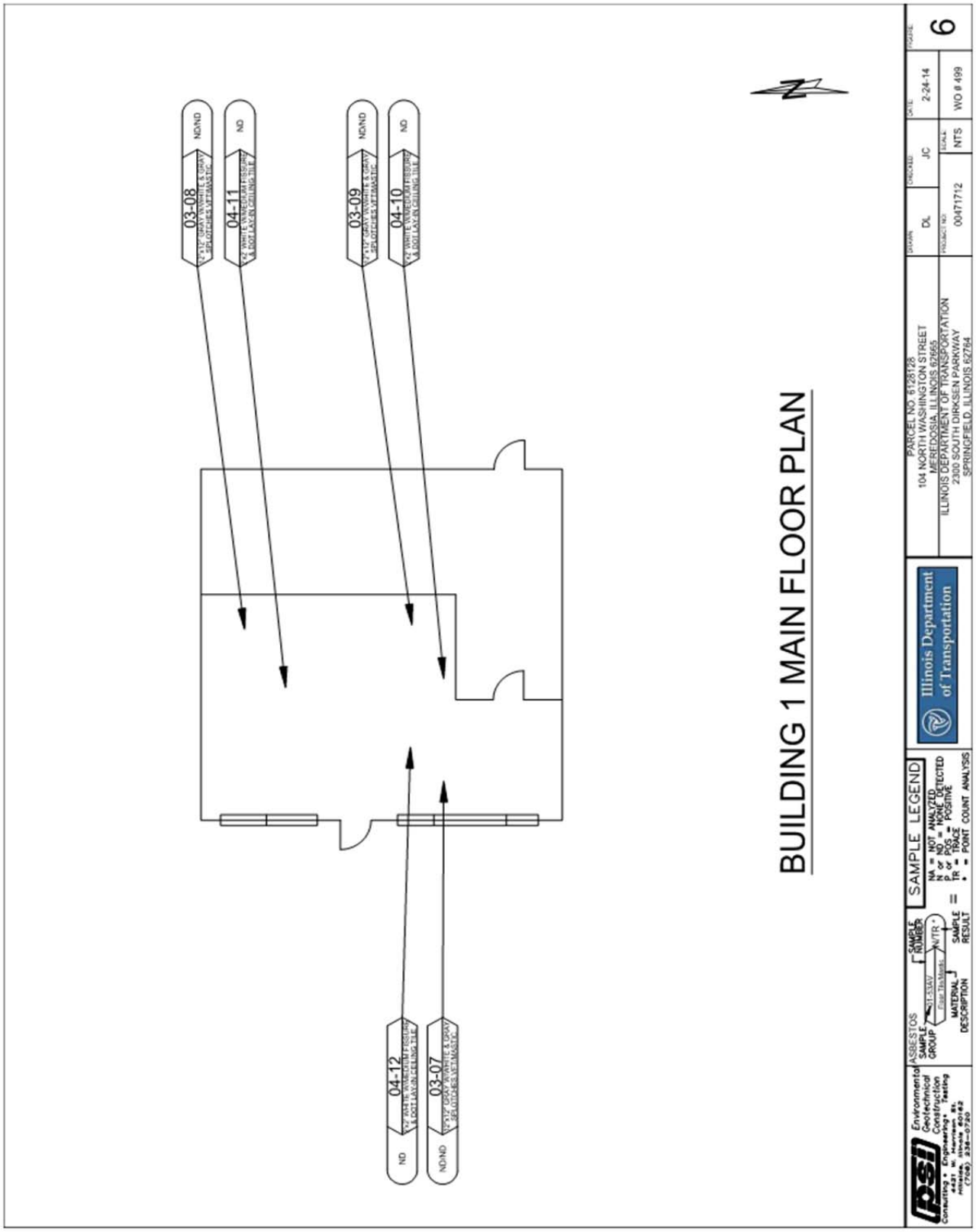
The cost of removing and disposing of the building(s), assuming all non-friable asbestos is removed first, shall be represented by the pay item "BUILDING REMOVAL NO. 1, 3, 5 and 11".

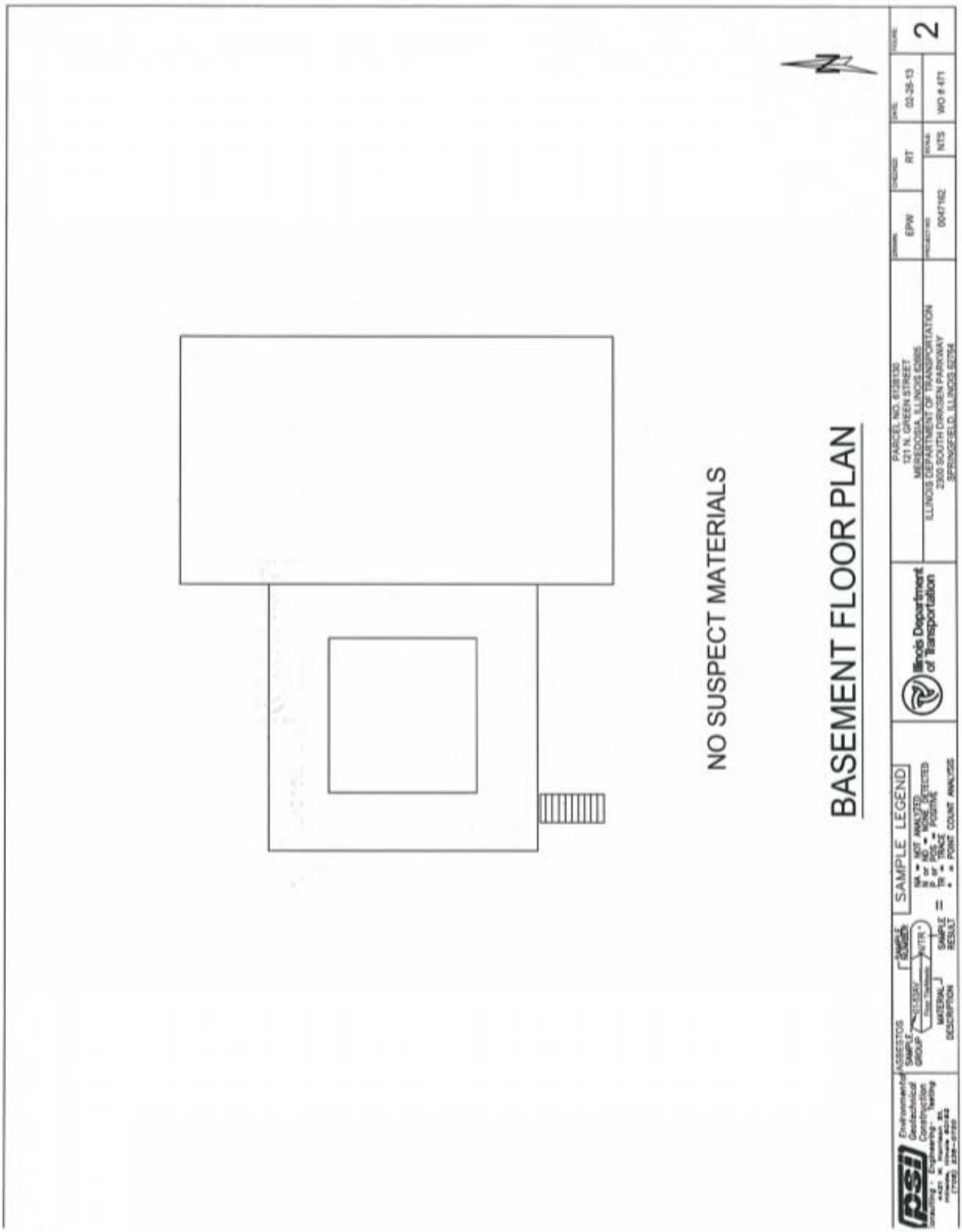
Regardless of the option chosen by the Contractor, this pay item will not be deleted, nor will the pay item BUILDING REMOVAL NO. 1, 3, 5 and 11 be deleted.

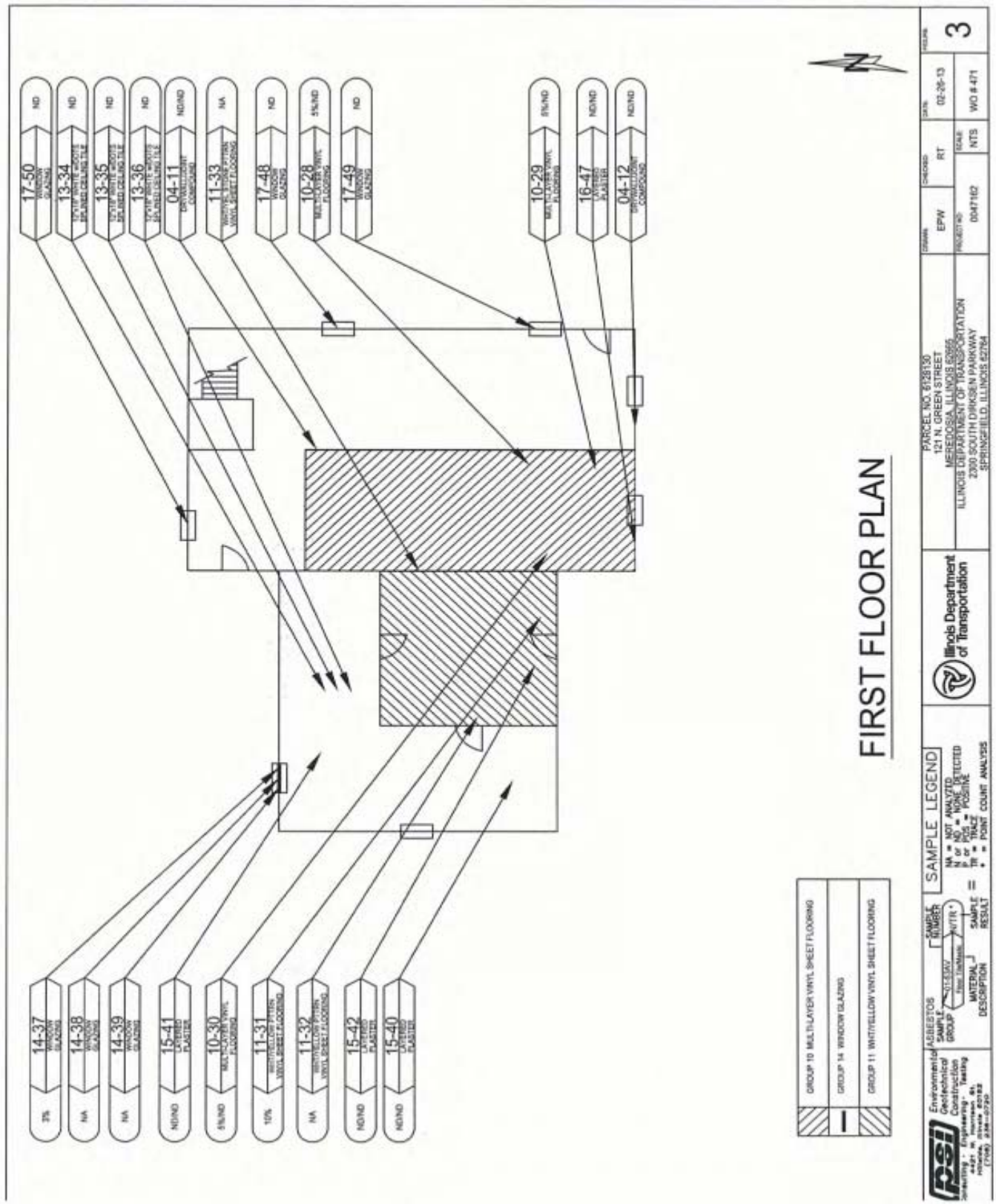
APPENDIX A

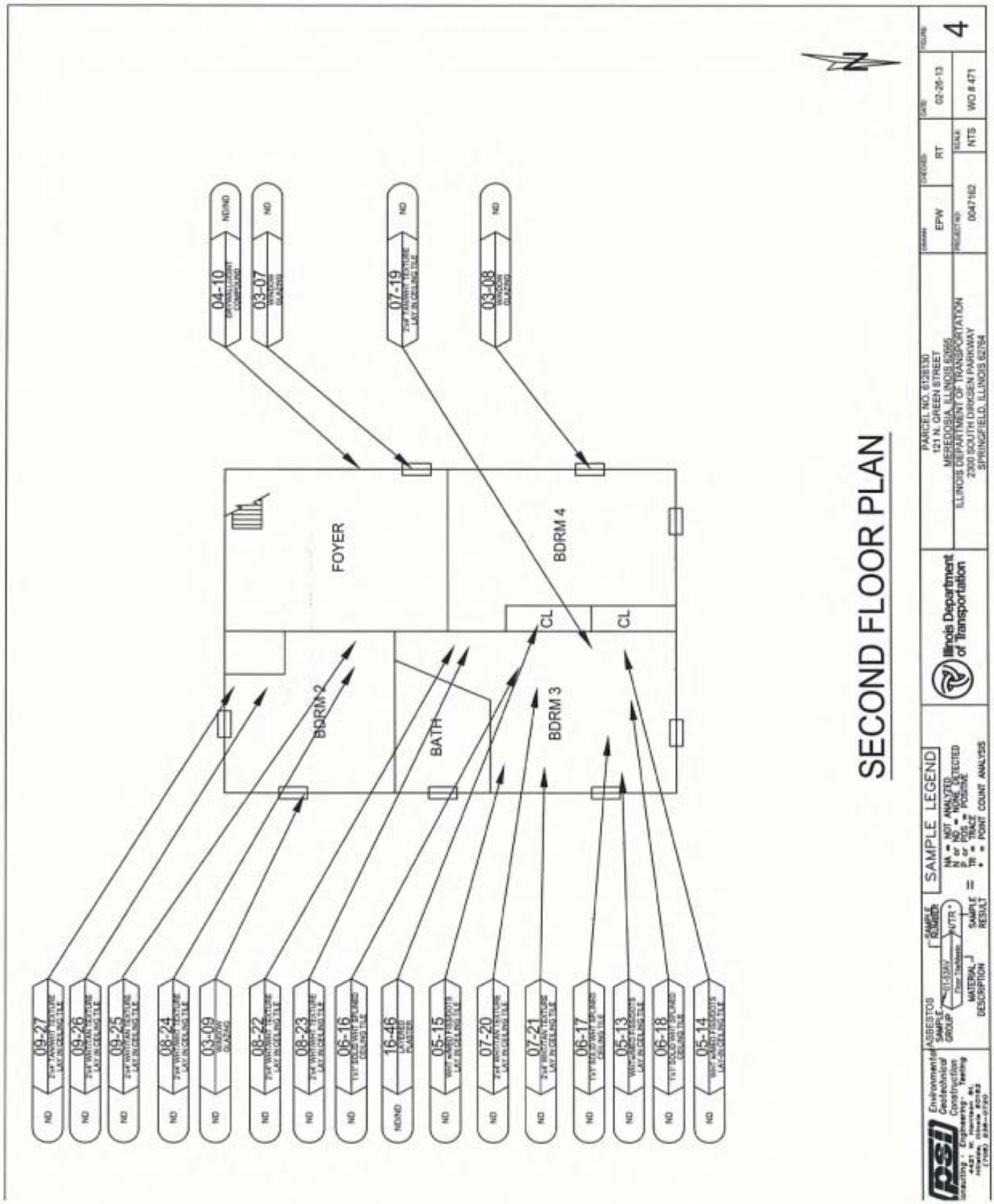
SKETCHES OF BUILDING NO.'s 1, 3, 5 and 11

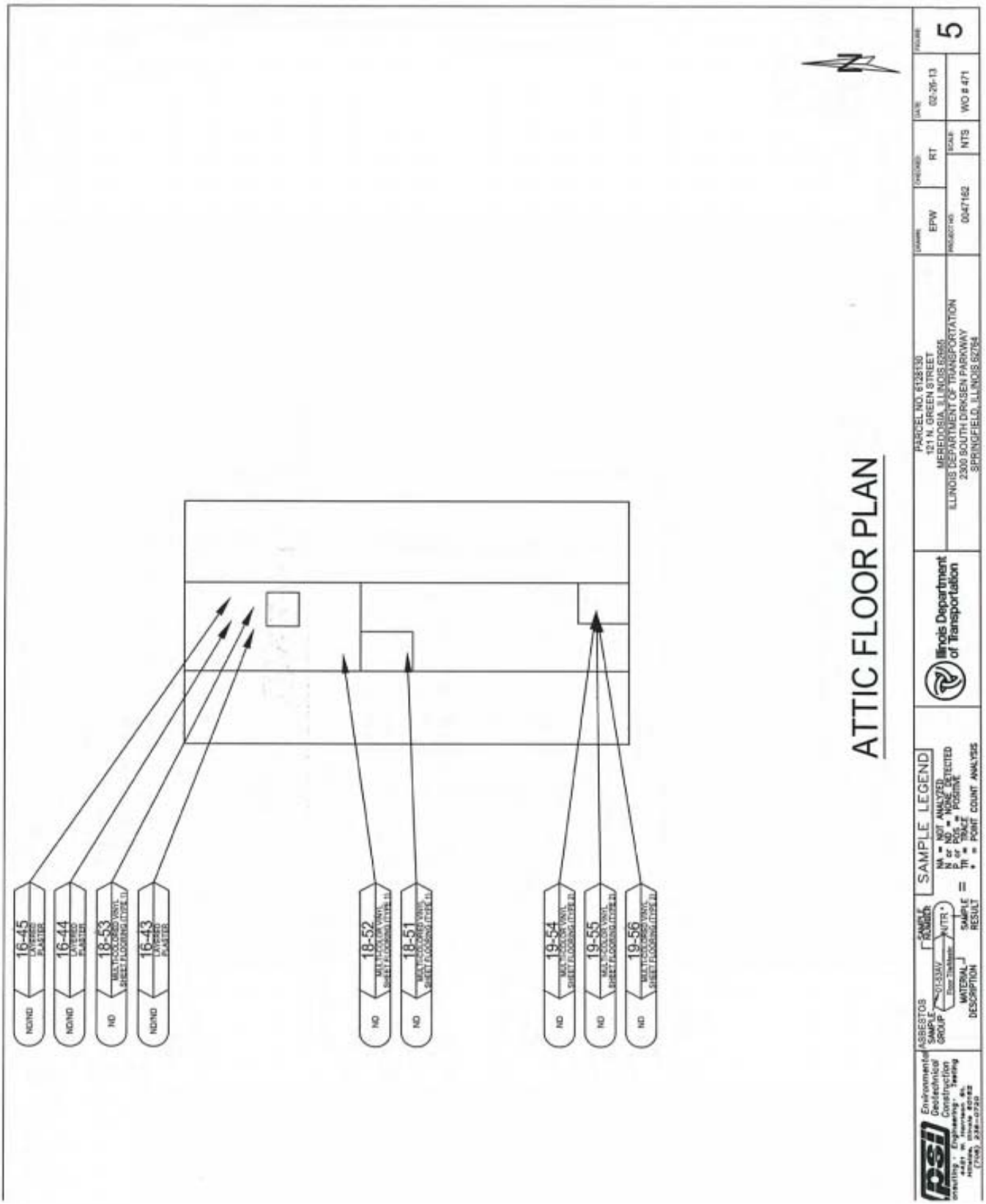


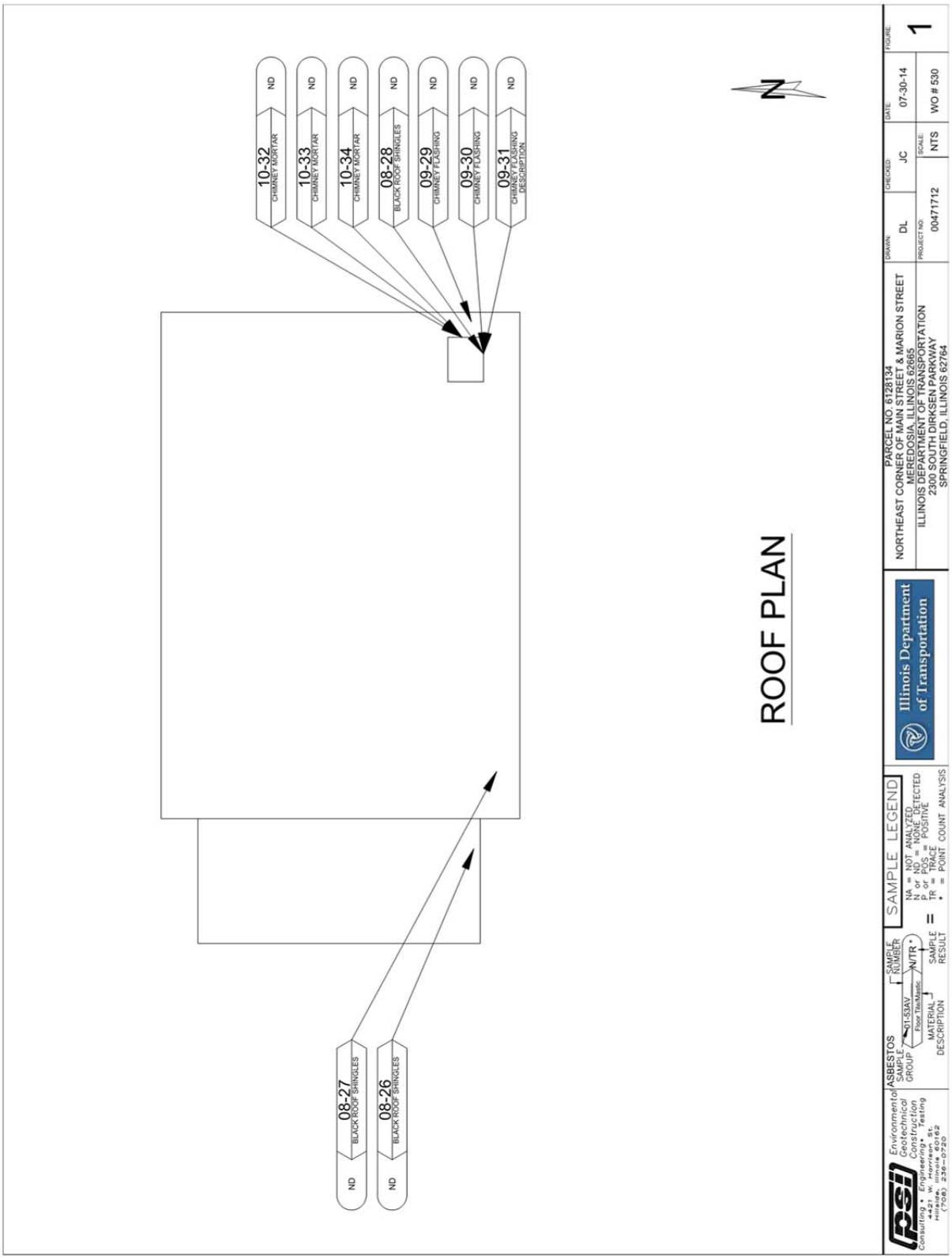

BUILDING 1 MAIN FLOOR PLAN
03-08
ND/ND
04-11
ND
03-09
ND/ND
04-10
ND
04-12
ND
03-07
ND/ND
SAMPLE LEGEND
NA = NOT ANALYZED
N or ND = NONE DETECTED
R or + = POSITIVE
TR = TRACE
* = POINT COUNT ANALYSIS
Illinois Department of Transportation
PARCEL NO. 6126126
104 NORTH WASHINGTON STREET
MERIDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
DL
JC
2-24-14
00471712
NTS
WO # 499
6

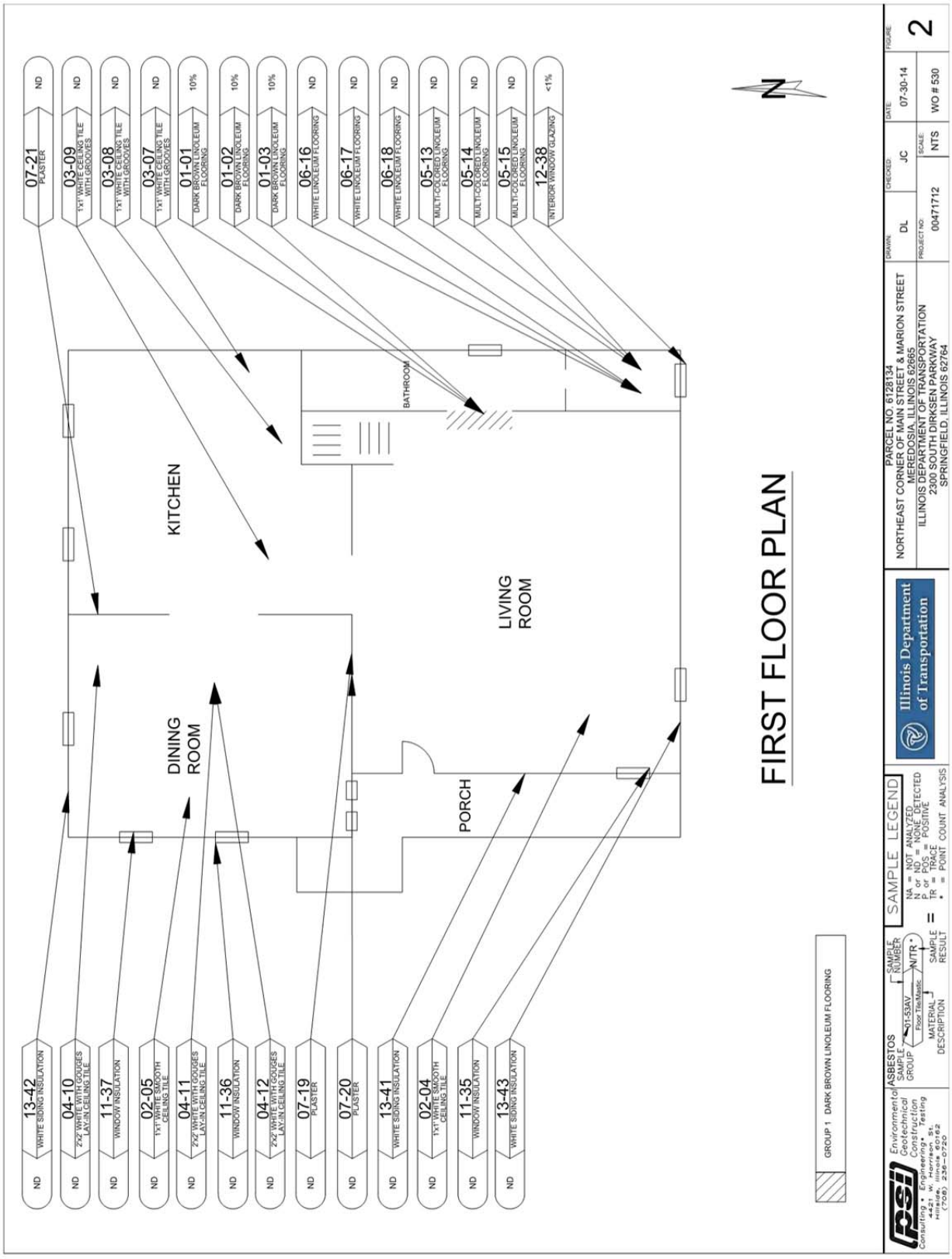

N
NO SUSPECT MATERIALS
BASEMENT FLOOR PLAN
SAMPLE LEGEND
Illinois Department of Transportation
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62704
EPW
RT
NTS
2

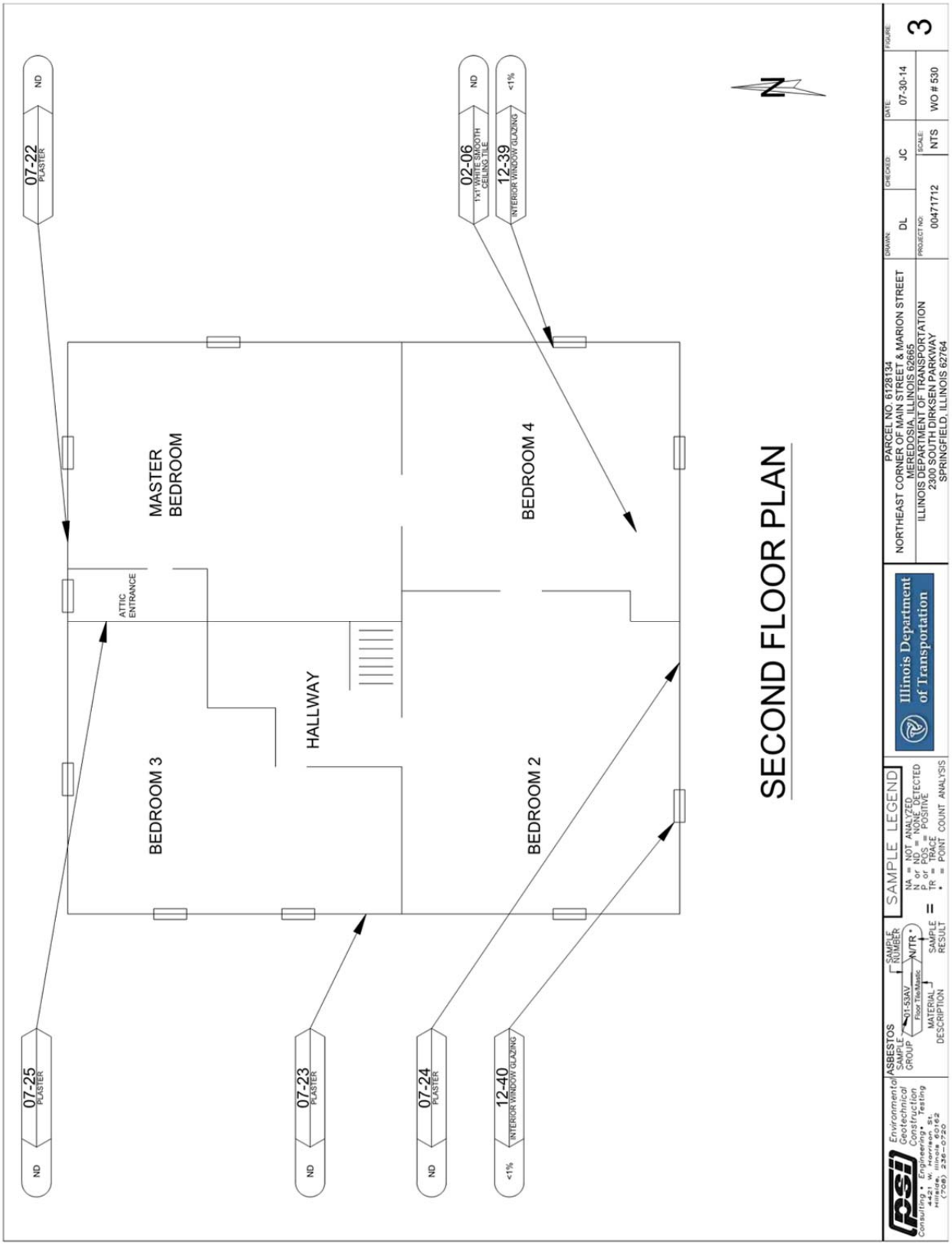

FIRST FLOOR PLAN
SAMPLE LEGEND
GROUP 10 MULTI-PLAYER VINYL SHEET FLOORING
GROUP 14 WINDOW GLAZING
GROUP 11 WHITE/YELLOW VINYL SHEET FLOORING
Illinois Department of Transportation
PARCEL NO. 628130
121 N. GREEN STREET
MERIDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
02-26-13
WO # 471
NTS
0047162
EPW
RT
3


SECOND FLOOR PLAN
FOYER
BDRM 4
BDRM 2
BATH
BDRM 3
CL
CL
04-10
03-07
07-19
03-08
09-27
09-26
09-25
08-24
03-09
08-22
08-23
06-16
16-46
05-15
07-20
07-21
06-17
05-13
06-18
05-14
ND
NONE
SAMPLE LEGEND
Illinois Department of Transportation
PARCEL NO. 6728130
121 N. GREEN STREET
MERIDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
EPW
RT
02-26-13
NTS
WO # 471
4


ATTIC FLOOR PLAN
N
16-45
16-44
18-53
16-43
18-52
18-51
19-54
19-55
19-56
ND/ND
ND
SAMPLE LEGEND
NA = NOT ANALYZED
N or ND = NONE DETECTED
P or POS = POSITIVE
Tr = TRACE
+ = POINT COUNT ANALYSIS
Illinois Department of Transportation
PARCEL NO. 6128130
121 N. GREEN STREET
MERIDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
EPW
RT
02-26-13
NTS
WO # 471
0047162
5


10-32
CHIMNEY MORTAR
ND
10-33
CHIMNEY MORTAR
ND
10-34
CHIMNEY MORTAR
ND
08-28
BLACK ROOF SHINGLES
ND
09-29
CHIMNEY FLASHING
ND
09-30
CHIMNEY FLASHING
ND
09-31
CHIMNEY FLASHING
DESCRIPTION
ND
08-27
BLACK ROOF SHINGLES
ND
08-26
BLACK ROOF SHINGLES
ND
N
ROOF PLAN
PARCEL NO. 6128134
NORTHEAST CORNER OF MAIN STREET & MARION STREET
MEREDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
DRAWN: DL
CHECKED: JC
DATE: 07-30-14
PROJECT NO. 00471712
SCALE: NTS
WO # 530
FIGURE: 1
Illinois Department of Transportation
ASBESTOS SAMPLE LEGEND
SAMPLE GROUP
SAMPLE NUMBER
MATERIAL DESCRIPTION
SAMPLE RESULT
NA = NOT ANALYZED
N or ND = NONE DETECTED
P or POS = POSITIVE
TR = TRACE
* = POINT COUNT ANALYSIS
PSI
Environmental
Geotechnical
Construction
Consulting • Engineering • Testing
(708) 236-0720


FIRST FLOOR PLAN
KITCHEN
DINING ROOM
LIVING ROOM
PORCH
BATHROOM
N
07-21 PLASTER ND
03-09 1'x1' WHITE CEILING TILE WITH GROOVES ND
03-08 1'x1' WHITE CEILING TILE WITH GROOVES ND
03-07 1'x1' WHITE CEILING TILE WITH GROOVES ND
01-01 DARK BROWN LINOLEUM FLOORING 10%
01-02 DARK BROWN LINOLEUM FLOORING 10%
01-03 DARK BROWN LINOLEUM FLOORING 10%
06-16 WHITE LINOLEUM FLOORING ND
06-17 WHITE LINOLEUM FLOORING ND
06-18 WHITE LINOLEUM FLOORING ND
05-13 MULTI-COLORED LINOLEUM FLOORING ND
05-14 MULTI-COLORED LINOLEUM FLOORING ND
05-15 MULTI-COLORED LINOLEUM FLOORING ND
12-38 INTERIOR WINDOW GLAZING <1%
13-42 WHITE SIDING INSULATION ND
04-10 2'x2' WHITE WITH GOUGES LAY-IN CEILING TILE ND
11-37 WINDOW INSULATION ND
02-05 1'x1' WHITE SMOOTH CEILING TILE ND
04-11 2'x2' WHITE WITH GOUGES LAY-IN CEILING TILE ND
11-36 WINDOW INSULATION ND
04-12 2'x2' WHITE WITH GOUGES LAY-IN CEILING TILE ND
07-19 PLASTER ND
07-20 PLASTER ND
13-41 WHITE SIDING INSULATION ND
02-04 1'x1' WHITE SMOOTH CEILING TILE ND
11-35 WINDOW INSULATION ND
13-43 WHITE SIDING INSULATION ND
GROUP 1 DARK BROWN LINOLEUM FLOORING
SAMPLE LEGEND
NA = NOT ANALYZED
N or ND = NONE DETECTED
POS = POSITIVE
TR or * = TRACE
* = POINT COUNT ANALYSIS
ASBESTOS SAMPLE GROUP
SAMPLE NUMBER
MATERIAL DESCRIPTION
SAMPLE RESULT
Illinois Department of Transportation
PARCEL NO. 6128134
NORTHEAST CORNER OF MAIN STREET & MARION STREET
MEREDOSIA, ILLINOIS 62665
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
DRAWN DL
CHECKED JC
DATE 07-30-14
PROJECT NO 00471712
SCALE NTS
WO # 530
FIGURE 2


SECOND FLOOR PLAN
N
MASTER BEDROOM
BEDROOM 3
HALLWAY
BEDROOM 4
BEDROOM 2
ATTIC ENTRANCE
07-22 PLASTER ND
07-25 PLASTER ND
07-23 PLASTER ND
07-24 PLASTER ND
12-40 INTERIOR WINDOW GLAZING <1%
02-06 1'x1' WHITE SMOOTH CEILING TILE ND
12-39 INTERIOR WINDOW GLAZING <1%
SAMPLE LEGEND
NA = NOT ANALYZED
N or ND = NONE DETECTED
P or POS. = POSITIVE
TR = TRACE
= POINT COUNT ANALYSIS
ASBESTOS SAMPLE GROUP
SAMPLE NUMBER
01-53AV
Floor Tile/Mastic
NTR*
MATERIAL DESCRIPTION
SAMPLE RESULT
Illinois Department of Transportation
NORTHEAST CORNER OF MAIN STREET & MARION STREET
MEREDOSIA, ILLINOIS 62665
PARCEL NO. 6128134
ILLINOIS DEPARTMENT OF TRANSPORTATION
2300 SOUTH DIRKSEN PARKWAY
SPRINGFIELD, ILLINOIS 62764
DRAWN DL
CHECKED JC
DATE 07-30-14
PROJECT NO. 00471712
SCALE NTS
WO # 530
FIGURE 3
Environmental
Geotechnical
Construction
Consulting • Engineering • Testing
4421 W. Harrison St.
Hillside, Illinois 60162
(708) 236-0720

APPENDIX B

MATERIAL DESCRIPTION TABLE

Material Description	% And Type Of Asbestos	Location, Description, Sample Number (If Applicable)
I. 113 N. Washington St. Meredosia, IL (Building Removal No. 1)		
Vinyl sheet flooring (beige, homogeneous)	10% Chrysotile	Throughout; Good Condition; Client ID 02-4
II. 104 N. Washington St. Meredosia, IL (Building Removal No. 3)		
Multi-layer flashing material (black, homogeneous)	5% Chrysotile	Roof; Good Condition; Client ID 02-04, 02-05, and 02-06
III. 121 N. Green St. Meredosia, IL (Building Removal No. 5)		
Multi-layer vinyl floor tile/mastic (tan, homogeneous)	5% Chrysotile	Kitchen; Good Condition; Client ID 10-28, 10-29, and 10-30
White with yellow stone pattern vinyl sheet flooring/mastic (yellow, homogeneous)	10% Chrysotile	West Wing Foyer; Good Condition; Client ID 11-31
Window glazing (white, homogeneous)	3% Chrysotile	Bedroom 1 Window; Good Condition; Client ID 14-37
IV. NE Corner of Main St. and Marion St. Meredosia, IL (Building Removal No. 11)		
Linoleum flooring (dark brown, homogeneous)	10% Chrysotile	Entrance between living room and bathroom; Poor Condition; Client ID 01-1

APPENDIX C

MATERIAL QUANTITIES TABLE

The following are approximate quantities of ACM to be removed from the building indicated. These material quantities do not indicate the cleaning required to remove asbestos debris and resulting contamination from the work areas.

I. 113 N. Washington St. Meredosia, IL (Building Removal No. 1)

Material	Floor	Quantity Present	Friable
Vinyl sheet flooring	Throughout	480 SF	No

II. 104 N. Washington St. Meredosia, IL (Building Removal No. 3)

Material	Floor	Quantity Present	Friable
Multi-layer roof flashing	Roof	40 LF	No

III. 121 N. Green St. Meredosia, IL (Building Removal No. 5)

Material	Floor	Quantity Present	Friable
Multi-layer vinyl floor tile/mastic	1st Floor	95 SF	No
White with yellow stone pattern vinyl sheet flooring/mastic	1st Floor	50 SF	No
Window glazing	1st Floor	36 LF	No

IV. NE Corner of Main St. and Marion St. Meredosia, IL (Building Removal No. 11)

Material	Floor	Quantity Present	Friable
Linoleum flooring	1st Floor	2 SF	No

APPENDIX D

SHIPPING MANIFEST

Generator

1. Work Site Name and Mailing Address	Owner's Name		Owner's Telephone No.
2. Operator's Name and Address			Operator's. Telephone No
3. Waste Disposal Site (WDS) Name Mailing Address, and Physical Site Location			WDS Telephone No.
4. Name and Address of Responsible Agency			
5. Description of Materials			
6. Containers	No.	Type	
7. Total Quantity	M^3	(Yd^3)	
8. Special Handling Instructions and Additional Information			
9. OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.			
Printed/Typed Name & Title	Signature		Month Day Year

Transporter

10. Transporter 1 (Acknowledgement of Receipt of Materials)		
Printed/Typed Name & Title Address and Telephone No.	Signature	Month Day Year
11. Transporter 2 (Acknowledgement of Receipt of Materials)		
Printed/Typed Name & Title Address and Telephone No.	Signature	Month Day Year

Disposal Site

12. Discrepancy Indication Space		
13. Waste Disposal Site Owner or Operator: Certification of Receipt of Asbestos Materials Covered By This Manifest Except As Noted in Item 12		
Printed/Typed Name & Title	Signature	Month Day Year

APPENDIX D

INSTRUCTIONS

Waste Generator Section (Items 1-9)

1. Enter the name of the facility at which asbestos waste is generated and the address where the facility is located. In the appropriate spaces, also enter the name of the owner of the facility and the owner's phone number.

2. If a demolition or renovation, enter the name and address of the Company and authorized agent responsible for performing the asbestos removal. In the appropriate spaces, also enter the phone number of the operator.

3. Enter the name, address, and physical site location of the waste disposal site (WDS) that will be receiving the asbestos materials. In the appropriate spaces, also enter the phone number of the WDS. Enter "on-site" if the waste will be disposed of on the generator's property.

4. Provide the name and address of the local, State, or EPA Regional Office responsible for administering the asbestos NESHAP program.

5. Indicate the types of asbestos waste materials generated. If from a demolition or renovation, indicate the amount of asbestos that is

   - Friable asbestos material
   - Nonfriable asbestos material

6. Enter the number of containers used to transport the asbestos materials listed in Item 5. Also enter one of the following container codes used in transporting each type of asbestos material (specify any other type of container used if not listed below):

   DM - Metal drums, barrels
   DP - Plastic drums, barrels
   BA - 6 mil plastic bags or wrapping

7. Enter the quantities of each type of asbestos material removed in units of cubic meters (cubic yards).

8. Use this space to indicate special transportation, treatment, storage or disposal or Bill of Lading information. If an alternate waste disposal site is designated, note it here. Emergency response telephone numbers or similar information may be included here.

9. The authorized agent of the waste generator shall read and then sign and date this certification. The date is the date of receipt by transporter.

NOTE: The waste generator shall retain a copy of this form.

APPENDIX D

INSTRUCTIONS

Transporter Section (Items 10 & 11)

10. & 11. Enter name, address, and telephone number of each transporter used, if applicable. Print or type the full name and title of person accepting responsibility and acknowledging receipt of materials as listed on this waste shipment record for transport.

NOTE: The transporter shall retain a copy of this form.

Disposal Site Section (Items 12 & 13)

12. The authorized representative of the WDS shall note in this space any discrepancy between waste described on this mainfest and waste actually received as well as any improperly enclosed or contained waste. Any rejected materials should be listed and destination of those materials provided. A site that converts asbestos-containing waste material to nonasbestos material is considered a WDS.

13. The signature (by hand) of the authorized WDS agent indicates acceptance and agreement with statements on this manifest except as noted in Item 12. The date is the date of signature and receipt of shipment.

NOTE: The WDS shall retain a completed copy of this form. The WDS shall also send a completed copy to the operator listed in Item 2.

APPENDIX E

Bldg. No.	Parcel No.	Location	Description
1	6128127	113 N. Washington St. Meredosia, IL	One-story wood structure on a concrete slab with an asphalt-shingled roof.
3	6128128	104 N. Washington St. Meredosia, IL	One-story wood frame structure on concrete slab with pitched asphalt-shingled roof.
5	6128130	121 N. Green St. Meredosia, IL	Two-story wood structure on a crawl space with an asphalt-shingled roof.

BUILDING REMOVAL – CASE IV (NO ASBESTOS) (BDE)
Effective: September 1, 1990
Revised: April 1, 2010

BUILDING REMOVAL: This work shall consist of the removal and disposal of 11 building(s), together with all foundations, retaining walls, and piers, down to a plane 1 ft (300 mm) below the ultimate or existing grade in the area and also all incidental and collateral work necessary to complete the removal of the building(s) in a manner approved by the Engineer. Any holes, such as basements, shall be filled with a suitable granular material. The building(s) are identified as follows:

Bldg. No.	Parcel No.	Location	Description
2	6128128	104 N. Washington St. Meredosia, IL	One-story wood frame structure on concrete slab with pitched asphalt-shingled roof.
4	6128130	121 N. Green St. Meredosia, IL	One-story wood framed shed with a rolled asphalt roof, below a metal roof.
6	6128132	404 Main St. Meredosia, IL	Shed.
8	6128133	119 N. Marion St. Meredosia, IL	One-story masonry structure on a concrete slab with a metal roof.
9	6128133	119 N. Marion St. Meredosia, IL	Commercial building.
10	6128134	NE Corner of Main St. and Marion St. Meredosia, IL	One-story manufactured home with metal siding and wood under siding with a flat metal roof.
12	6128135	516 Main St. Meredosia, IL	One-story wood and masonry structure with a partial basement and an asphalt shingled roof.
13	6128135	516 Main St. Meredosia, IL	One-car wood detached garage with an asphalt shingle roof.
15	6128137	610 Main St. Meredosia, IL	Shed and garage.
16	6128137	610 Main St. Meredosia, IL	Single family residence.
18	6128138	622 Main St. Meredosia, IL	Shed and garage.

Discontinuance of Utilities: The Contractor shall arrange for the discontinuance of all utility services and the removal of the metering devices that serve the building(s) according to the respective requirements and regulations of the City, County, or utility companies involved. The Contractor shall disconnect and seal, in an approved manner, all service outlets that serve any building(s) he/she is to remove.

Signs: Immediately upon execution of the contract and prior to the wrecking of any structures, the Contractor shall be required to paint or stencil, in contrasting colors of an oil base paint, on all four sides of each residence and two opposite sides of other structures, the following sign:

PROPERTY ACQUIRED FOR
HIGHWAY CONSTRUCTION
TO BE DEMOLISHED BY THE

VANDALS WILL BE PROSECUTED

The signs shall be positioned in a prominent location on the structure so that they can be easily seen and read and at a sufficient height to prevent defacing. The Contractor shall not paint signs nor start demolition of any building(s) prior to the time that the State becomes the owner of the respective building(s).

Basis of Payment: This work will be paid for at the contract lump sum unit price for BUILDING REMOVAL, numbers as listed above, which price shall be payment in full for complete removal of the buildings and structures, including any necessary backfilling material as specified herein. The lump sum unit price(s) for this work shall represent the cost of demolition. Any salvage value shall be reflected in the contract unit price for this item.

Notifications: The "Demolition/Renovation Notice" form, which can be obtained from the IEPA office, shall be completed and submitted to the address listed below at least ten days prior to commencement of any demolition activity.

Asbestos Demolition/Renovation Coordinator
Illinois Environmental Protection Agency
Division of Air Pollution Control
P. O. Box 19276
Springfield, Illinois 62794-9276
(217)785-1743

Notices shall be updated if there is a change in the starting date or the amount of asbestos changes by more than 20 percent.

Submittals:

A. All submittals and notices shall be made to the Engineer except where otherwise specified herein.

B. Prior to starting work, the Contractor shall submit proof of written notification and compliance with the “Notifications” paragraph.

BUILDING FOUNDATION REMOVAL

The buildings shall be removed as specified in the contract plans, per the respective BUILDING REMOVAL Special Provisions, and per the guidelines specified under this Special Provision for BUILDING FOUNDATION REMOVAL.

All associated structural elements attached to the building foundation below grade shall be removed down to a plane 1 ft below the bottom of the building foundation, unless otherwise specified on the contract plans for deeper or full removal.

The Contractor shall remove any existing floor drains, sewers or drainage structures associated with the building foundation at no additional cost to the contract.

Holes or voids created in the earth due to BUILDING FOUNDATION REMOVAL shall be backfilled with FURNISHED EXCAVATION (if required) such that the location can be site graded and seeded and present a neat and clean appearance on completion of the project. The Contractor shall notify the Engineer upon completion of each individual removal activity which will require backfill, prior to any backfill activity. The method of backfill and compaction must be approved by the Engineer.

Basements shall be backfilled per the Special Provision for BASEMENT FLOORS.

The Contractor shall notify the Engineer upon completion of each individual BUILDING FOUNDATION REMOVAL which will require backfill, prior to any backfill activity. The method of backfill and compaction must be approved by the Engineer.

This work will not be paid for separately, but will be considered as included in the contract lump sum price for BUILDING REMOVAL OF THE NO. SPECIFIED.

BASEMENT FLOORS

The Contractor shall break the concrete basement floors into pieces not exceeding 3 ft. square before the basement is filled with Porous Granular Embankment. The Contractor shall use a method approved by the Engineer to break the concrete basement floors. If the basement floors are within the limits of the proposed pavement, defined as within 2' of the edge of shoulder, then the fill material shall meet the compaction requirements in 205.06. Buildings 1-7, 8-9, 11-12, 14-15 have been determined to be all or partially within the limits of the proposed pavement. Steel slag sand shall not be used as fill. The Porous Granular Embankment work will be paid for separately, but the remainder of the work will be considered as included in the contract lump sum price for BUILDING REMOVAL OF THE NO. SPECIFIED.

FLOOR DRAINS

The Contractor shall remove any existing floor drains, sewers or drainage structures associated with the building foundation.

This work will not be paid for separately, but will be considered as included in the contract lump sum price for BUILDING REMOVAL OF THE NO. SPECIFIED.

CLEARING, SPECIAL

The Contractor is advised that it is the intent of the provision that each parcel within the limits of this Contract right-of-way, and as specified in the contract plans, be clear of all real property, chattel, and all rubbish such that the property can be site graded, seeded, and present a neat and clean appearance on completion of this project. The Contractor will be required to remove the following items (but not limited to): piles of miscellaneous fly dumping, piles of broken concrete and rubble, miscellaneous building debris, abandoned utility poles lying above ground or those which are erected and confirmed to be abandoned, abandoned structures and sewers lying above ground, patios, abandoned railroad tracks and ballasts, non-utilized signs and sign posts and foundations, wood posts, bollards, cable road guard, and all other miscellaneous remaining above ground items to the satisfaction and approval of the Engineer.

The Contractor is advised that it is the intent of the provision that each parcel also be clear of all shrubbery and landscape items such that the property can be site graded, seeded, and present a neat and clean appearance on completion of this project. The removal items will include, but not be limited to, all tree stumps not identified elsewhere in the plans, logs, shrubs, bushes, saplings, grass, weeds, other vegetation of a diameter less than 6 inches per Section 201 of the Standard Specifications. The Contractor will be required to remove and dispose of all such shrubs and brush as outlined herein to the satisfaction and approval of the Engineer.

The removal of these items specified herein does NOT include the removal of items already measured and paid for under the provision for DEBRIS REMOVAL, or other items individually measured and paid for per the Contract Plan Summary of Quantities and/ or per the Special Provisions.

The Contractor is advised to inspect the various items and quantities of clearing required on the parcels involved prior to bidding. Any quantities shown on the contract plans covered for removal under CLEARING, SPECIAL is for Contractor information only. The piles of debris and other non-quantified removal items noted on the plans are also for Contractor information only, and are not comprehensive. No additional compensation will be allowed for variations in removal items required to complete the CLEARING, SPECIAL as specified in this Special Provision for the subject parcels.

Unless specifically called out in the plans, existing utilities which are still located in the ground, including (but not limited to) power poles, light poles, utility structures, fire hydrants, water main, and sewers, shall not be included in the removal items for CLEARING, SPECIAL. The Contractor shall note any such existing utilities which conflict with items to be cleared, and request direction from the Engineer prior to clearing at these locations. Any damage to existing utilities by the Contractor shall be repaired by the Contractor at his own expense to the satisfaction of the Engineer.

Materials resulting from the clearing operations as herein specified shall be disposed of according to Article 202.03 at no additional cost to the contract.

Removal of the clearing items as herein specified, and incidental site grading as directed by the Engineer, will not be paid for separately, but considered as included in the contract lump sum price bid for CLEARING, SPECIAL.

Method of Measurement. The removal and clearing items for CLEARING, SPECIAL shall not be measured for payment individually. The removal and clearing items for CLEARING, SPECIAL shall be measured for payment as a lump sum for clearing of the locations as shown in the contract plans.

Basis of Payment. This work will be paid for at the contract lump sum price for CLEARING, SPECIAL.

DEBRIS REMOVAL

This work shall consist of the removal of and satisfactory disposal of various types of items/ materials from within the project limits of this contract and State Right of Way as specified herein and as shown on the contract plans. This work shall be paid for separately, and does NOT include the removal of items already measured and paid for individually per the Contract Plan Summary and Schedule of Quantities and other Special Provisions.

Debris removal shall include removal of, but not limited to, the following types of items: rubber tires, appliances that might contain refrigerants such as Freon, compressed gas cylinders, miscellaneous abandoned automobiles or automobile parts, electronics, fire extinguishers, materials that can be recycled as scrap metal, and concrete parking blocks (wheel stops), Styrofoam blocks, furniture, and metal wire and steel grates.

The Contractor shall ensure that the materials are disposed of in an appropriate manner, and to provide the Resident Engineer with documentation verifying the removal method and final destination of the various items prior to removal. The Contractor shall be solely and entirely responsible for compliance with all Federal, State and local laws, ordinances, regulations and directives with respect to the disposal of waste materials. In connection therewith the Contractor shall be solely and entirely responsible for obtaining all necessary permits, licenses or other authorizations so as not to delay the project and shall be responsible for the payment of all required fees and costs therefore, all without additional cost to the Department.

Basis of Payment. This work will be paid for at the contract lump sum price for DEBRIS REMOVAL.

Only the removal items within the project limits of this Contract shall be included in the cost of DEBRIS REMOVAL.

CONCRETE REMOVAL (SPECIAL)

This work shall be done according to Section 440 and 501 of the Standard Specifications and this Special Provision. This work shall consist of the removal and satisfactory disposal of a concrete slab foundation per area measurement, or concrete structures at the locations and basis of payments as noted in the contract plans.

The Contractor shall remove the concrete foundation and/ or concrete structure. All associated structural elements, shortwalls or foundations attached to the concrete foundation and/ or concrete structure both above ground and below grade shall be removed down to a plane a minimum of 1 ft below the bottom of the concrete foundation and/ or concrete structure, unless otherwise specified on the contract plans for minimum removal elevation or full removal . It shall be the responsibility of the Contractor to determine the thickness and volume of the concrete to be removed and the extent to which it is reinforced. No additional compensation will be allowed because of variations from the assumed thickness or from the thickness shown on the plans, or variations in the amount of reinforcement. Any reinforcement encountered shall be removed and disposed of properly without any additional compensation.

The Contractor shall remove any existing floor drains, sewers or drainage structures associated with the concrete foundation and/ or concrete structure at no additional cost to the contract.

Holes or voids created in the earth due to concrete removal shall be filled with FURNISHED EXCAVATION such that the location can be site graded and seeded and present a neat and clean appearance on completion of the project. The Contractor shall notify the Engineer upon completion of each individual removal activity which will require backfill, prior to any backfill activity. The method of backfill and compaction must be approved by the Engineer.

Unless specifically called out in the plans, existing utilities which are still located in the ground, including (but not limited to) power poles, light poles, utility structures, fire hydrants, water main, and sewers, shall be removed per other provisions in this contract, or BY OTHERS, and shall not be included in CONCRETE REMOVAL (SPECIAL). The Contractor shall note any such existing utilities which conflict with the concrete to be removed, and request direction from the Engineer prior to removal activities at these locations. Any damage to existing utilities by the Contractor shall be repaired by the Contractor at his own expense to the satisfaction of the Engineer.

Method of Measurement. CONCRETE REMOVAL (SPECIAL) for concrete foundations and/ or concrete slabs will be measured for payment in place, and the area computed in square yards of the horizontal surface of the concrete removal item.

Basis Of Payment. This work will be paid for at the contract unit price per square yard for CONCRETE REMOVAL (SPECIAL).

FURNISHED EXCAVATION for backfill shall be measured and paid for separately.

FENCE REMOVAL

Description. This item consists of removing and disposing of existing chain link fence or other residential fences at locations as shown on the plans and where directed by the Engineer. The chain link fence to be removed may also include barbed wire or razor ribbon attached to the top of the fence. The Contractor shall exercise care so as not to damage fence that is to remain. Existing posts shall be pulled and the hole backfilled with sand. Concrete foundations shall also be disposed of off-site.

Method of Measurement. This work will be measured in place in lineal feet of fence to be removed.

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

APPROACH SLAB REMOVAL

This work shall consist of the complete removal of existing approach slabs including HMA overlays, reinforcing bars, and sleeper slabs, at locations designated in the plans and in accordance with the applicable portions of Sections 440 and 501 of the Standard Specifications.

The Contractor shall remove the existing approach slabs in a manner so as not to damage the adjacent structures that are to remain.

Method of Measurement. Approach slab removal shall be measured for payment 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 APPROACH SLAB REMOVAL.

REMOVAL OF EXISTING STRUCTURES

Description. After construction of the proposed IL-104 Bridge over the Illinois River and after the IL-104 traffic is shifted on to the new bridge, the entire existing IL-104 Bridge over the Illinois River shall be removed in accordance with Section 501 of the Standard Specifications for Road and Bridge Construction, in compliance with the special provision for Maintenance of Navigation, all project permits, as noted below and as directed by the Engineer. The scope of this item shall also include removal and disposal of miscellaneous items appurtenant to the structure, including but not limited to bridge expansion joint materials and anchorages, reinforcing steel, railings, drainage system components, bearings, etc. Structure excavation, including in-stream and out-of-stream work, required for the removal of structures and the necessary backfilling shall be included in this item. Coordination with the removal and/or re-grading of the adjacent existing approach roadways shall also be included in this item.

Existing Plans. Available plans for the existing structure will be made available to the Contactor by the Department upon his/her written request to the Regional Engineer, Illinois Department of Transportation - District Six, 126 East Ash Street, Springfield, Illinois 62704. The completeness of these plans is not guaranteed and no responsibility is assumed by the Department for their accuracy. Information is furnished for whatever value may be derived by the Contractor, and is to be used solely at the Contractor's risk.

Submittals. Demolition plans, procedures and timelines shall be prepared and sealed by an Illinois Licensed Structural Engineer and submitted to the Engineer for review and approval. Such plans, procedures and timelines shall also be subject to review and approval of the IDOT Bureau of Bridges and Structures. Structural plans and procedures for any proposed temporary structures used to facilitate access shall be prepared and sealed by an Illinois Licensed Structural Engineer. (Refer to the Special Provision "Temporary Facilities Installed by Contractor.")

General Construction Requirements. Demolition debris in the river may cause changes in the river currents and drainage patterns. The Contractor shall not leave demolition debris in the river for more than 7 days.

The existing concrete deck shall be removed prior to structural steel removal in the spans over the river. The contractor shall take the necessary precautions to eliminate concrete from entering the river.

All concrete from the removal of the existing bridge in the river shall be removed from the river bed to the satisfaction of the Engineer.

Structure excavation required for removal of structures and the necessary backfilling shall be done in accordance with Section 502 of the Standard Specifications.

Tree removals required for the removal of existing bridge shall be approved in writing by the Engineer, and shall be performed according to Article 201.04 of the Standard Specification for Road and Bridge Construction

Excess dredged material shall not be used on site. It is to be removed and disposed of according to Article 202.03 of the Standard Specification for Road and Bridge Construction.

Traffic on the adjacent new IL-104 Bridge shall be maintained and protected during removal of the existing structure.

Method of Measurement. No measurement will be made for removal of existing structures.

Basis of Payment. This work will be paid for at the contract unit price per each for REMOVAL OF EXISTING STRUCTURES, NO. 1 which payment shall constitute full compensation for all labor, materials, tools and equipment required for removal and disposal of existing structure and incidental items, as detailed in the plans, described herein and as directed by the Engineer. Tree removals required for removal of existing bridge will not be paid for separately, but shall be in the cost of REMOVAL OF EXISTING STRUCTURES, NO. 1.

TEMPORARY FACILITIES INSTALLED BY CONTRACTOR

Description. This work shall consist of all labor, materials and equipment necessary to provide and subsequently remove temporary facilities required and installed by the contractor to enable access to work areas during construction.

General Construction Requirements. All means and methods employed for the installation and subsequent removal of temporary facilities to be installed by the contractor for access or for any other reason shall be in compliance with all project permits.

The plans for temporary facilities shall be submitted to the Engineer for review and acceptance prior to starting the work. Review, acceptance and/or comments by the Department, USACE, and the USCG shall not be construed to guarantee the safety or compliance with all applicable specifications, codes, or contract requirements, and shall neither relieve the Contractor of the responsibility and liability to comply with these requirements, nor create liability for the Department, USACE, nor the USCG. The Contractor is responsible for meeting all IDOT, USACE, and the USCG requirements. No additional compensation or time will be allowed for USACE or USCG restrictions. The plans shall be submitted 90 days prior to beginning work. The Contractor shall not proceed with work until written approval from each of the approval agencies has been received. Approval agencies are IDOT, USACE, and the USCG. Significant changes to the plans in the field must be approved by the Engineer.

The Contractor may elect to use a temporary work bridge or other temporary structure in the river and floodplains to facilitate construction. The construction of the River Bridge may take place during periods of high water. The Contractor shall consider the effects of scour on any temporary substructures and on the existing and proposed bridge foundations. The Contractor shall consider the effects of high flood waters on any temporary superstructures and ensure that any temporary means does not impact or adversely affect the existing or proposed substructures.

If temporary barges, work bridges, or platforms are used for access in the river, the Contractor shall keep the navigation waterway clear and open in compliance with the project permits.

After a temporary work bridge, platform or any other facility is no longer needed, it shall be removed per Article 513.08 of the Standard Specifications for Road and Bridge Construction.

Haul roads may constitute part of the temporary facilities installed and subsequently removed by the contractor. Haul roads shall be constructed with materials (i.e., coarse aggregate) meeting the requirements of Article 1004.04 of the Standard Specifications, except if pit run gravel is used, prior approval of the source may be required by the Engineer. Upon completion of the work, the haul road shall be removed and the floodplains returned to their original contours or the contours called for in the plans.

Submittals. If the Contractor elects to use a temporary work bridge, structural plans and procedures shall be prepared and sealed by an Illinois Licensed Structural Engineer (SE), and submitted to the Engineer for review and approval.

Basis of Payment. Temporary facilities installed by the contractor and their subsequent removal will not be measured nor paid for separately but shall be considered as included in the unit cost of the various related pay items in the contract.

MAINTENANCE OF NAVIGATION

This work shall consist of setting up work procedures, methods of protection, and scheduling work so as to maintain navigation through the bridge site to the satisfaction of the United States Coast Guard (USCG).

Materials. All lights, signs, and day markers shall conform to the applicable USCG regulations.

Construction Methods. The Contractor shall submit within four (4) weeks of award, a PLAN OF OPERATIONS that will be forwarded to the USCG by the Engineer. The PLAN OF OPERATIONS shall include a schedule of construction site activities.

The PLAN OF OPERATIONS which shall outline all of the operations affecting the waterway, including but not limited to, contractor activities to facilitate bridge construction and removal, which may include cofferdam installation, maintenance and removal, temporary causeway installation maintenance and removal (if applicable), steel erection, use of falsework, other obstructions or other temporary construction activities, demolition of the existing superstructure, demolition of the existing substructure elements, salvaging existing items, navigation light work, painting, concrete placement, or which will encroach upon navigation clearances that must be approved by the USCG.

The contractor shall so conduct his work that the free navigation of the waterway shall not be unreasonably interfered with; that the present navigation depths shall not be impaired; and that the channel through the structure shall be promptly cleared of all falsework, piling or other obstructions placed therein or caused by the bridge, to the satisfaction of the USCG.

The plan shall also include details of all floating equipment and/or vessels that will be utilized, including size (dimensions), location and length of time, including calendar dates that such equipment will be on the waterway. Location shall be interpreted to mean the positioning of any and all vessels or temporary aggregate causeway in the waterway with respect to the bridge and the navigable channel. Method of anchorage or stabilization of all floating equipment, and location of mooring sites if applicable, shall be specified in the PLAN OF OPERATIONS.

The USCG will review the plan and provide comment to the Engineer within 45 days of receipt of said plan.

All correspondence with the USCG shall be coordinated through the Engineer who will forward the material to the following Coast Guard office:

District Commander
Attention: Eric Washburn, Bridge Administrator
United States Coast Guard
Eighth U.S. Coast Guard District
1222 Spruce Street
St. Louis, MO 63103-2832
Phone: (314) 539-3900

All correspondence should reference the construction site as “Proposed IL Route 104 Bridge Replacement, Mile 71.3, Illinois Waterway.”

Activities in the Navigation Channel: A reasonable time limit will be allowed by the USCG for the Contractor’s operations in the navigation channel for activities including but not limited to clearing the navigation channel of demolition debris and restoring the navigation channel to full navigation capability. The amount of time allowed for work in, or closure of, the navigation channel for the Contractor’s activities in the river and navigation channel will be determined by the USCG after the USCG review of the PLAN OF OPERATIONS. River traffic cannot be detoured to another span. If the USCG requires revisions or additional information, the Engineer will direct the Contractor to furnish the additional information for resubmittal (by the Engineer) to the USCG.

Notification of Commencement of Work: The Contractor shall notify the Coast Guard two weeks prior to commencing any work that includes any of the activities in the PLAN OF OPERATIONS approved by the USCG.

The Contractor shall notify the USCG when construction work has reached a point where contractor construction activities in the PLAN OF OPERATIONS are complete, but in no case, later than 90 days after the bridge has been opened to highway traffic.

The purpose of this clause is to provide advance warning to commercial and other vessels utilizing the Illinois Waterway. Upon notification of schedule of work, the USCG will issue a NAVIGATIONAL ALERT for the Illinois Waterway. The USCG and the Engineer must be notified immediately of any change in anticipated work schedules. The USCG and the Engineer shall be promptly notified when work is completed and all floating equipment has been withdrawn from the waterway.

Execution of Work over a Navigable Waterway – United States Coast Guard Requirements:

a) Work shall be conducted in a manner that does not interfere with the free flow of navigation.
b) The navigational clearances meeting the approval of the USCG shall be maintained at all times. As a minimum, the existing navigational clearances shall be maintained at all times, unless otherwise approved by the USCG.
c) Navigable depths shall not be impaired at any time. The channel through the structure shall be promptly cleared of all falsework, piling, or all other obstructions placed therein or caused by the construction or demolition of the bridge. The Contractor shall continually work in a diligent manner to meet these requirements until obstructions are cleared. The Contractor shall cooperate with the USCG and other agencies including the U.S. Army Corps of Engineers in meeting the requirements to sweep the channel clean of construction and demolition debris. No temporary construction will be permitted within the clear navigation channel without USCG approval.
d) Safety measures shall be implemented and exercised at all times to prevent accidental dropping of spark producing and/or flame producing particles or objects onto barges and vessels. All welding, flame cutting, and any other tasks having spark-producing potential shall cease when vessels are passing beneath the bridge.
e) A contingency plan in the event of personnel absences or failure of equipment, and provisions for back up equipment and qualified personnel to operate the equipment shall be included when requested by the USCG.
f) Radio communication shall be provided to assure coordination and adjustment of work activities with the approach and passing of commercial vessels, and any other maritime vessels utilizing radio communication to coordinate passage through the site.
g) The contractor shall furnish and display such lights and danger signals upon all of his floating plant, buoys, and temporary and permanent construction as may be required for guiding and warning boats. The contractor shall in addition, comply with all applicable regulations of the USCG. While the existing or new navigation lights on the bridge are inoperative, the contractor shall display suitable temporary navigation lights in accordance with the PLAN OF OPERATIONS. The contractor is responsible for supplying any electrical power necessary for temporary lights and signals during construction. The contractor shall verify that all navigational lights are functional and unobstructed at the completion of each work day.
h) Floating equipment must yield the right of way to commercial vessels.
i) Floating equipment shall display lights and signals as specified by INLAND NAVIGATIONAL RULES of 1980, copies of which are available from the United States Coast Guard.
j) A PROJECT INFORMATION RECORD document shall be executed by the Contractor at the Preconstruction Meeting and a copy thereof shall be immediately submitted to the USCG office listed above. The USCG and the Engineer shall be promptly notified of any subsequent changes in the information provided thereon. A copy of the PROJECT INFORMATION RECORD document is included in these special provisions.

Basis of Payment. This item will be paid for at the contract lump sum price for MAINTENANCE OF NAVIGATION, which price shall be considered as full payment for all costs incurred by the Contractor in connection with the work as described herein.

PROMPTLY COMPLETE AND RETURN TO:

District Commander
Attn: Director - Western Rivers Operations
Eighth Coast Guard District
1222 Spruce Street
St. Louis, MO 63103-2823

Phone: (314) 539-3900
Fax: (314) 539-3755

PROJECT INFORMATION RECORD

NAME OF BRIDGE: IL-104, Meredosia, IL

RIVER/MILE: ILW / 71.3

PROJECT: Construct new IL-104 Bridge on offset alignment; then remove existing bridge

PERMITEE: Illinois Department of Transportation

RESIDENT ENGINEER OR INSPECTOR: _____

ADDRESS: _____

PHONE: _____ (Office) _____ (Cell)

CONTRACTOR'S PERSON-IN-CHARGE: _____

ADDRESS: _____

PHONE: _____ (Office) _____ (Cell)

SUBCONTRACTOR: _____

SUBCONTRACTOR'S PERSON-IN-CHARGE: _____

ALTERNATES: _____

START DATE: _____

EXPECTED COMPLETION DATE: _____

NAME OF WORK BOAT ON JOB: _____

RADIO CALL SIGN AND FREQUENCIES: _____

HOURS/DAYS OF OPERATION: _____

SIGNATURE: _____

ERECTION OF COMPLEX STEEL STRUCTURES

Description. In addition to the requirements of Article 505.08(e), the following shall apply.

The Contractor or sub-Contractor performing the erection of the structural steel is herein referred to as the Erection Contractor.

Erector Qualifications. The Erection Contractor shall be certified as an Advanced Certified Steel Erector (ACSE), by the AISC Certification Program. The Erection Contractor shall submit evidence of current ACSE certification to the Engineer with the submittal of the proposed erection plan.

Erection Plan. The Erection Contractor shall retain the services of an engineering firm, pre-qualified with the Illinois Department of Transportation in the Complex Structures category, for the completion of a project-specific erection plan. An Illinois Licensed Structural Engineer employed by this pre-qualified engineering firm, herein referred to as the Erection Engineer, shall sign and seal the erection plan, drawings, and calculations for the proposed erection of the structural steel.

The erection plan shall be complete in detail for all phases, stages, and conditions anticipated during erection. The erection plan shall include structural calculations and supporting documentation necessary to completely describe and document the means, methods, temporary support positions, and loads necessary to safely erect the structural steel in conformance with the contract documents and as outlined herein. The erection plans shall address and account for all items pertinent to the steel erection including such items as sequencing, falsework, temporary shoring and/or bracing, girder stability, crane positioning and movement, means of access, pick points, girder shape, permissible deformations and roll, interim/final plumbness, cross frame/diaphragm placement and connections, bolting and anchor bolt installation sequences and procedures, and blocking and anchoring or bearings. The Erection Contractor shall be responsible for the stability of the partially erected steel structure during all phases of the steel erection.

The erection plan and procedures shall be developed in accordance with the current AASHTO LRFD Bridge Construction Specifications, including interim specifications. Calculations for all items pertinent to the steel erection shall be in accordance with the 2012 AASHTO LRFD Bridge Design Specifications.

The surface of the levees shall be protected from damage due to construction activities and shall not be penetrated from temporary works or construction equipment.

The erection plans and procedures shall be submitted to the Engineer for review and acceptance prior to starting the work. Review, acceptance and/or comments by the Department, USACE, and the USCG shall not be construed to guarantee the safety or final acceptability of the work or compliance with all applicable specifications, codes, or contract requirements, and shall neither relieve the Contractor of the responsibility and liability to comply with these requirements, nor create liability for the Department, USACE, nor the USCG. The Contractor is responsible for meeting all IDOT, USACE, and USCG requirements. No additional compensation or time will be allowed for USACE or USCG restrictions. The erection plans and procedures shall be submitted 90 days prior to beginning work. The Contractor shall not proceed with work until written approval from each of the approval agencies has been received. Approval agencies are IDOT, USACE, and the USCG. Significant changes to the erection plan in the field must be approved by the Erection Engineer and accepted by the Engineer for the Department.

Basis of Payment: This work shall not be paid for separately but shall be included in the applicable pay items according to Art. 505.13 of the Standard Specifications.

HANGER ASSEMBLIES FOR TIED ARCH SPAN

Description
This section governs the supply, fabrication and erection of hanger assemblies for the Tied Arch span. Each hanger assembly consists of a structural strand with lower and upper sockets and associated pins, studs, nuts and other appurtenances.

Materials
Hanger Strand: Hangers shall be made up of helical steel wire galvanized structural strands, of the size indicated in the plans, conforming to the requirements of ASTM A 586, with Class A weight zinc coating on inner wires and Class C weight zinc coating on outer wires, and shall be pre-stretched. Strands shall be properly coiled or rolled on reels. Any kinked or damaged strand will be rejected by the Engineer. Straightening of bent wires will not be permitted.

a) Testing of Strand Wire: Tests of strand wire for physical requirements shall be conducted in accordance with ASTM A 586, Sections 7 and 8.

   The tests for ultimate strength shall be made on specimens cut from both ends of each single length or coil of zinc-coated wire. The Engineer or Engineer's inspector shall witness as many of these tests as may be necessary to satisfy the Engineer that the wire meets the requirements of these specifications. When requested by the Engineer, the Contractor shall, in the presence of the inspector, make check tensile tests of any coils selected at random by the inspector.

   The test for stress at 0.7 percent elongation shall be made on samples from at least 10 percent of the coils as manufactured. If the strength at 0.7 percent elongation as so determined falls below the required strength in any lot of wire, the inspector may require that all coils of such lot be tested and will reject all individual coils that do not meet strength requirements.

Tests for galvanizing (weight and adherence) shall be made on samples of not less than 5 percent of the coils of any lot of wire. If tests of any of these coils fail to meet the requirements, then tests shall be made of all of the coils in the lot. Unless at least 80 percent of the coils pass the test, the entire lot will be rejected. Any coil failing to meet requirements will be rejected.

b) Fabrication of Structural Strand: The steel wire shall be fabricated into structural strand in conformance with ASTM A 586. Inner wires shall have Class A weight zinc coating; outer wires shall have Class C weight zinc coating.

The strand shall be made on machines of sufficient size to insure good workmanship. Once the manufacture of the strand has been started, no changes shall be made as to the grade of wire, construction or lay of strand, or other factors that would affect the uniformity of the product.

All hanger strands shall be pre-stretched by applying a load equal to 50 percent of its specified minimum breaking strength. Testing for strength and modulus of elasticity shall be conducted in accordance with ASTM A 586.

The ends of the test pieces shall be socketed with sockets of a design similar to those to be used in the bridge. If the Engineer finds that the strength and elasticity have sufficient uniformity after six or more tests of pre-stretched strands have been made, one test may be made thereafter from each manufactured length of strand instead of one from each pre-stretched length. When examined visually, sockets used in the tests shall show no distress after testing. The strand shall show a well-defined and uniform elastic stretch and recovery under stressing.

Hanger Sockets: The design of the hanger sockets will be the contractor's responsibility. Sockets for hanger strands shall have sufficient capacity to develop the full specified minimum breaking strength of the strand. For each socket design, the adequacy of the strength of the socket, with its associated pins, studs, nuts and other appurtenances, shall be demonstrated by calculations and test data acceptable to the Engineer. The calculations shall be sealed by a Structural Engineer licensed in Illinois. All proposed materials and details shall be indicated in the shop drawings.

The lower sockets shall be Open Strand Sockets, 2400 series, as furnished by Clodfelter Bridge and Structures International, Inc. (CBSI), or approved equal. The sockets shall be fully annealed castings of ASTM A 148 steel, Grade 105-85. In addition to the tension tests required by ASTM A 148, Charpy Impact tests in accordance with ASTM A 781 S9 shall be conducted; Charpy V-notch test values shall be not less than 24 ft.-lbs. at 10 degrees F.

The upper sockets shall be Type 6 Anchor Sockets, as furnished by Clodfelter Bridge and Structures International, Inc. (CBSI), or approved equal. The sockets shall be fully annealed castings of ASTM A 148 steel, Grade 105-85.

All sockets and their associated pins, studs, nuts and other appurtenances shall be galvanized.

Certified test reports covering all the tests specified herein shall be furnished to the Engineer.

Fabrication of Hanger Assemblies: Hanger assemblies shall be fabricated by attaching sockets to strand in accordance with procedures submitted to the Engineer prior to fabrication, and as required to achieve the test results and tolerances specified herein.

a) Hanger Length: The contract plans show dimensions from center of tie to center of rib at each hanger location. The length of a hanger shall be defined as the distance between the center of the pin at the lower socket and a location defined by the Contractor at the upper socket. Hanger lengths corresponding to the dimensions indicated in the plans shall be determined by the contractor and shown on shop drawings, which shall be submitted to the Engineer for approval. Hanger lengths shall be determined corresponding to each of the load conditions indicated in the plans (unstressed, assembled, with steel dead load, and with full dead load).

   Upon completion of fabrication, the length of each hanger assembly shall be measured in the shop with a tensile load of 100 kips applied on the assembly. Based on these measurements, and the calculated correction for the elongation due to the 100-kip load, the contractor shall determine and mark indelibly the position of the nut at the upper socket that would correspond to the correct length between center of tie and center of rib in an unstressed condition. Additional markings shall be applied to ensure that the assembly can be erected with sockets in the same relative position as when the length was measured and the nut position marked.

   The measured lengths, methods of marking, and all length-related calculations shall be submitted to the Engineer for approval.

b) Attachment of Sockets to Strand: Lower and upper sockets shall be attached to the strand such that the correct unstressed hanger length is achieved, within a tolerance of ¼ inch.

   The wires of a strand, after being splayed in preparation for socketing, shall be cleaned of grease and other impurities by a controlled process that will assure no harm is done to the wire galvanizing coating. After socketing, the strand wires adjacent to the socket shall be re-lubricated.

   The basket of the socket shall be preheated to expel moisture and to prevent the molten zinc from congealing before it has completely filled the narrow lower end of the basket. Hanger assemblies will be rejected if the socketing procedure results in bare wires within the socket.

The zinc used to attach the sockets to the strand shall comply with ASTM Specifications B6, High Grade, or better. The molten zinc shall be placed at the lowest practical temperature so as to minimize the effect of heat on the strands. The zinc temperature at the time of pouring shall be recorded for each socket and furnished to the Engineer.

Certification shall be provided that the requirements of ASTM A 148 and B6 have been met.

c) Testing of Socket Attachment: In order to confirm the effectiveness of hanger socketing, the contractor shall prepare at least six test specimens of strand-socket assemblies for test purposes. Test specimens at least 25 strand diameters long, with sockets (randomly selected from those that are to be used in filling the contract order) attached to each end, shall be stressed to destruction in a suitable testing machine. The sockets used for these tests shall not be re-used in the structure. Under this test, the specimens shall develop the specified minimum breaking strength of the strand. Material and method of socketing shall be the same for both test specimens and actual bridge hanger assemblies. The sockets in every instance shall be of sufficient strength to produce failure in the strand material.

Certified test reports covering all the tests specified herein shall be furnished to the Engineer.

Erection

The installation of hangers shall be coordinated with the erection of arch ribs, ties, floor beams and other components and shall be included in the overall erection plan (see special provision for ERECTION OF COMPLEX STEEL STRUCTURES).

Hangers shall be erected with sockets in the same relative position as when assembly lengths were measured, and with the nuts at the upper sockets in the positions marked to provide correct lengths (see Hanger Length section).

After all steel in the span has been erected, and again after all concrete dead load is in place, the tension in all hanger cables shall be measured by the Contractor and reported to the Engineer. The Contractor's method of measuring cable tension shall have the approval of the Engineer.

Basis of Payment

HANGER ASSEMBLIES FOR TIED ARCH SPAN, furnished, fabricated and erected in place, including all additional requirements set forth herein and as shown on the contract plans, will be paid for at the lump sum price for HANGER ASSEMBLIES FOR TIED ARCH SPAN.

AESTHETIC TREATMENTS

Description This work shall consist of furnishing and erecting architectural MSE wall pilasters and precast architectural panels at the Washington Street Bridge abutments. The architectural treatment of the MSE wall pilasters and the precast architectural panels shall include patterns, depth of relief, surface texture and color for MSE wall pilasters and precast architectural panels as detailed in the plans and specified herein.

General Requirements The MSE wall pilasters shall be part of the MSE wall system and shall be designed to meet the requirements specified for the Mechanically Stabilized Earth Retaining Walls. The precast architectural panels shall be provided according to the plan details; the Contractor shall be responsible for designing and furnishing the connections and anchors necessary to attach the panels to the abutments. Panels shall not be attached to the bridge or wall parapets. Only cast in concrete or drilled-in adhesive anchors will be allowed. The anchors shall meet the minimum edge distance requirements. The Contractor shall provide shop drawings of all aesthetic treatments. Formwork for aesthetic treatment of the MSE wall pilasters and the precast architectural panels shall be of type that produces uniform results consistent in both pattern, depth of relief and surface texture. The completed surfaces shall be free of blemishes, discolorations, surface voids and conspicuous form marks to the satisfaction of the Engineer. The Contractor shall be responsible to coordinate the aesthetic treatments of all components to meet the design aesthetic criteria described herein and in the plans.

Shop Drawings The producer shall submit complete shop drawings to the Engineer according to Article 1042.03(b) of the Standard Specifications no later than 90 days prior to beginning fabrication of the precast architectural elements. No work or ordering of materials for the structure shall be done by the Contractor until the submittal has been approved in writing by the Engineer. All submittals shall be sealed by an Illinois Licensed Structural Engineer and shall include all details, dimensions, quantities and cross sections necessary to construct the precast architectural panels.

Sample Test Panels Sample test panels shall be constructed to demonstrate the Contractor's workmanship for all form liner textures and patterns as shown on the plans. The architectural surface treatment of the finished work shall achieve the same final effect as demonstrated on the approved sample test panels. The materials used in the construction of the test panels shall be in accordance with all standards as listed in the project specifications and plans.

One sample test panel shall be supplied for the MSE wall pilaster panels. The test panel shall be the size and shape of a full size panel proposed to be used in the MSE wall pilasters. One sample test panel shall be produced for the precast architectural panels. The minimum size of the sample test panel shall be 4 feet x 4 feet x 6 inches. The architectural sample panel shall have the texture and finish same as the lower MSE wall pilaster panels. The sample test panels shall be delivered to the project for inspection by the Engineer. Following acceptance of the panels by the Engineer, the Contractor shall stain the sample test panels to achieve the color shown on the plans or selected by the Engineer.

Approval of the sample test panels by the Engineer shall be obtained prior to starting production of the MSE wall pilaster panels and precast architectural panels to be used on the project. Approval of the sample test panels by the Engineer shall serve as a standard of comparison with respect to texture, color and overall appearance. The sample test panels shall be kept on the project site until the MSE wall pilasters and architectural panels are completed including the staining. When the Engineer gives the approval to dispose of the sample test panels, the Contractor shall remove and properly dispose of the sample test panels.

Concrete Stain. The concrete stain shall be a two-coat, pigmented acrylic resin system which penetrates into the panel surface to provide water repellency, a semi-opaque aesthetic color and shall resist deterioration from salt, water, acid, alkali, fungi, sunlight or weathering. The concrete stain shall form a breathable film allowing trapped moisture vapor to safely migrate through the coating without blistering or peeling. Prior to the start of work, a manufacturer's certification shall be furnished to the Engineer from an authorized representative stating that the stain being furnished is in accordance with this special provision. Any change in sources requires a re-submittal of the certification. The concrete stain shall produce the colors shown on the plans or selected by the Engineer.

The concrete stain applicator shall have a minimum of five years demonstrated experience in applying concrete stains. The contractor shall submit appropriate experience, job listings, and project photographs from previous work.

Application procedures and absorption rates shall be as recommended by the manufacturer in writing to achieve color uniformity.

The concrete stain shall be delivered in original and sealed containers, clearly marked with the manufacturer's name, brand name, type of material, batch number, and date of manufacture. The concrete stain materials shall be stored within the temperature range recommended by the manufacturer.

Temperature and relative humidity conditions during time of concrete stain application shall be per manufacturer's application recommendations. Do not apply materials under rainy conditions or within three days after surfaces become wet from rainfall or other moisture. Do not apply when weather is foggy or overcast. Precautions shall be taken 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.

The schedule of the concrete staining of the MSE wall pilasters and architectural panels shall be coordinated with the adjacent grading work to ensure that the color staining is completed to one foot below the final earth grade at the face of the wall. Final grading against the stained panels shall not be completed until the stain has cured for the amount of time recommended by the manufacturer.

Prior to application of the concrete stain materials, the concrete shall be cleaned and prepared according to the stain manufacturer's recommendations.

The stain shall be thoroughly mixed in accordance with the manufacturer's directions prior to application. The material shall not be thinned. Materials shall be applied at the rate recommended by the manufacturer. Completed stained concrete surfaces shall be free of blemishes, discoloration, surface voids, and form marks.

Method of Measurement. The MSE wall pilaster panels will be measured according to special provision for MECHANICALLY STABILIZED EARTH RETAINING WALLS. The architectural panels will be measured per each precast architectural panel furnished and installed as detailed on the plans and specified herein.

Basis of Payment. The MSE wall pilaster panels will be paid according to special provision for MECHANICALLY STABILIZED EARTH RETAINING WALLS, and the precast architectural panels will be paid for at the contract unit price per EACH for ARCHITECTURAL PRECAST CONCRETE PANEL. The unit cost for each item shall include all materials, form liners, connecting brackets, anchors, concrete stain, equipment, labor, and any other incidental work necessary to complete these items. No separate payment will be made for furnishing, disposing of, and staining of the sample test panels.

PROTECTION OF EXISTING DRAINAGE FACILITIES DURING CONSTRUCTION

All existing drainage structures are to be kept free of any debris resulting from construction operations. All work and material necessary to prevent accumulation of debris in the drainage structures will be considered as incidental to the contract. 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. Any minor ditch grading, modifications to existing drainage structures to ensure proper roadway drainage, culverts under temporary drives, and any bulkheading as directed by the engineer necessary to provide for the interim drainage for construction staging will not be paid for separately but shall be included in the cost of earth excavation and erosion control. Should reconstruction or adjustment of a drainage structure be required by the Engineer in the field, the necessary work and payment shall be done in accordance with Section 602 and Article 104.02 respectively of the Standard Specifications.

During construction if the Contractor encounters or otherwise becomes aware of any sewers, underdrains or field drains within the right-of-way other than those shown on the plans, he shall so inform the Engineer who shall direct the work necessary to maintain 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 have directed the replacement of a facility, the necessary work and payment shall be done in accordance with Sections 550 and 601 and Article 104.02 respectively of the Standard Specifications.

BOX CULVERTS TO BE CLEANED

Description. This work shall consist of removing materials from the flowline of existing box culverts.

Existing box culverts as designated on the plans, shall be cleaned of any accumulation of silt, debris, or foreign material of any kind and shall be free from such accumulations at the time of final inspection.

Materials. Materials removed shall be disposed of as specified in Article 202.03 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per foot for BOX CULVERTS TO BE CLEANED.

PIPE CULVERTS TO BE CLEANED

Description. This work shall consist of removing materials from the flowline of existing pipe culverts.

Existing pipe culverts as designated on the plans, shall be cleaned of any accumulation of silt, debris, or foreign material of any kind and shall be free from such accumulations at the time of final inspection.

Materials. Materials removed shall be disposed of as specified in Article 202.03 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per foot for PIPE CULVERTS TO BE CLEANED of the size specified.

PLUG EXISTING CULVERTS

This work shall consist of plugging both ends and filling the existing box culvert as shown on the plans and as directed by the Engineer.

The culvert shall be cleaned of debris and sediment accumulated in the culvert with disposal of the material in accordance with Article 202.03 of the Standard Specifications. After the culvert is cleaned, the ends of the culvert shall be partially plugged. Controlled Low-Strength Material (CLSM) according to Section 1019 of the Standard Specifications shall then be pumped into the culvert to fill the void.

This work shall be paid for at the contract unit price per each for PLUG EXISTING CULVERTS, which price shall include all labor and equipment to clean, plug, and fill the culvert. Controlled Low-Strength Materials will not be paid for separately, but shall be considered included in the cost of PLUG EXISTING CULVERTS.

PLUG EXISTING STORM SEWERS

This work shall consist of plugging both ends and filling the existing storm sewers as shown on the plans and as directed by the Engineer.

The pipe shall be cleaned of debris and sediment accumulated in the culvert with disposal of the material in accordance with Article 202.03 of the Standard Specifications. After the pipe is cleaned, the ends of the pipe shall be partially plugged. Controlled Low-Strength Material (CLSM) according to Section 1019 of the Standard Specifications shall then be pumped into the storm sewer to fill the void.

This work will be measured for payment in place and the volume computed in cubic yards.

This work shall be paid for at the contract unit price per cubic yard for PLUG EXISTING STORM SEWERS, which price shall include all labor and equipment to clean, plug, and fill the pipe. Controlled Low-Strength Materials will not be paid for separately, but shall be considered included in the cost of PLUG EXISTING STORM SEWERS.

REMOVE EXISTING FLARED END SECTION

Description: This work shall consist of the removal and disposal of existing precast flared end sections, at the locations shown on the plans and in accordance with the applicable portions of Section 501 of the Standard Specifications and as directed by the Engineer.

Basis of Payment: This work will be paid for at the contract unit price per Each for REMOVE EXISTING FLARED END SECTION.

STORM SEWER (WATER MAIN REQUIREMENTS)
Effective: September 1, 2008

This work shall consist of constructing a storm sewer to meet water main standards, as required by the IEPA or when otherwise specified. The work shall be performed in accordance with applicable parts of Section 550 of the Standard Specifications, applicable sections of the current edition of the IEPA Regulations (Title 35 of the Illinois Administrative Code, Subtitle F, Chapter II, Section 653.119), the applicable sections of the current edition of the Standard Specifications for Water and Sewer Main Construction in Illinois, and as herein specified.

This provision shall govern the installation of all storm sewers which do not meet IEPA criteria for separation distance between storm sewers and water mains. Separation criteria for storm sewers placed adjacent to water mains and water service lines are as follows:

1. Water mains and water service lines shall be located at least 10 feet (3.05 meters) horizontally from any existing or proposed drain, storm sewer, or sewer service connection.

2. Water mains and water service lines may be located closer than 10 feet (3.05 meters) to a sewer line when:

    a) local conditions prevent a lateral separation of 10 feet (3.05 meters), and

    b) the water main or water service invert is 18 inches (460 mm) above the crown of the sewer, and

    c) the water main or water service is either in a separate trench or in the same trench on an undisturbed earth shelf located to one side of the sewer.

3. A water main or water service shall be separated from a sewer so that its invert is a minimum of 18 inches (460 mm) above the crown of the drain or sewer whenever water mains or services cross storm sewers, sanitary sewers or sewer service connections. The vertical separation shall be maintained for that portion of the water main or water services located 10 feet (3.05 meters) horizontally of any sewer or drain crossed.

When it is impossible to meet 1, 2, and 3 above, the storm sewer shall be constructed of concrete pressure pipe, slip-on or mechanical joint ductile iron pipe, or PVC pipe equivalent to water main standards of construction. Construction shall extend on each side of a crossing until the perpendicular distance from the water main or water service to the sewer or drain line is at least 10 feet (3.05 meters). Storm sewer meeting water main requirements shall be constructed of the following pipe materials:

Concrete Pressure Pipe

Concrete pressure pipe shall conform to the latest ANSI/AWWA C300, C301, C302, or C303.

Joints shall conform to Article 41-2.07B of the “Standard Specifications for Water and Sewer Main Construction in Illinois.”

Ductile Iron Pipe

Ductile-iron pipe shall conform to ANSI A 21.51 (AWWA C151), class or thickness designed per ANSI A 21.50 (AWWA C150), tar (seal) coated and/or cement lined per ANSI A 21.4 (AWWA C104), with a mechanical or rubber ring (slip seal or push on) joints.

Joints for ductile iron pipe shall be in accordance with the following applicable specifications.

1.	Mechanical Joints	-	AWWA C111 and C600
2.	Push-On Joints	-	AWWA C111 and C600

Plastic Pipe

Plastic pipe shall be marked with the manufacturer's name (or trademark); ASTM or AWWA specification; Schedule Number, Dimension Ratio (DR) Number or Standard Dimension Ratio (SDR) Number; and Cell Class. The pipe and fittings shall also meet NSF Standard 14, and bear the NSF seal of approval. Fittings shall be compatible with the type of pipe used. The plastic pipe options shall be in accordance with the following:

1. Polyvinyl Chloride (PVC) conforming to ASTM D 1785. Schedule 80 is the minimum required for all pipe sizes, except when the pipe is to be threaded, and then it shall be Schedule 120. It shall be made from PVC compound meeting ASTM D 1784, Class 12454.
2. Polyvinyl Chloride (PVC) conforming to ASTM D 2241. A minimum wall thickness of SDR 26 is required for all pipe sizes (Note: The lower the SDR number, the higher the wall thickness and pressure rating). It shall be made from PVC compound meeting ASTM D 1784, Class 12454.
3. Chlorinated Polyvinyl Chloride (CPVC) conforming to ASTM F 441. A minimum of Schedule 80 is required for all pipe sizes. Threaded joints are not allowed. It shall be made from CPVC compound meeting ASTM D 1784, Class 23447.
4. Chlorinated Polyvinyl Chloride (CPVC) conforming to ASTM F 442. A minimum wall thickness of SDR 26 is required for all pipe sizes (Note: The lower the SDR number, the higher the wall thickness and pressure rating). It shall be made from CPVC compound meeting ASTM D 1784, Class 23447.
5. Polyvinyl Chloride (PVC) conforming to ANSI/AWWA C900. A minimum of wall thickness of DR 25 is required for all pipe sizes (Note: The lower the DR number, the higher the wall thickness and pressure rating). It shall be made from PVC compound meeting ASTM D 1784, Class 12454.
6. Polyvinyl Chloride (PVC) conforming to ANSI/AWWA C905. A minimum of wall thickness of DR 26 is required for all pipe sizes (Note: The lower the DR number, the higher the wall thickness and pressure rating). It shall be made from PVC compound meeting ASTM D 1784, Class 12454.

Joining of plastic pipe shall be by push-on joint, solvent welded joint, heat welded joint, flanged joint, or threaded joint, in accordance with the pipe manufacturer's instructions and industry standards. Special precautions shall be taken to insure clean, dry contact surfaces when making solvent or heat welded joints. Adequate setting time shall be allowed for maximum strength.

Elasotmeric seals (gaskets) used for push-on joints on plastic pipe shall comply with ASTM F477.

Solvent cement shall be specific for the plastic pipe material and shall comply with ASTM D 2564 (PVC) or ASTM F 493 (CPVC) and be approved by NSF.

For water-sewer line crossings only, storm sewer meeting water main requirements may also be constructed of reinforced concrete sewer pipe. The pipe shall conform to ASTM C 76 with a joint and rubber gasket meeting ASTM C 443. The joint shall meet the leakage performance test in ASTM C 443. The pipe manufacturer must demonstrate to Illinois Department of Transportation personnel that the joints pass the leakage performance test prior to installation of the pipe. The pipe class shall meet the requirements of Section 550 of the Standard Specifications for Road and Bridge Construction.

This work will be measured and paid for at the contract unit price per foot (meter) for STORM SEWER (WATER MAIN REQUIREMENTS) of the diameter specified.

DUCTILE IRON FORCE MAIN

Description: This work shall consist of constructing ductile iron force mains that connect to the discharge pipes at the pump station, as shown on the drawings. Piping shall include all necessary fittings, gaskets, etc. as required.

Materials: The force main materials shall be limited to the following:

Ductile Pipe and Fittings: The ductile iron pipe shall meet the requirements of ANSI A 21.51 (AWWA C151). The class or thickness design shall be according to ANSI A 21.50 (AWWA C150). The ductile iron pipe shall be seal coated and/or cement lined according to ANSI A 21.4 (AWWA C104). The ductile iron pipe shall be mechanical jointed conforming to ANSI A 21.53/AWWA C 153 and ANSI A21.4/AWWA C 104. Fittings shall have the same linings and coatings as the pipe. All ductile iron pipe & fittings shall receive polyethylene encasement per ANSI A 21.5 (AWWA C105).

Mechanical Restrained Joints – Force mains and fittings shall be installed with self-restraining mechanical joints that provide axial thrust restraint to prevent pipe joint separation. All joint restraints shall be EBAA IRON MEGALUG 1100 series for ductile iron pipe, or approved equal.

General: The work shall be performed according to the current editions of Standard Specifications for Water and Sewer main Construction in Illinois and IDOT Standard Specifications for Road and Bridge Construction.

All fittings required to connect the ductile iron force mains shall be included in the cost of the ductile iron force main.

Method of Measurement: This work will be measured in lineal feet along the centerline of the pipe, and the measurement shall extend through fittings.

Basis of Payment: This work will be paid for at the contract unit price per foot for STORM SEWER, DUCTILE IRON PIPE, CLASS 52, of the specified size, regardless of depth, which price shall include all equipment, materials, accessories, including polyethylene encasement of ductile iron pipe and fittings, excavation, bedding and initial pipe covering, and labor necessary to complete the work as specified. Trench backfill with granular materials above the granular pipe bedding and cover material shall be paid for according to Article 208.04 of the IDOT Standard Specifications.

CAST IRON PIPE

Description. This work shall consist of furnishing and installing storm sewer cast iron pipe below the pavement according Section 560 of the Standard Specification and as detailed in the plans.

Materials. Materials shall be according to Article 560.02 of the Standard Specifications.

Installation. Installation shall be according to Article 560.03 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per foot for CAST IRON PIPE, of the diameter specified. Trench backfill will be paid according to Article 208.04.

CAST IRON PIPE ATTACHED TO STRUCTURE

Description. This work shall consist of furnishing and installing a cast iron drainage pipe, including all piping, tee, elbow, fittings, support hangers, support brackets, inserts and bolts, as shown on the plans and specified herein.

Materials. Cast iron pipe, tee, elbow and fittings shall be according to Article 1006.20 of the Standard Specifications.

All pipe supports and associated hardware shall be shall be as detailed in the plans, and shall be hot dip galvanized according to AASHTO M 232 (M 232M).

Installation. All pipe, tee, elbow and fittings shall be handled and installed according to guidelines and procedures recommended by the manufacturer or supplier of the material.

The connections of pipes, tee and fittings, shown on the plans to facilitate future removal for maintenance cleanout or flushing, shall be made with a threaded, gasketed coupler or a bolted gasketed flange system.

Runs of pipe shall be supported at spacings not exceeding those recommended by the manufacturer of the pipe. Supports that have point contact or narrow supporting areas shall be avoided. A minimum strap width for hangers shall be 1 1/2 in. (40 mm) for all pipe under 12 in. (300 mm) in diameter. Straps shall have 120 degrees of contact with the pipe.

Method of Measurement. This work will be measured for payment in feet in place. Measurements will be made along the centerline of the pipe between limits shown in plans, including bends and tees.

Basis of Payment. This work will be paid for at the contract unit price per foot for CAST IRON PIPE ATTACHED TO STRUCTURE, of the diameter as specified. The cost shall include furnishing and installing all piping, tee, elbow, fittings, support hangers, support brackets, inserts and bolts as needed for complete installation of drainage pipe.

ADJUSTMENTS AND RECONSTRUCTIONS
Effective: March 15, 2011

Revise the first paragraph of Article 602.04 to read:

"602.04 Concrete. Cast-in-place concrete for structures shall be constructed of Class SI concrete according to the applicable portions of Section 503. Cast-in-place concrete for pavement patching around adjustments and reconstructions shall be constructed of Class PP-1 concrete, unless otherwise noted in the plans, according to the applicable portions of Section 1020."

Revise the third, fourth and fifth sentences of the second paragraph of Article 602.11(c) to read:

"Castings shall be set to the finished pavement elevation so that no subsequent adjustment will be necessary, and the space around the casting shall be filled with Class PP-1 concrete, unless otherwise noted in the plans, to the elevation of the surface of the base course or binder course. HMA surface or binder course material shall not be allowed. The pavement may be opened to traffic according to Article 701.17(e)(3)b."

Revise Article 603.05 to read:

"**603.05 Replacement of Existing Flexible Pavement.** After the castings have been adjusted, the surrounding space shall be filled with Class PP-1 concrete, unless otherwise noted in the plans, to the elevation of the surface of the base course or binder course. HMA surface or binder course material shall not be allowed. The pavement may be opened to traffic according to Article 701.17(e)(3)b."

Revise Article 603.06 to read:

"**603.06 Replacement of Existing Rigid Pavement.** After the castings have been adjusted, the pavement and HMA that was removed, shall be replaced with Class PP-1 concrete, unless otherwise noted in the plans, not less than 9 in. (225 mm) thick. The pavement may be opened to traffic according to Article 701.17(e)(3)b.

The surface of the Class PP concrete shall be constructed flush with the adjacent surface."

Revise the first sentence of Article 603.07 to read:

"**603.07 Protection Under Traffic.** After the casting has been adjusted and the Class PP concrete has been placed, the work shall be protected by a barricade and two lights according to Article 701.17(e)(3)b."

SANITARY MANHOLE ADJUSTMENTS AND RECONSTRUCTIONS

This work shall be done in accordance with Section 602 of the Standard Specifications and shall consist of the adjustment or reconstruction of sanitary manholes. Non-hardening butyl rubber mastic sealant; minimum thickness 1.4-inch, shall be used between adjusting rings in place of mortar, or as required by the Owner of the Sanitary Sewer. In locations where existing external frame seals exist, it shall be removed and reinstalled. In locations where internal frame seals exist, it shall be removed and disposed of and an external frame seal shall be installed. In locations where there are no existing frame seals, an external frame seal shall be installed. The installation of the external frame seal will not be paid for separately and will be considered included in this pay item.

The External Frame seal shall consist of the following:

A. Provide frame seals consisting of a flexible external rubber sleeve and extension and stainless steel compression bands.

B. Rubber sleeve and extension:

1. Provide rubber sleeve and extension complying with ASTM C923.
2. Comply with a minimum 1500 psi tensile strength, maximum 18 percent compression set and a hardness (durameter) of 48±5.
3. Provide sleeve with a minimum thickness of 3/16-inch and unexpanded vertical heights of 6 or 9 inches.

C. Provide extension having a minimum thickness of 3/16-inch.

D. Compression band:

1. Provide compression band to compress the sleeve against the manhole.
2. Use 16 gauge stainless steel conforming to ASTM A240 Type 304 with no welded attachments and having a minimum width of 1-inch.
3. Make a watertight seal having a minimum adjustment range of 2 diameter inches.
4. Provide stainless steel screws, bolts, and nuts conforming to ASTM F593 and 594, Type 304.

E. Or as required by the Owner of the sanitary sewer system.

The External Frame Seal shall be installed as follows:

A. Install external rubber gasket on the manhole frame and chimney.

1. Provide watertight gasket to eliminate leakage between the frame and each adjusting ring down to and including cone section.

B. Clean surface and prepare the lower 2 inches of the manhole frame and exterior of all adjusting rings and cone section/corbel surfaces.

1. Realign frame on adjusting rings or corbel as required.

C. Repair and apply mortar grout to the adjusting rings as required to provide a smooth, circular surface for the rubber gasket.

D. Install rubber gasket in accordance with manufacturer's recommendations.

1. Field verify for suitable dimensions and layout before installation.
2. Utilize sealing caulk where required.

E. Or as required by the Owner of the sanitary sewer system.

Basis of Payment. This work will be paid for at the contract unit price per each for SANITARY MANHOLES TO BE ADJUSTED or SANITARY MANHOLES TO BE RECONSTUCTED, which price shall include all of the above.

TEMPORARY CONNECTION TO EXISTING STORM SEWER

Description: This work shall consist of connecting proposed storm sewers to existing storm sewers at locations as shown on the plans or as directed by the Engineer, in accordance with the applicable portions of Section 550 of the Standard Specifications and the details shown in the plans. The work shall include storm sewer replacement with prefabricated “T” or “Y” sections, where required, and proposed lateral connection to an existing sewer or drainage structure as shown on the plans.

Basis of Payment: This work will be paid for at the contract unit price per each for TEMPORARY CONNECTION TO EXISTING STORM SEWER, which price shall be payment in full for all labor, equipment and materials necessary to complete the work as specified herein.

TEMPORARY END SECTION

Description: This work shall consist of the construction and removal of temporary end sections as shown on the plans and in accordance with the applicable portions of Section 542 of the Standard Specifications and as directed by the Engineer.

The removal of the Temporary End Section will be considered included in the item cost and shall conform to Section 551 of the Standard Specifications.

Materials: The temporary end section shall be metal and shall conform to Section 1006.01 of the Standard Specifications.

Basis of Payment: This work will be paid for at the contract unit price per each for TEMPORARY END SECTION.

Removal of the temporary end section will be not be paid separately but included in the contract unit price for TEMPORARY END SECTION.

DRYWELL

Description. This work shall consist of supplying and constructing drywells including the cone, fabric, stone, frame and grate, and adjusting rings if necessary, according to Section 602 of the Standard Specifications and as shown on the plans.

Materials. Add the following to Article 602.02 of the Standard Specifications.

(q) Coarse Aggregate……1004
(r) Filter Fabric……1080.03

Method of Measurement. DRYWELL will be measured for payment per each, where each is defined as one complete structure.

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

TYPE F INLET BOX, STANDARD 610001 (SPECIAL)

Description. This work shall consist of supplying and constructing a Type F inlet box with shoulder curb, according to Section 610 of the Standard Specifications and as shown on the plans.

Method of Measurement. TYPE F INLET BOX, STANDARD 610001 (SPECIAL) will be measured for payment per each, where each is defined as one complete structure.

Basis of Payment. This work will be paid for at the contract unit price per each for TYPE F INLET BOX, STANDARD 610001 (SPECIAL). The cost of the shoulder curb shall be included in the cost of the TYPE F INLET BOX, STANDARD 610001 (SPECIAL).

UNDERGROUND STORAGE CHAMBER

Description: This work shall consist of preparing the design, furnishing materials, excavation and construction of underground storage chamber to the lines, grades and dimensions shown in the contract plans and as directed by the Engineer. This work consists of, but not limited to, excavation, excavation bracing system, bailing, draining and pumping of excavation, construction of foundation slab, installation of storage chamber and access manholes, constructing storm sewer connection, and backfilling to the bottom of the granular subbase for the roadway above, as shown on the plans, or as directed by the Engineer. Contractor shall submit detailed shop drawings for approval by the Engineer. The procurement of materials or construction of the chamber shall not commence until shop drawings are approved by the Engineer.

General: The underground storage chamber shall consist of prefabricated modules and select fill. The material, fabrication and construction shall comply with this Special Provision and the requirements specified by the supplier of the chamber system selected by the Contractor.

The storage chamber shall be one of the following pre-approved treatment systems:

- StormTrap by StormTrap, LLC
- ConSpan by Contech Engineered Solutions
- Storm Capture by Old Castle

The excavation bracing system shall meet the requirements specified in special provision for Braced Excavation (Special).

Submittals: The contractor shall submit complete design computations and shop drawings to the Engineer according to Article 105.04 of the Standard Specifications no later than 90 days prior to beginning construction of the storage chamber. For precast concrete products, the requirements of Article 1042.03(b) shall also apply. No work or ordering of materials for the chamber shall be done by the Contractor until the submittal has been approved in writing by the Engineer. All submittals shall be sealed by an Illinois Licensed Structural Engineer and shall include all details, dimensions, quantities and cross sections necessary to construct the chamber and shall include, but not limited to, the following items:

a. Plan, elevation and cross-section sheets(s) for each of the following:

    1) A plan view of the chamber indicating the offsets from the construction baseline to each corner of the chamber as well as the top elevation of the chamber. The plan view shall also show the construction limits for installing the precast modules. The centerline shall be shown for all drainage structures, access openings and pipes connecting in to the chamber.
    2) A listing of the summary of quantities shall be provided on the elevation sheet.
    3) Typical cross-section(s) showing the precast module, porous granular backfill, right-of-way limits, including excavation limits and elevation relationship between existing ground conditions and the finished grade line.
    4) All general notes required for constructing the wall as well as the locations of lifting devices and/or support points in the precast modules shall be indicated.

b. All typical modules should be detailed. All details shall show all dimensions necessary to cast and construct each type of module, all reinforcing steel in the module, and the location of any shear key or connection devices.

The initial submittal shall include shop drawings and calculations. No work or ordering of materials for the structure shall be done until the submittal has been approved by the Engineer.

Materials: The underground storage chamber shall conform to the following:

(u) Steel connection hardware shall be galvanized according to AASHTO M 232 or AASHTO M 111 as applicable.
(v) All precast concrete modules shall be manufactured with Class PC concrete with a minimum compression strength of 6,000 psi at 28 days, and according to Section 504, Article 1042.02, Article 1042.03 and the following requirements:
    1) The minimum panel thickness shall be 6 in.
    2) The minimum reinforcement bar cover shall be 1 ½ in.
    3) The panel reinforcement shall be epoxy coated according to 1006.10 (a)(2).
    4) Angular distortion with regard to the height of the panel shall not exceed 0.2 in. in 5 ft.
    5) Surface defects on the formed surfaces measured on a length of 5 ft. shall not be more than 0.1 in.
(w) Reinforcing steel shall be according to ASTM A 615, Grade 60. Cover for reinforcing steel bars shall be a minimum of 2”.

(x) All joints between modules shall be made water tight.
(y) Joint sealer shall be according to ASTM C 990, 1 inch in diameter, preformed mastic joint sealer.
(z) Joint Wrap shall be 8 inch wide sealant with protective release paper.
(aa) The backfill material shall be porous granular backfill conforming to article 1004.05 of the Standard Specifications.
(bb) Soil Reinforcement: If soil reinforcement is required the Contractor shall submit a manufacturer's certification for the soil reinforcement properties which equals or exceeds those required in the design computations. The soil reinforcement shall be manufactured from high density polyethylene (HDPE) uniaxial or polypropylene biaxial resins or high tenacity polyester fibers with a PVC coating, stored between -20 and 140 F (-29 and 60 C) The following standards shall be used in determining and demonstrating the soil reinforcement capacities:

ASTM D638 Test Method for Tensile Properties of Plastic
ASTM D1248 Specification for Polyethylene Plastics Molding and Extrusion Materials
ASTM D4218 Test Method for Carbon Black Content in Polyethylene Compounds
ASTM D5262 Test Method for Evaluating the Unconfined Tension Creep Behavior of Geosynthetics
GG1-Standard Test Method for Geogrid Rib Tensile Strength
GG2-Standard Test Method for Geogrid Junction Strength
GG4-Standard Practice for Determination of the Long Term Design Strength of Geogrid
GG5-Standard Practice for Evaluating Geogrid Pullout Behavior

Design Criteria:

The design shall be according to the Precast Concrete Modular Stormwater Detention: AASHTO Ultimate Strength Design Method except as modified herein. The chamber supplier shall be responsible for all external stability aspects of the chamber design (including bearing pressure, uplift and stability of excavation).

The excavation shall be performed using excavation bracing system so as to limit the excavation within 2 feet from the outside face of the storage chamber.

The minimum structural design loading shall be according to ASTM C 857. The storage chamber shall be designed for AASHTO HS-20 live loading.

The total cover shall be 2'-0" minimum and 4'-6" maximum.

The maximum allowable soil pressure is 4,000 psf.

External loads, such as those applied through structural foundations, from traffic or railroads, slope surcharge etc., shall be accounted for in the external stability design. The presence of all appurtenances behind, in front of, mounted upon, or drainage structures connecting into said chamber, utilities, structure foundation elements or other items shall be accounted for in the external stability design of the chamber walls.

Coulomb's lateral earth pressure theory shall be used to calculate the vertical and horizontal forces acting on all faces of the precast modules.

The overturning calculations shall assume no more than 80 percent of the soil dead load within the precast modules available to resist overturning forces. Sliding calculations shall consider sliding both across the base and of the base across the foundation soils. The factors of safety against sliding and overturning must be no less than 1.5 and 2.0, respectively, and the computations shall confirm these factors of safety occur at each module level.

The maximum applied equivalent uniform bearing pressure under each module width shall be clearly indicated on the shop drawings submitted and shall be less than the allowable bearing pressure of the soil shown on the contract plans. Footings or other treatments to satisfy the bearing pressure requirements will be designed by the wall supplier and included in the wall bid price.

The excavation bracing system shall be designed according to requirements specified in special provision for Braced Excavation (Special).

If the chamber supplier needs additional information to complete the design, the Contractor shall be responsible for obtaining the information at no additional cost to the Department.

Construction Requirements: Construction Requirements shall be according to sections 502, 503 and 504 of the Standards Specifications for Road and Bridge Construction.

During construction, the adjacent building structures shall be monitored for vibrations according to the special provision for Construction Vibration Monitoring.

The Contractor shall obtain technical assistance from the supplier during installation to demonstrate proper construction procedures and shall include any costs related to this technical assistance in the unit price bid for this item.

The precast structure must be delivered undamaged to the site in its original, unopened container and packaging. Once on site the product shall be stored in a clean, dry area, and out of direct sunlight.

The foundation soils for the structure shall be graded for a width equal to or exceeding the module width. Prior to chamber construction, the foundation shall be compacted with a smooth wheel vibratory roller. Any foundation soils found to be unsuitable shall be removed and replaced, as directed by the Engineer, and shall be paid for separately according to Section 202 of the Standard Specifications.

The modules may not be loaded or shipped to the project site until they have obtained a minimum compressive strength of 3500 psi (24 MPa) and no sooner than seven days after casting. Precast modules shall be lifted and supported at the pointed indicated on the shop plans. They shall be stored off the ground. Stacked modules shall be separated by battens across the full width of each bearing point as recommended by the supplier to prevent concrete to concrete contact.

Install the storage chamber modules plumb, on line, and top proper elevations as shown on the construction documents. The modules shall be placed on a reinforced concrete foundation slab as shown in the plans, with a maximum spacing of ¾ inch between adjacent modules. The Contractor shall seal the perimeter horizontal joint between modules and foundation slab as shown in the plans. The Contractor shall seal all exterior joints between adjacent modules with joint wrap in accordance with ASTM C 891. Contractor must prepare all other surfaces and install joint sealer and joint wrap as previously mentioned, respectively.

During backfilling operations the Contractor shall fill on both sides of chamber at the same time and to approximate same elevation. The Contractor shall prevent wedging action against the chamber and the excavation bracing system. The Contractor shall not disrupt or damage joint wrap from joints during backfilling operations.

The excavation bracing system shall be removed in conjunction with the backfilling operations.

Basis of Payment: All work related to construction of the UNDERGROUND STORAGE CHAMBER, except construction vibration monitoring, as specified herein and detailed in the plans, including but not limited to, excavation, excavation bracing system, bailing, draining and pumping of excavation, construction of foundation slab, installation of storage chamber and access manholes, constructing storm sewer connection, backfilling and removal of excavation bracing system will be paid for at the contract unit price per EACH for UNDERGROUND STORAGE CHAMBER. The vibration monitoring will be paid for separately as CONSTRUCTION VIBRATION MONITORING.

PROTECTING OR RESETTING SURVEY MARKERS

Description. This work shall consist of protecting or resetting existing survey markers and existing survey marker vaults at the locations shown on the plans and as described in section 105.09 and 107.20 of the standard specifications. Survey markers may consist of property corners, section corners, subsection corners, or existing permanent survey markers.

Construction Requirements
All the existing survey markers listed in the plans or discovered in the field shall be documented and cross-tied by an Illinois Professional Land Surveyor prior to the start of work. Existing survey marker vaults shall be adjusted so the cover is ¼" below the final pavement elevation.

Property Corners, Section Corners, and Subsection Corners. For those to be reset outside the paved surface, a 5/8 inch diameter by minimum 30 inch long reinforcement bar and a 1-7/8 inch minimum diameter cap shall be installed. The cap shall be a corrosion-resistant aluminum survey cap of a design compatible with the reinforcement bar for a solid, tight fit after installation. The cap shall be marked as appropriate and shall also display the license number of the Illinois Professional Land Surveyor.

For those to be reset within the paved surface, an aluminum tablet shall be placed according to highway standard 667101 using a type I permanent survey marker.

If required, a new monument record shall be prepared and filed in the appropriate county court house for all government corners in accordance with Illinois Statutes, Chapter 765 ILCS Section 220 “Land Survey Monuments Act” and a recorded copy sent to the District 6 Chief of Surveys.

Permanent Survey Markers. Permanent survey markers to be reset shall be in accordance with Section 667 of the Standard Specifications and as shown on Highway Standard 667101.

Basis of Payment. The work for protecting or resetting survey markers shall be paid for at the contract unit price per each for PROTECTING OR RESETTING SURVEY MARKERS, which price shall include hiring an Illinois Professional Land Surveyor, and providing the labor and equipment necessary to protect or reset survey markers and to adjust existing vaults.

The work for furnishing and installing permanent survey markers will be paid for according to Article 667.05 of the Standard Specifications.

PERMANENT SURVEY MARKERS (SPECIAL)

Description. This work shall consist of furnishing and installing permanent survey markers according to Section 667 of the Standard Specifications and as described herein.

Construction Requirements. This work shall be completed under the supervision of an Illinois Professional Land Surveyor. The cap shall be marked as appropriate and shall also display the license number of the Illinois Professional Land Surveyor.

The survey marker shall be Type II as shown on Highway Standard 667101.

Basis of Payment. This work shall be paid for at the contract unit price per each for PERMANENT SURVEY MARKERS (SPECIAL).

LIGHT POLE, ALUMINUM **11/13/13**

Description. This work shall consist of furnishing and installing an aluminum light pole according Section 830 of the Standard Specification and as described herein.

Materials. Materials shall be according to Article 830.02 of the Standard Specifications.

Installation. Installation shall be according to Article 830.03 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per each for LIGHT POLE, ALUMINUM, 20 FT. M.H., 4 FT. DAVIT ARM.

ORNAMENTAL LIGHT UNIT, COMPLETE

Description. This work shall consist of furnishing and installing an ornamental street lighting unit according to all applicable portions of Sections 821 and 830 of the Standard Specifications, as shown on the plans, and as described herein. This shall include the light pole, base, luminaire, and all appurtenances.

Materials. Materials shall be according to Articles 821.02 and 830.02, except as follows:

Luminaire:

The luminaire shall be Philips Lumec Serenade model number S56-150HPS-GL-DSX3-240-SFX, or approved equal. The housing and fitter shall be A360.1 high-strength cast aluminum with a black finish. The lamp shall be accessible without the use of tools. The luminaire shall accept a 4" O.D. tenon.

The optical assembly shall have an internal, segmented aluminum cutoff reflector and shall be fully sealed to exclude dirt and insects. The lens shall be a UV stabilized molded acrylic or glass globe. The lamp shall be 150W high pressure sodium, mogul base, according to Article 1067.06 of the Standard Specifications.

The ballast shall be 150W high pressure sodium with a high power factor of 90% or greater. The ballast shall be removable and replaceable without the use of tools.

Light Pole:

The light pole shall be Philips Lumec model RA61U, or approved equal, with a black finish. The pole height shall be as needed to provide a 16' luminaire mounting height. The pole shaft shall be high strength extruded aluminum and shall be round or tapered with a cast aluminum base. The top tenon shall have a 4" O.D.

Basis of Payment. This work will be paid for at the contract unit price each for ORNAMENTAL LIGHT UNIT, COMPLETE.

LIGHTING UNIT COMPLETE, SPECIAL

Description. This work shall consist of furnishing and installing an ornamental street lighting unit according to all applicable portions of Sections 821 and 830 of the Standard Specifications, as shown on the plans, and as described herein. This shall include the light pole, arm, base, luminaire, and all appurtenances.

Materials. Materials shall be according to Articles 821.02 and 830.02, except as follows:

Luminaire:

The luminaire shall be Philips Lumec Domus 55 model number DMS55-250HPS-SG2-240-SMB, or approved equal. The housing and hood shall be A360.1 high-strength cast aluminum with a black finish. The lamp shall be accessible without the use of tools. The luminaire adaptor shall accept a 2 3/8" O.D. tenon.

The optical assembly shall be fully sealed to exclude dirt and insects. The lens shall be tempered glass. The lamp shall be 250W high pressure sodium, mogul base, according to Article 1067.06 of the Standard Specifications.

The ballast shall be 250W high pressure sodium with a high power factor of 90% or greater. The ballast shall be removable and replaceable without the use of tools.

Light Pole:

The light pole shall be Philips Lumec model RAS61V, or approved equal, with a black finish. The pole height shall be as needed to provide a 23' luminaire mounting height. The pole shaft shall be high strength extruded aluminum and shall be round or tapered with a cast aluminum base. The pole top shall have a 5 9/16" O.D.

The arm and decorative scroll shall be similar in appearance to Philips Lumec model VR6-1A with a black finish. The pole adaptor shall slip-fit over a 5 9/16" O.D. pole or tenon.

Basis of Payment. This work will be paid for at the contract unit price each for LIGHTING UNIT COMPLETE, SPECIAL.

LUMINAIRE TESTING

Revise Article 1067.01(h) of the Standard Specifications to read:

Inspection and Testing: Each luminaire type, wattage, and distribution with a contract quantity of 30 or more shall be inspected and tested, unless noted otherwise. Testing is not required for temporary lighting luminaires. The Inspection and Testing process consists of random selection, physical inspection, photometric testing, electrical testing, and evaluation. Luminaire testing coordination shall be the Contractor's responsibility. The Contractor shall begin the inspection and testing process within 7 calendar days after shop drawing approval and shall ensure that the testing causes no delays to construction. All costs associated with luminaire testing shall be included in the bid price of the luminaire(s) to be tested. Failure to coordinate luminaire testing shall not be grounds for additional compensation or extension of time.

The Inspection and Testing process shall be performed by an Independent Witness and a laboratory properly accredited for each of the required tests. The qualifications of the Independent Witness and laboratory shall be submitted to the Electrical Unit in Springfield for approval prior to the start of the Luminaire Testing process. A laboratory independent of the luminaire manufacturer, distributor, and contractor shall self-certify the test results, and the Independent Witness does not need to be present during the testing. Otherwise the Independent Witness must be present during the testing and shall certify the test results.
Random Selection: The Independent Witness shall randomly select a quantity of sample luminaires from the entire completed lot of luminaires for each type, wattage, and distribution at the manufacturer's facility or the Contractor's storage facility. Selections from partial lots are not permitted. For each luminaire type requiring testing, one luminaire sample plus one additional sample for each additional luminaire quantity of 50 shall be tested. The Independent Witness shall mark each sample luminaire's shipping carton(s) with the IDOT Contract Number and a unique sample identifier.

Physical Inspection: At the time of random selection, the Independent Witness shall inspect the luminaire for compliance with this Special Provision. The physical inspection shall include, but is not limited to, the items in the Luminaire Physical Inspection Checklist. If deficiencies are found during the physical inspection, the Contractor shall have all luminaires of that type inspected for the identified deficiencies and shall correct the problem(s) where found. Random luminaire selection and physical inspection must then be repeated. When the physical inspection is successfully completed, the Independent Witness shall mark the project number and sample identifier on the interior housing and ballast of the luminaire.

Photometric Testing: All testing shall cover the full spherical light output at a maximum of 5 degree intervals on both the vertical planes and the cones. Tests that "mirror" results from one hemisphere or quadrant to another are not acceptable. The Independent Witness or the Independent Test Laboratory's authorized representative shall observe and verify the installation of the luminaire on the photometer and lamp stabilization prior to initiating measurements. The laboratory shall mark its test identification number on the interior of each sample luminaire.

The results for each photometric test performed shall be presented in a report that includes the IDOT contract number, sample identifier, and the outputs listed in Article 1067.01(g) of the Standard Specifications. The report shall also include complete photometric calculations based on specified requirements and test results. The calculated results for each sample luminaire shall meet or exceed the Contract Specified Levels in the Luminaire Performance Table.
Electrical Testing: The results of each electrical test performed shall be presented in a report that includes the IDOT contract number, sample identifier, and the following outputs: confirmation of correct wiring, ballast dielectric test, starter test, and lamp current crest factor test results, ballast losses in watts as a percent of input power, minimum power factor over the design range of nominal input voltage at nominal lamp voltage, lamp volt-watt traces at 90%, 100%, and 110% of nominal input voltage with ANSI Trapezoid shown, and a table of ballast characteristics showing input voltage, watts and power factor, output volts, amperes, watts and crest factor, as well as ballast losses over the range of values required to produce the lamp volts-watt traces.

Summary Test Report: The Summary Test Report shall consist of a narrative documenting the test process, highlight any deficiencies and corrective actions, and clearly state which luminaires have met or exceeded all test requirements and may be released for delivery to the job site. The Summary Test Report shall include appendices containing all Physical Inspection Checklists, Photometric and Electrical Test Reports, and Photometric Test Evaluations sorted by luminaire type, wattage, and distribution. All test reports shall be certified by the Independent Witness or the Independent Test Laboratory's authorized representative by a dated signature on the first page of each report. The Summary Test Report shall be delivered to the Electrical Unit in Springfield and the Contractor as a PDF file attached to an e-mail. Hard copy reports shall be delivered to the Engineer as an information-only submittal.

Should any of the tested luminaires fail to satisfy the specifications and perform according to approved submittal information, all luminaires of that type, wattage, or distribution are unacceptable and shall be replaced. Replacement luminaires must meet the specifications, and therefore the submittal and testing process for the unacceptable luminaire type(s), wattage(s) and distribution(s) must be repeated in its entirety.

The Contractor may request in writing permission from the Electrical Unit in Springfield that unacceptable luminaires be corrected in lieu of replacement. The request shall identify the corrections to be made. The request shall identify which re-tests, if any, the Contractor requests to be waived because of prior acceptable results. Upon approval of the request, the Contractor shall apply the correction to the entire lot of unacceptable luminaires. Once corrections are completed, the luminaire testing process shall be repeated, including selection of a new set of sample luminaires, less any re-tests the Electrical Unit agreed to waive. The same quantity of sample luminaires shall be retested as in the original testing. Luminaires which are not corrected shall not be re-tested.

The process of retesting corrected or replacement luminaires shall be repeated until luminaires for each type, wattage, and distribution are approved for the project. Corrections and re-testing shall not be grounds for additional compensation or extension of time.

This work shall not be measured or paid for separately, but shall be considered included in the cost of the lighting pay items.

Illinois Department of Transportation
Luminaire Physical Inspection Checklist

IDOT Contract No: _____ Date: _____ Inspector: _____
Luminaire Type: _____ Wattage: _____ Distribution: _____

Packaging:

Inspection Item	Sample:	Sample:	Sample:	Sample:
Shipping carton undamaged				
Shipping carton properly labeled				
Packaging adequately secures and protects luminaire				

Luminaire Housing

Inspection Item	Sample:	Sample:	Sample:	Sample:
Paint and coatings even and unblemished				
Lens not cracked or scratched				
No dents, cracks, or other malformations present				
Correct breather vent and filter present				
Wattage and distribution labels correct				
Pole or bracket mounting hardware correct				

Lamp Compartment

Inspection Item	Sample:	Sample:	Sample:	Sample:
Reflector secure, clean, and unblemished				
Lens properly secured to door or housing				
Lamp socket undamaged and secure				
Lamp socket in correct position (if multi-position)				
Lamp door gaskets correctly installed				
Lamp door latch operates correctly				
All fasteners are stainless steel				
Hardware used to access lamp compartment and remove lamp door and lamp is captive.				

Ballast Compartment

Inspection Item	Sample:	Sample:	Sample:	Sample:
Ballast is held securely in place				
Wiring is undamaged, protected from sharp edges, and neatly routed				
Terminations for incoming power wiring are clearly marked and correct for 10 AWG cables				
Ballast has quick-disconnect plugs for power and lamp connections which cannot be mis-connected				
Photocell socket is securely mounted and gasketed				
Barrier present between lamp and ballast compartments				
Ballast door gaskets are correctly installed				
Ballast door latch operates correctly				
All fasteners are stainless steel				
Hardware used to access ballast compartment and remove ballast door and ballast is captive.				

Describe any deficiencies found:

ILLINOIS DEPARTMENT OF TRANSPORTATION
100W CONVENTIONAL LUMINAIRE PERFORMANCE TABLE

GIVEN CONDITIONS

ROADWAY DATA:	**Pavement Width**	**18 FT**
	Number Of Lanes (In Direction of Travel)	**1**
	Median Width	**N/A**
	IES Surface Classification	**R3**
	Q-Zero Value	**.07**
LIGHT POLE DATA:	**Mounting Height**	**20 FT**
	Mast Arm Length	**4 FT**
	Pole Set-Back From Edge Of Pavement	**4 FT**
LUMINAIRE DATA:	**Lamp Type**	
	Lamp Lumens	**9500**
	IES Vertical Distribution	**M or S**
	IES Control Of Distribution	**FC**
	IES Lateral Distribution	**2 or 3**
	Total Light Loss Factor	**0.684**
LAYOUT DATA:	**Spacing**	**120 FT**
	Configuration	**One Side**
	Luminaire Overhang Over Edge Of Pavement Lane	**0 FT**

NOTE: Variations from the above specified IES distribution pattern may be requested and acceptance of variations will be subject to review by the Engineer based on how well the performance requirements are met.

PERFORMANCE REQUIREMENTS

NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

ILLUMINATION:	**Average Horizontal Illumination, (E_{Ave})**	**0.6 Fc**
	Uniformity Ratio, (E_{Ave}/E_{Min})	**10.0**
LUMINANCE:	**Average Luminance: (L_{Ave})**	
	Uniformity Ratios: (L_{Ave}/L_{Min})	
	(L_{Max}/L_{Min})	
	Maximum Veiling Luminance Ratio: (L_V/L_{Ave})	

ILLINOIS DEPARTMENT OF TRANSPORTATION
150W DECORATIVE LUMINAIRE PERFORMANCE TABLE

GIVEN CONDITIONS

ROADWAY DATA:	**Pavement Width**	**24 FT**
	Number Of Lanes (In Direction of Travel)	**2**
	Median Width	**N/A**
	IES Surface Classification	**R3**
	Q-Zero Value	**.07**
LIGHT POLE DATA:	**Mounting Height**	**16 FT**
	Mast Arm Length	**N/A**
	Pole Set-Back From Edge Of Pavement	**22 FT**
LUMINAIRE DATA:	**Lamp Type**	**HPS**
	Lamp Lumens	**16000**
	IES Vertical Distribution	**M or S**
	IES Control Of Distribution	**SC**
	IES Lateral Distribution	**2 or 3**
	Total Light Loss Factor	**0.684**
LAYOUT DATA:	**Spacing**	**105 FT**
	Configuration	**Staggered**
	Luminaire Overhang Over Edge Of Pavement Lane	**-22 FT**

NOTE: Variations from the above specified IES distribution pattern may be requested and acceptance of variations will be subject to review by the Engineer based on how well the performance requirements are met.

PERFORMANCE REQUIREMENTS

NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

ILLUMINATION:	**Average Horizontal Illumination, (E_{Ave})**	**0.4 Fc**
	Uniformity Ratio, (E_{Ave}/E_{Min})	**6.0**
LUMINANCE:	**Average Luminance: (L_{Ave})**	**0.3 Cd/m^2**
	Uniformity Ratios: (L_{Ave}/L_{Min})	**6.0**
	(L_{Max}/L_{Min})	**10.0**
	Maximum Veiling Luminance Ratio: (L_V/L_{Ave})	**0.40**

ILLINOIS DEPARTMENT OF TRANSPORTATION
250W CONVENTIONAL LUMINAIRE PERFORMANCE TABLE

GIVEN CONDITIONS

ROADWAY DATA:	**Pavement Width**	**24 FT**
	Number Of Lanes (In Direction of Travel)	**2**
	Median Width	**N/A**
	IES Surface Classification	**R3**
	Q-Zero Value	**.07**
LIGHT POLE DATA:	**Mounting Height**	**43 FT**
	Mast Arm Length	**10 FT**
	Pole Set-Back From Edge Of Pavement	**10 FT**
LUMINAIRE DATA:	**Lamp Type**	**HPS**
	Lamp Lumens	**28500**
	IES Vertical Distribution	**M**
	IES Control Of Distribution	**FC**
	IES Lateral Distribution	**2**
	Total Light Loss Factor	**0.684**
LAYOUT DATA:	**Spacing**	**360 FT**
	Configuration	**Staggered**
	Luminaire Overhang Over Edge Of Pavement Lane	**0 FT**

NOTE: Variations from the above specified IES distribution pattern may be requested and acceptance of variations will be subject to review by the Engineer based on how well the performance requirements are met.

PERFORMANCE REQUIREMENTS

NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

ILLUMINATION:	**Average Horizontal Illumination, (E_{Ave})**	**0.9 Fc**
	Uniformity Ratio, (E_{Ave}/E_{Min})	**3.0**
LUMINANCE:	**Average Luminance: (L_{Ave})**	**0.6 Cd/m^2**
	Uniformity Ratios: (L_{Ave}/L_{Min})	**3.5**
	(L_{Max}/L_{Min})	**6.0**
	Maximum Veiling Luminance Ratio: (L_V/L_{Ave})	**0.30**

ILLINOIS DEPARTMENT OF TRANSPORTATION
250W DECORATIVE LUMINAIRE PERFORMANCE TABLE

GIVEN CONDITIONS

ROADWAY DATA:	**Pavement Width**	**24 FT**
	Number Of Lanes (In Direction of Travel)	**2**
	Median Width	**N/A**
	IES Surface Classification	**R3**
	Q-Zero Value	**.07**
LIGHT POLE DATA:	**Mounting Height**	**23 FT**
	Mast Arm Length	**6 FT**
	Pole Set-Back From Edge Of Pavement	**22 FT**
LUMINAIRE DATA:	**Lamp Type**	**HPS**
	Lamp Lumens	**28500**
	IES Vertical Distribution	**M**
	IES Control Of Distribution	**C**
	IES Lateral Distribution	**2**
	Total Light Loss Factor	**0.684**
LAYOUT DATA:	**Spacing**	**160 FT**
	Configuration	**Staggered**
	Luminaire Overhang Over Edge Of Pavement Lane	**-16 FT**

NOTE: Variations from the above specified IES distribution pattern may be requested and acceptance of variations will be subject to review by the Engineer based on how well the performance requirements are met.

PERFORMANCE REQUIREMENTS

NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

ILLUMINATION:	**Average Horizontal Illumination, (E_{Ave})**	**0.8 Fc**
	Uniformity Ratio, (E_{Ave}/E_{Min})	**6.0**
LUMINANCE:	**Average Luminance: (L_{Ave})**	**0.6 Cd/m^2**
	Uniformity Ratios: (L_{Ave}/L_{Min})	**6.0**
	(L_{Max}/L_{Min})	**10.0**
	Maximum Veiling Luminance Ratio: (L_V/L_{Ave})	**0.40**

DIVISION 1 – PUMP STATION SCOPE OF WORK & GENERAL REQUIREMENTS
SECTION 011000 – SCOPE OF PUMP STATION WORK

1.1 PUMP STATION GENERAL WORK

A. The requirement of Section 012000, General Requirements, shall apply to all Pump Station General Work.

B. The Pump Station General Work shall include, but not be limited to, the following:

1. All unit masonry work consisting of concrete masonry unit (CMU) work and face brick work as indicated on the Drawings and as specified in Section 042000, Unit Masonry.
2. All metal work Including; beams, lintels, ladders, ladder rungs, railings, grating, and other structural steel items, as indicated on the Drawings and as specified in Sections 055000 Metal Fabrications, 055213 Pipe Railings, and 055313 Bar Gratings.
3. All interior and exterior floor hatch work as indicated on the drawings.
4. Cold formed metal roof framing as indicated on the drawings.
5. All carpentry work as indicated on the Drawings and as specified in Section 061000, Rough Carpentry.
6. Sheet membrane waterproofing as indicated on the drawings and specified in Section 0711326, Sheet membrane waterproofing.
7. All Standing Seam metal roofing work, as indicated on the Drawings and as specified in Section 076100, Sheet Metal Roofing.
8. All sheet metal flashing work as indicated on the Drawings and as specified in Section 076200, Sheet Metal Flashing and Trim.
9. All sealant work as indicated on the Drawings and as specified in Section 079200, Joint Sealants.
10. All Spray Foam Insulation work as indicated on the Drawings and as specified in Section 072100, Thermal Insulation.
11. All door frames, doors, and hardware as indicated on the Drawings and as specified in Sections 081113 Hollow Metal Doors and Frames, and 087100 Door Hardware.
12. All painting as indicated on the Drawings and as specified in Section 099113, Exterior painting and 099123, Interior painting.
13. The fire extinguishers, as indicated on the Drawings and as specified in Section 104461, Fire Extinguishers.
14. During the course of the construction work and until final acceptance, the Contractor shall maintain and ensure the operational integrity of the pump station.

C. All work described in Item 1.1 (B) above shall be included in a Contract lump sum price for PUMP STATION GENERAL WORK, which shall be payment in full for the work described herein unless otherwise noted. The excavation, concrete and reinforcing steel to construct the below-grade wet well and the ground floor slab is not included in Pump Station General Work, but will be paid for separately under Braced Excavation (Special), Concrete Structures, Seal Coat Concrete and Reinforcing Steel, (Epoxy Coated) pay items.

1.2 PUMP STATION MECHANICAL WORK

A. The requirements of Section 012000, General Requirements, shall apply to all Pump Station Mechanical Work described herein.

B. The Pump Station Mechanical Work shall include, but not be limited to, furnishing and installing the following items as indicated on the Drawings and in Division 15 Pump Station Mechanical Work:

1. Installation and connection of a new gas service including coordination with the utility company, and all required equipment and appurtenances for a complete and operational permanent natural gas service.
2. New submersible pumps installed complete and operational, including all appurtenances.
3. New pump discharge piping up to 5 feet outside the pumping station, pump base elbow, pump guide rails, anti-vortex devices, fittings, wall castings, duckbill valves and appurtenances.
4. New stilling well and float switches.
5. All required pipe and equipment support systems, hangers, and appurtenances; required for the installation of all piping, pumps, valves, and other mechanical items.
6. New metal trash rack, including appurtenant items.
7. New natural gas pressure regulator and piping to the generator.
8. Any miscellaneous mechanical items that are ancillary to the Work described above for a completely operational pumping station.
9. Testing and commissioning of pumps.
10. New ventilation system including, but not limited to, exhaust fans, supply fans, unit heaters, duct work, louvers, dampers, actuators, controls for all fans and unit heaters, control wiring and all associated appurtenances.
11. Testing, balancing and commissioning of HVAC equipment.
12. Operation and Maintenance Manuals.
13. Training

C. All work described in Item 1.2 (B) above shall be included in a Contract lump sum price for PUMP STATION MECHANICAL WORK, which shall be payment in full for the work described herein unless otherwise noted. All charges by the utility company to provide the gas service connection will be paid for separately under GAS UTILITY SERVICE CONNECTION.

1.3 PUMP STATION ELECTRICAL WORK

A. The requirements of Section 012000, General Requirements, shall apply to all Pump Station Electrical Work described herein.

B. The Pump Station Electrical Work shall include, but not be limited to, furnishing and installing the following items as indicated on the Drawings and in Division 16 Pump Station Electrical Work:

1. Installation and connection of a new electric service including coordination with the utility company, transformer pad, primary and secondary service conduits and cable between transformer and CT Cabinet, and all metering equipment, in accordance with the local utility company (Ameren) requirements.

2. New motor control center, including service main, generator main and automatic transfer switch and surge protective devices.
3. New natural gas engine generator.
4. Installation of local disconnect switches for all equipment including heating and ventilation equipment and thermostats.
5. New Control and Programmable Logic Controller (PLC) panel. The PLC will serve as the master controller for the station and will monitor/control the following equipment at a minimum:
    a. Motor Control Center
    b. Automatic Transfer Switch
    c. Pump motor starters and protective devices
    d. Level sensing systems, both float type and analog type.
    e. Combustible gas detection system
    f. Fire alarm system
6. New lighting fixtures, auxiliary panel board, auxiliary transformer and wiring devices.
7. New power, lighting, control and signal wires and cables.
8. Installation of Electric unit heaters
9. New conduit and raceway system.
10. Connections to float type level sensing control system.
11. New upstream and downstream submersible level sensing systems.
12. New combustible gas detection system, fire detection system and intrusion alarm system.
13. Branch wiring and conduit for main pumps, low flow pump, auxiliary transformer, auxiliary panel board, fire alarm system, combustible gas detection system, intrusion alarm system, unit heaters, ventilation system, Control and PLC panel and other electrical equipment shown on the Drawings.
14. Grounding and Lightning Protection
15. New Telephone Service
16. Testing and commissioning of Generator, ATS, MCC, Surge Protective Devices, Fire Alarm System, Combustible Gas Detection System and Intrusion Alarm System.
17. Operations and Maintenance Manuals for all systems.
18. Training

C. All work described in Item 1.3 (B) above shall be included in a Contract lump sum price for PUMP STATION ELECTRICAL WORK, which shall be payment in full for the work described herein unless otherwise noted. All charges by the utility company to provide the electric service connection will be paid for separately under ELECTRIC UTILITY SERVICE CONNECTION.

1.4 ELECTRIC UTILITY SERVICE CONNECTION

A. All charges by the electric utility company (Ameren) to provide the permanent electric service connection shall be paid to the utility company by the Contractor. The Contractor will be reimbursed the exact amount of these charges, plus any allowable administrative costs according to article 109.05 of the Standard Specifications.

B. For bidding purposes, ELECTRIC UTILITY SERVICE CONNECTION (Lump Sum) shall be estimated at $15,000.

1.5 GAS UTILITY SERVICE CONNECTION

A. All charges by the gas utility company (Ameren) to provide the permanent natural gas service connection shall be paid to the utility company by the Contractor. The Contractor will be reimbursed the exact amount of these charges, plus any allowable administrative costs according to article 109.05 of the Standard Specifications.

B. For bidding purposes, GAS UTILITY SERVICE CONNECTION (Lump Sum) shall be estimated at $5,000.

SECTION 012000 – PUMP STATION GENERAL REQUIREMENTS

1.1 SUBMITTALS

A. Except as specified elsewhere herein, materials and equipment shall be in conformance with the requirements of Section 106 of the Standard Specifications.

B. Materials and equipment shall be the products of established and reputable manufacturers and shall be suitable for the service required. Unless otherwise specifically indicated, all materials and equipment shall be new. The Contractor is obligated to conduct his own search into the timely availability of the specified equipment and materials to ensure that they are in strict conformance with the contract documents and that delivery schedules are compatible with project time constraints. Materials or equipment items which are similar or identical shall be the product of the same manufacturer. The cost of submittals, certifications, any required samples, and similar costs shall not be separately paid for but shall be included in the pay item bid price for the respective material or work.

C. All equipment, products, and materials incorporated in the work shall be submitted for approval.

D. Specific submittals required for individual elements of work are specified in the individual specification sections. Except as otherwise indicated in specification sections, requirements specified herein shall apply for each indicated type of submittal. Procedures concerning items such as a listing of manufacturers, suppliers, subcontractors, construction progress schedule, schedule of Shop Drawing submissions, bonds, payment applications, insurance certificates, and schedule of values are specified elsewhere.

E. WORK RELATED SUBMITTALS

1. Substitution or "Or Equal" Items include material or equipment Contractor requests Engineer to accept, after Bids are received, as substitute for items specified or described in Specifications by using name of a proprietary item or name of particular supplier.
2. Shop Drawings include technical data and drawings specially prepared for this Project, including fabrication and installation drawings, diagrams, actual performance curves, data sheets, schedules, templates, patterns, reports, instructions, design mix formulas, measurements, and similar information not in standard printed form. Standard information prepared without specific reference to the Project is not considered a Shop Drawing.

3. Product Data include standard printed information on manufactured products and systems that has not been specially prepared for this project, including manufacturer's product specifications and installation instructions, catalog cuts, standard wiring diagrams, printed performance curves, mill reports, and standard color charts.
4. Samples include both fabricated and manufactured physical examples of materials, products, and units of work, partial cuts of manufactured or fabricated work, swatches showing color, texture, and pattern, and units of work to be used for independent inspection and testing. Mock-ups are special forms of samples, which are too large or otherwise inconvenient for handling in manner specified for transmittal of sample submittals.
5. Miscellaneous Submittals are work-related submittals that do not fit in the previous categories, such as guarantees, warranties, certifications, experience records, maintenance agreements, Operating and Maintenance Manuals, workmanship bonds, survey data and reports, physical work records, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, and similar information, devices, and materials applicable to the Work.

F. SCHEDULING

1. A preliminary schedule of shop drawings and sample submittals shall be submitted for approval, in duplicate.
2. Prior to final payment, the original and one copy of all bonds, warranties, guarantees, and similar documents, including those customarily provided by manufacturers and suppliers which cover a period greater than the one year correction period shall be delivered to the Engineer.
3. Within 60 days of the contract award, the Contractor shall submit, for approval, complete manufacturer's product data (for standard products and components) and detailed shop drawings (for fabricated equipment). Submittals need not include all project equipment and materials in one submittal; however, the submittals for the equipment and materials for each individual pay item shall be complete in every respect. Partial submittals may be returned without review. The Contractor may request, in writing, permission to make a partial submittal; the Engineer will evaluate the circumstances of the request and may accept to review such partial submittal. However, no additional compensation or extension of time will be allowed for extra costs or delays incurred due to partial or late submittals.

G. Each submittal shall be accompanied by a transmittal containing the following information:

1. Contractor's Name
2. Supplier's Name
3. Manufacturer's Name
4. Date of submittal and dates of previous submittals containing the same material
5. Project Route/Name
6. Section
7. Submittal and transmittal number
8. Contract identification
9. Identification of equipment and material with equipment identification numbers, motor numbers, and specification section number
10. Variations from Contract Documents and any limitations which may impact the Work.
11. Drawing sheet and detail number as appropriate.

H. Exceptions, Deviations, and Substitutions

1. In general, 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. In general, substitutions must demonstrate that the proposed substitution is equal to or superior to the equipment or material required by the Contract Documents. No exceptions, deviations, or substitutions will be permitted without approval.
2. Data for items to be submitted for review, as substitution shall be collected into one submittal for each item of material or equipment.
3. Request shall be submitted with other scheduled submittals for the material or equipment allowing time for Engineer to evaluate the additional information required to be submitted. If Contractor requests to substitute for material or equipment specified but not identified in Specifications as requiring submittals, substitution submittal request shall be included in Submittal schedule and submitted as scheduled.

I. Shop Drawings

1. Shop drawing information shall be newly prepared and submitted with graphic information at accurate scale. The name of manufacturer or supplier (firm name) shall be indicated. Dimensions shall be shown and clearly noted which are based on field measurement; materials and products that are included in the Work shall be identified; revision shall be identified. Compliance with standards and notation of coordination requirements with other work shall be indicated. Variations from Contract Documents or previous submittals shall be highlighted, encircled or otherwise indicated.

2. The following information shall be included on each drawing or page:

   a. Submittal date and revision dates.
   b. Project name, division number and descriptions.
   c. Detailed specifications section number and page number. d. Identification of equipment, product or material.
   e. Name of Contractor and Subcontractor.
   f. Name of Supplier and Manufacturer.
   g. Relation to adjacent structure or material. h. Field dimensions, clearly identified.
   i. Standards or Industry Specification references.
   j. Identification of deviations from the Contract Documents.
   k. Contractor's stamp, initialed or signed, dated and certifying to review of submittal, certification of field measurements and compliance with Contract.
   l. Physical location and location relative to other connected or attached material at which the equipment or materials are to be installed.

3. An 8-inch by 3-inch blank space shall be provided for Contractor and Engineer stamps.
4. Three blue line or black line prints or two reverse sepia reproducible and 1 blue or black line print shall be submitted. One reproducible or one print will be returned.
5. Materials, products or systems shall not be installed until copy of applicable product data showing only approved information is in possession of installer. One set of product data (for each submittal) shall be maintained at Project site. Five additional copies shall be marked with the date of approval and forwarded to the Engineer for use in field and for OWNER'S records.

J. Product Data

1. Required product data shall be collected into a single submittal for each element of work or system. Where product data has been printed to include information on several similar products, some of which are not required for use on Project or are not included in submittal, copies shall be marked to clearly show such information is not applicable.
2. Where product data must be specially prepared for required products, materials or systems, because standard printed data are not suitable for use, data shall be submitted as a Shop Drawing and not as product data.
3. Submittal is for information and record, and to determine that products, materials, and systems comply with Contract Documents. Submittal shall be final when returned by Engineer marked "Approved".
4. Four submittal copies, in addition to the number the Contractor requires returned, including those required for RECORD DRAWINGS, shall be submitted to the Engineer.
5. Materials, products or systems shall not be installed until copy of applicable product data showing only approval information is in possession of installer. One set of product data (for each submittal) shall be maintained at Project site, available for reference by Engineer and others.

K. Samples

1. Where possible, samples shall be physically identical with proposed materials or products to be incorporated into the Work. Where variations in color, pattern or texture are inherent in material or product represented by sample, multiple units (not less than 3 units) shall be submitted showing approximate limits of variations.
2. A full set of optional samples shall be provided where Engineer's selection required. Samples shall be prepared to match Engineer's selection where so indicated.
3. Each sample shall include generic description, source or product name and manufacturer, limitations, and compliance with standards.
4. Samples for Engineer's visual review and final check of coordination of these characteristics with other related elements of work shall be of general generic kind, color, pattern, and texture.
5. At Contractor's option, and depending upon nature of anticipated response from Engineer, initial submittal of samples may be either preliminary or final submittal.

   A preliminary submittal, consisting of a single set of samples, is required where specifications indicate Engineer's selection of color, pattern, texture or similar characteristics from manufacturer's range of standard choices is necessary.

   Preliminary submittals will be reviewed and returned with Engineer's "Action" marking.

   Three sets of samples shall be submitted in final submittal, one set will be returned.
6. The returned final set of samples shall be maintained at Project site, in suitable condition and available for quality control comparisons throughout course of performing work.

   Returned samples intended or permitted to be incorporated in the Work are indicated in specification sections, and shall be in undamaged condition at time of use.

L. Mock-ups and similar samples specified in specification sections are recognized as special type of samples. Requirements for sample submittal shall be complied with to greatest extent possible. Transmittal forms shall be processed to provide record of activity.

M. Miscellaneous Submittals

1. Inspection and Test Reports

   a. Each inspection and test report shall be classified as either "Shop Drawings" or "product data", depending on whether report is specially prepared for Project or standard publication of workmanship control testing at point of production. Inspection and test reports shall be processed accordingly.

2. Guarantees, Warranties, Maintenance Agreements, and Workmanship Bonds

    a. Refer to Guarantees and Warranties articles of this section for general requirements, and specification sections of particular work item for specific requirements. Submittal is final when returned by Engineer marked "Approved" or "Approved as Noted".
    b. In addition to copies desired for Contractor's use, 2 executed copies shall be furnished. Two additional copies shall be provided where required for maintenance data.

3. Certifications

    a. Refer to specification sections for specific requirements on submittal of certifications. Seven copies shall be submitted. Certifications are submitted for review of conformance with specified requirements and information. Submittal shall be final when returned by Engineer marked "Approved".
    b. Where certifications are specified, the information submitted for approval shall incorporate certification information. When a certification can be made prior to manufacture, the certification shall be included with initial submittal information. When certification is possible only after manufacture, the initial submittal information shall include a statement of intent to furnish the certification after equipment approval and manufacture. Certifications involving inspections and/or tests shall be complete with all test data presented in a neat, descriptive format, with all test data, applicable dates, times, and persons responsible.

4. Tools
    a) Spare parts, extra and overrun stock, maintenance tools and devices, keys, and similar physical units shall be submitted.
    b) Special tools are considered to be those tools which, because of their limited use, are not normally available but which are necessary for maintenance of particular equipment.
    c) For each type of equipment provided under this CONTRACT, a complete set of all special tools shall be furnished including grease guns and other lubricating devices, which may be needed for the adjustment, operation, maintenance, and disassembly of such equipment. Tools shall be of high grade, smooth forged alloy tool steel. Grease guns shall be of the lever type.
    d) One or more neat and substantial steel wall cases or cabinets shall be furnished and erected with flat key locks and clips or hooks to hold each special tool in a convenient arrangement.

N. Contractor's Stamp

1. Prior to submittal, the Contractor shall review the submittal material and shall affix his stamp of approval, with comments as applicable, signed by a responsible representative, to each appropriate submittal item. In the case of Subcontractor's submittals, both the Sub-contractor and the General Contractor shall review and stamp the submittal. Submittals which are not approved or approved-as-noted by the Contractor shall not be submitted to the Engineer.

   The Contractor shall not give an approved-as-noted status to submittals having incompleteness or major corrective notations as this will only delay the ultimate approval process.
2. The receipt of submittal information from the Contractor will be construed as the Contractor's assurance that he has reviewed the submittal information and attests to the submittal's accuracy and conformance to the requirements of the contract documents. Submitted information shall be complete and in sufficient detail to demonstrate compliance with all requirement of the contract documents, including fitting in the space provided and meeting all salient features of the specifications.

O. Submittal information must be particularly detailed in every respect. Product data shall present information to demonstrate the complete nature of the product, including dimensions, wiring diagrams, operating information, and the like. Shop drawings shall be extremely detailed and shall include all appropriate dimensions, fabrication details, component bill of material, information relative to mounting, detailed wiring, finish, and the like. Wiring diagrams shall include both schematic and point-to point representations, complete with references to circuiting as indicated on the Contract Drawings as well as terminal points of component devices.

P. Unless required elsewhere, submittals shall be distributed to subcontractors, suppliers, governing authorities, and others as necessary for proper performance of work.

Q. Except for submittals for record and similar purposes, where action and return on submittals are required or requested, Engineer will review each submittal, mark with appropriate action, and return. Where submittal must be held for coordination, Engineer will also advise Contractor without delay. Engineer will stamp each submittal with uniform, self-explanatory action stamp, appropriately marked with submittal action.

R. Where submittals are marked "Approved", Work covered by submittal may proceed PROVIDED IT COMPLIES WITH CONTRACT DOCUMENTS. Acceptance of Work will depend upon that compliance.

S. When submittals are marked "Approved as Noted" or "Approved Subject to Corrections Marked", Work covered by submittal may proceed provided it complies with both Engineer's notations or corrections on submittal and with Contract Documents. Acceptance of Work will depend on that compliance. Re-submittal is not required.

T. When submittals are marked "Examined and Returned for Correction or Disapproved or Rejected“, Work covered by submittal shall not proceed. Work covered by submittal shall not be used at Project site or elsewhere where Work is in progress. The submittal shall be revised or a new submittal shall be prepared in accordance with Engineer's notations in accordance with Re-submittal Preparation procedures specified in this section. The submittal shall be resubmitted without delay and repeated if necessary to obtain different action marking.

U. Any need for more than one resubmission, or any other delay in Engineer's review of submittals, will not entitle Contractor to extension of the Contract Time.

V. Coordination

1. Preparation and processing of submittals shall be coordinated with performance of the work, other submittals and related activities such as substitution requests, testing, purchasing, fabrication, delivery, and similar activities that require sequential activity.
2. Submission of different units of interrelated work shall be coordinated so that one submittal will not be delayed by Engineer's need to review a related submittal. Engineer may withhold action on any submittal requiring coordination with other submittals until related submittals are forthcoming.

W. Unless otherwise indicated, guarantees as specified herein shall be included with the submittal information of all applicable equipment and materials. Incompleteness, inaccuracy, or lack of coordination shall be grounds for rejection. The Contractor shall clearly understand no equipment or material shall be installed prior to approval and that any equipment or material installed prior to approval is subject to removal from the right-of-way solely at the Contractor's expense.

X. Re-submittal Preparation

1. Re-submittal preparation shall comply with the requirements described in subsection 1.6, Submittal, of this section. In addition, it shall be identified on the transmittal form that the submittal is a resubmission.
2. Any corrections or changes in submittals required by Engineer's notations shall be made on returned submittal.
3. On the transmittal or on a separate page attached to Contractor's resubmission transmittal, all notations or questions indicated by Engineer on Engineer's transmittal form shall be answered or acknowledged in writing. Each response shall be identified by question or notation number established by Engineer. If Contractor does not respond to each notation or question, resubmission will be returned without action by Engineer until Contractor provides a written response to all Engineer's notations or questions.

Y. Variations or revisions from previously reviewed submittal, other than those called for by Engineer, shall be identified on transmittal form.

1.2 GUARANTEES AND WARRANTIES

A. All equipment shall be furnished complete with the manufacturer's standard trade guarantee or warranty, applicable to the Illinois Department of Transportation, from the date of final acceptance. Such guarantee shall accompany submittal shop drawings and product data.
B. All equipment manufacturers shall provide a 12-month guarantee from the date of final acceptance that a resource will be made available for the village operating personnel to reach out to for troubleshooting and/or repair.

C. Prior to final payment, the original and one copy of all bonds, warranties, guarantees, and similar documents, including those customarily provided by manufacturers and suppliers which cover a period greater than the one year correction period shall be delivered to the Owner.

1.3 OPERATION AND MAINTENANCE MANUALS

A. Four copies of an Operation and Maintenance Manual shall be furnished to the Engineer for all equipment and associated control systems furnished and installed.

B. Prior to the Work Reaching 50 Percent Completion, one copy of the manual shall be submitted to the Engineer for approval with all specified material. The approval copies shall be submitted with the partial payment request for the specified completion. Within 30 days after the Engineer's approval of the submittal, the remaining 3 copies of the manual shall be furnished to the Engineer. Space shall be provided in the manual for additional material. Any missing material for the manual shall be submitted prior to requesting certification of substantial completion.

C. The manuals shall be organized and divided into volumes by systems and sub-systems as follows:

Volume 1 – Pumping Systems
Volume 2 – Motor Control Center and Surge Protective Devices
Volume 3 – All other electrical systems, including lighting
Volume 4 – Standby generator
Volume 5 – Heating, Ventilation and other Mechanical Systems
Volume 6 – Architectural and other building systems

Each volume shall include complete table of contents, so that reader will know exactly what is contained in each volume.

D. Each copy of the manual shall consist of the following and shall be prepared and arranged as follows:

1. A section of an equipment data summary (see sample form at end of section) for each item of equipment.
2. A section of an equipment preventive maintenance data summary (see sample form at end of section) for each item of equipment.
3. A section of the equipment manufacturer's operating and maintenance instructions. Operating instructions include equipment start-up, normal operation, shutdown, emergency operation and troubleshooting. Maintenance instructions include equipment installation, calibration and adjustment, preventive and repair maintenance, lubrication, troubleshooting, parts list and recommended spare parts.
4. List of electrical relay settings and control and alarm contact settings.
5. Electrical interconnection wiring diagram for equipment furnished including all control and lighting systems.
6. One valve schedule giving valve number, location, fluid, and fluid destination for each valve installed. All valves in same piping systems shall be grouped together in the schedule. A sample of the valve numbering system shall be obtained from the Engineer.

7. All O&M Manual material shall be on 8-1/2 inch by 11 inch commercially printed or typed forms or an acceptable alternative format.

E. Each manual shall be organized into sections paralleling the equipment specifications. Each section shall be identified using heavy section dividers with reinforced holes and numbered plastic index tabs. The data shall be compiled in high-quality heavy-weight, hard cover binders with piano style metal hinges or in an alternate approved format. Large drawings and other materials which would be opened or removed for reading shall be provided with heavy clear plastic pouches within the binders. The number of binders shall be as required to hold all required material without over-filling. Various sections, as appropriate shall have suitable dividers. All volumes shall be labeled. All loose data shall be punched for binding. Composition and printing shall be arranged so that punching does not obliterate any data. The project title, and manual title, as furnished and approved by the Engineer shall be printed on the cover and binding edge of each manual.

F. All operating and maintenance material that comes bound by the equipment manufacturer shall be left in its original bound state. The appropriate sections of the Contractor's O&M manual shall be cross-referenced to the manufacturers' bound manuals.

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

STORMWATER PUMP STATION NO. PS-01

Operation and Maintenance Manual

Equipment Data
Summary

Equipment Name: Specification

Reference: Manufacturer

Name:

Address:

Telephon

e:

Number Supplied:

Location/Servic

e: Model No: Serial No:

Type:

Size/Speed/Capacity/Range (as

applicable): Power Requirement

(Phase/Volts/Hertz): Local Representative

Name:

Address:

Telephon

e:

NOTES:

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

STORMWATER PUMP STATION NO. PS-01

Operation and Maintenance Manual

Preventive Maintenance Summary

Equipment Name: Location: O&M Manual Reference

Manufacturer:

Name:

Address:

Telephon

e:

Model No: Serial No:

Maintenance Task Lubricant/Part D W M Q SA

A NOTES:

*D-Daily, W-Weekly, M-Monthly, Q-Quarterly, SA-Semi-annual, A-Annual

1.4 RECORD DRAWINGS

A. One record copy of all Contract Documents, reference documents and all technical documents submitted in good order shall be kept and maintained at the site. On bond media, and using drafting symbols and standards consistent with the original documents, Contract Drawings shall be annotated in red to show all changes made during the construction period. Annotated drawings are to be made available to Engineer for reference at all times.

B. At completion of the CONTRACT and before final payment is made, three (3) sets of clearly legible 11”x17” bond media Contract Drawings reflecting all changes made during construction shall be delivered to the Engineer. The drawings shall each be stamped "RECORD DRAWING", and shall be marked with the contractor's stamp, the date, and the signature of the contractor's representative. In addition, one (1) CD containing electronic version of these documents in PDF format shall be provided. Refer to individual sections for addition requirements.

C. The Record Drawings must be submitted and must be acceptable to the Engineer prior to final acceptance.

DIVISIONS 4 THROUGH 10 - PUMP STATION GENERAL WORK
SECTION 042000 – UNIT MASONRY

GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including Section 012000 General Requirements, apply to this Section.

SUMMARY

A. This Section includes unit masonry assemblies consisting of the following:

Concrete masonry units (CMUs).
Face brick.
Mortar and grout.
Reinforcing steel.
Masonry joint reinforcement.
Ties and anchors.
Embedded flashing.
Miscellaneous masonry accessories.
Cavity-wall insulation.

Related Sections include the following:
Section 079200 "Joint Sealants" for sealing control and expansion joints in unit masonry.
Section 081113 “Hollow Metal Doors and Frames” for Door frames set in unit masonry walls.
3. Section 055000 “Metal Fabrications” for steel lintels and shelf angles for unit masonry.

DEFINITIONS

A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For the following:
Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls.

Samples for Verification: For each type and color of the following:

Face brick, in the form of straps of five or more bricks.

Exposed concrete masonry units.

Pigmented mortar. Make Samples using same sand and mortar ingredients to be used on Project**.** Label Samples to indicate types and amounts of pigments used.

Weep holes/vents.

Accessories embedded in masonry.

Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:

Masonry units.

Include material test reports substantiating compliance with requirements.

For bricks, include size-variation data verifying that actual range of sizes falls within specified tolerances.

For exposed brick, include material test report for efflorescence according to ASTM C 67.

Cementitious materials. Include brand, type, and name of manufacturer.

Preblended, dry mortar mixes. Include description of type and proportions of ingredients.

Reinforcing bars.

Joint reinforcement.

Anchors, ties, and metal accessories.

Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

Include test reports, per ASTM C 780, for mortar mixes required to comply with property specification.

Include test reports, per ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements.

QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1093 for testing indicated, as documented according to ASTM E 548.

B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.

Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer for each aggregate.

Preconstruction Testing: Contractor must provide standard test data required by referenced unit masonry standard or indicated herein for source and filed quality control.

Clay Masonry Unity Test: For each type of unity required, per ASTM C 67
Concrete Masonry Unity Test: For each type of unity required, per ASTM C 140.
Mortar Test (Property Specification): For each mix required, per ASTM C 780.
Grout Test (Compressive Strength): For each mix required, per ASTM C 1019.

Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
Where 1 wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
Protect sills, ledges, and projections from mortar droppings.
Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PRODUCTS

MASONRY UNITS, GENERAL

Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not uses units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

CONCRETE MASONRY UNITS (CMUs)

A. Shapes: Provide shapes indicated and as follows:

Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
Provide square-edged units for exterior outside corners, unless otherwise indicated.
Provide bullnose units for interior outside corners where indicated on the drawings.

Concrete Masonry Units: ASTM C 90.

Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi (13.1 MPa)
Weight Classification: Lightweight
Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.

MASONRY LINTELS

A. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam concrete masonry units with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

BRICK

A. General: Provide shapes indicated and as follows:

1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.

Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.

Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.

Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

B. Face Brick: ASTM C 216, Grade SW, Type FBX.

Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 3000 psi (20.7 MPa)

Initial Rate of Absorption: Less than 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67.

Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."

Size (Actual Dimensions): 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.

Products:

Endicott Clay Products Dark Ironspot Smooth Modular

MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207 Type S.

Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207, Type S.

Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.

Products:

Bayer Corporation, Industrial Chemicals Div.; Bayferrox Iron Oxide Pigments.
Davis Colors; True Tone Mortar Colors.
Solomon Grind-Chem Services, Inc.; SGS Mortar Colors.

Aggregate for Mortar: ASTM C 144.

For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.

Aggregate for Grout: ASTM C 404.

Water: Potable.

REINFORCEMENT

A. Steel Reinforcing Bars: Epoxy coated steel reinforcing bars complying with ASTM A775, Grade 60.

B. Steel Dowel Bars (for partial embedment in concrete): Epoxy coated steel reinforcing bars complying with ASTM A775, Grade 60.

Masonry Joint Reinforcement, General: ASTM A 951.

Interior Walls: Hot-dip galvanized, carbon steel.
Exterior Walls: Hot-dip galvanized, carbon steel.
Wire Size for Side Rods: W1.7 or 0.148-inch (3.8-mm) diameter.
Wire Size for Cross Rods: W1.7 or 0.148-inch (3.8-mm) diameter.
Wire Size for Veneer Ties: W1.7 or 0.148-inch (3.8-mm) diameter.
Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches (407 mm) o.c.
Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.

Masonry Joint Reinforcement for Single-Wythe Masonry: Either ladder or truss type with single pair of side rods.

Masonry Joint Reinforcement for Multiwythe Masonry:

Ladder type with 1 side rod at each face shell of hollow masonry units more than 4 inches (100 mm) in width, plus 1 side rod at each wythe of masonry 4 inches (100 mm) or less in width.

TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in subsequent paragraphs that are made from materials that comply with the subparagraphs below, unless otherwise indicated.

1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82; with ASTM A 153/A 153M, Class B-2 coating.

Stainless-Steel Wire: ASTM A 580/A 580M, Type 304.
Galvanized Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 (Z180) zinc coating.
Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, hot-dip galvanized after fabrication to comply with ASTM A 153/A 153M.
Stainless-Steel Sheet: ASTM A 666, Type 304.

B. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch (16-mm) cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches (50 mm) parallel to face of veneer.

Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches (100 mm) wide.

Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches (50 mm) long may be used for masonry constructed from solid units or hollow units laid with cells horizontal.
Where wythes are of different materials, use adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches (32 mm).
Wire: Fabricate from 3/16-inch- (4.8-mm-) diameter, hot-dip galvanized steel wire.

Adjustable Anchors for Connecting to Structure: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- (6.4-mm-) diameter, hot-dip galvanized steel wire.
Tie Section for Steel Frame: Triangular-shaped wire tie, sized to extend within 1 inch (25 mm) of masonry face, made from 0.188-inch- (4.8-mm-) diameter, hot-dip galvanized steel wire.

Partition Top anchors: 0.097-inch- (2.5-mm-) thick metal plate with 3/8-inch- (10-mm-) diameter metal rod 6 inches (150 mm) long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.

MISCELLANEOUS ANCHORS

A. Anchor Bolts: L-shaped steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.

EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual and as follows:

Stainless Steel: ASTM A 240/A 240M, Type 304, 0.016 inch thick.

Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet. Provide splice plates at joints of formed, smooth metal flashing.

Metal Drop Edges: Fabricate from Stainless steel. Extend at least 3 inches (75mm) into wall and ½ inch (13mm) out from wall, with outer edge bent down 30 degrees and hemmed.

B. Solder and Sealants for Sheet Metal Flashings: As specified in Division 07 Section "Sheet Metal Flashing and Trim."

Adhesives, Primers and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

Flexible Flashing: For flashing note exposed to the exterior, use the following, unless otherwise indicated:

Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to product an overall thickness of not less than 0.040 inch (1.0 mm).

Products:

Grace Construction Products, a unit of W.R. Grace & Co. – Comm.,: Perm-A-Barrier Wall Flashing

Or equal

MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

Weep/Vent Products: Use the following, unless otherwise indicated:

Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe, in color selected from manufacturer's standard.

Products:

Advanced Building Products Inc.; Mortar Maze weep vent.
Dayton Superior Corporation, Dur-O-Wal Division; Cell Vents.
Heckmann Building Products Inc.; No. 85 Cell Vent.
Hohmann & Barnard, Inc.; Quadro-Vent.
Wire-Bond; Cell Vent.

Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

Provide one of the following configurations:

Strips, full-depth of cavity and 10 inches (250 mm) wide, with dovetail shaped notches 7 inches (175 mm) deep that prevent mesh from being clogged with mortar droppings.

Products:

Mortar Net USA, Ltd.; Mortar Net.
Or equal.

Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed from 0.142-inch (3.6-mm) steel wire, hot-dip galvanized after fabrication. Provide units with either two loops or four loops as needed for number of bars indicated.

Products:

Dayton Superior Corporation, Dur-O-Wal Division; D/A 810, D/A 812 or D/A 817.
Heckmann Building Products Inc.; No. 376 Rebar Positioner.
Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
Wire-Bond; O-Ring or Double O-Ring Rebar Positioner.

CAVITY-WALL INSULATION

A. Polyisocyanurate Board Insulation: ASTM C 1289, Type I (aluminum-foil-faced), Class 2 (glass-fiber-reinforced).

B. Adhesive: Type recommended by insulation board manufacturer for application indicated.

MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

Manufacturers:

Diedrich Technologies, Inc.
EaCo Chem, Inc.
ProSoCo, Inc.

MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.

Limit cementitious materials in mortar to portland cement and lime.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

Mortar for Unit Masonry: Comply with ASTM C 270 Property Specification. Provide the following types of mortar for applications stated unless another type is indicated.

For masonry below grade or in contact with earth, use Type S.
For reinforced masonry, use Type S.
For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.
For interior non-load-bearing partitions, Type O may be used instead of Type N.

Grout for Unit Masonry: Comply with ASTM C 476.

Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602for dimensions of grout spaces and pour height.
Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143/C 143M.

EXECUTION

EXAMINATION

Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

Verify that foundations are within tolerances specified.
Verify that reinforcing dowels are properly placed.

Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

Proceed with installation only after unsatisfactory conditions have been corrected.

Proceed with installation only after the mockup has been accepted in writing by the Commission Representative.

INSTALLATION, GENERAL

A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

Build chases and recesses to accommodate items specified in this and other Sections.

Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.

Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

Mix units from several pallets or cubes as they are placed.

Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

Comply with construction tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:

For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m).
For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m) maximum.
For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m) maximum.
For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm). Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).
For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.
For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in Running bond; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches (50 mm). Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

Fill space between steel frames and masonry solidly with mortar, unless otherwise indicated.

Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.

Install compressible filler in joint between top of partition and underside of structure above.

Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch (13-mm) clearance between end of anchor rod and end of tube. Space anchors 48 inches (1200 mm) o.c., unless otherwise indicated.

At fire-rated partitions, treat joint between top of partition and underside of structure above as required to maintain partition rating.

MORTAR BEDDING AND JOINTING

A. Lay hollow concrete masonry units as follows:

1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.

With webs fully bedded in mortar in all courses of piers, columns, and pilasters.

With webs fully bedded in mortar in grouted masonry, including starting course on footings.

With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

CAVITY WALLS

A. Bond wythes of cavity walls together using one of the following methods:

Masonry Joint Reinforcement: Installed in horizontal mortar joints.

Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.
Where one wythe is of clay masonry and the other of concrete masonry, use adjustable (two-piece) type reinforcement to allow for differential movement regardless of whether bed joints align.

B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

Coat cavity face of backup wythe to comply with Section 071113 "Bituminous Dampproofing."

Installing Cavity-Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches (300 mm) o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

MASONRY JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).

1. Space reinforcement not more than 16 inches (406 mm) o.c.

Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings.

Reinforcement above is in addition to continuous reinforcement.

B. Interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

Provide continuity at wall intersections by using prefabricated T-shaped units.

Provide continuity at corners by using prefabricated L-shaped units.

ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:

Embed tie sections in masonry joints. Provide not less than 2 inches (50 mm) of air space between back of masonry veneer and face of masonry back up.
Locate anchor sections to allow maximum vertical differential movement of ties up and down.
Space anchors as indicated, but not more than 18 inches (458 mm) o.c. vertically and 24 inches (610 mm) o.c. horizontally, with not less than 1 anchor for each 2 sq. ft. (0.2 sq. m) of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 8 inches (203 mm), around perimeter.

CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry as follows:

Fit bond-breaker strips into hollow contour in ends of concrete masonry units on one side of control joint. Fill resultant core with grout and rake out joints in exposed faces for application of sealant.

Form expansion joints in brick made from clay or shale as follows:

Build flanges of metal expansion strips into masonry. Lap each joint 4 inches (100 mm) in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
Build flanges of factory-fabricated, expansion-joint units into masonry.
Build in compressible joint fillers where indicated.
Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch (10 mm) for installation of sealant and backer rod specified in Division 07 Section "Joint Sealants."

LINTELS

A. Install steel lintels where indicated.

B. Provide masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.

Provide minimum bearing of 8 inches (200 mm) at each jamb, unless otherwise indicated on structural drawings.

FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.

B. Install flashing as follows, unless otherwise indicated:

Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.

At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 8 inches (200 mm), and through inner wythe to within 1/2 inch (13 mm) of the interior face of wall in exposed masonry. Where interior face of wall is to receive furring or framing, carry flashing completely through inner wythe and turn flashing up approximately 2 inches (50 mm) on interior face.

At lintels and shelf angles, extend flashing a minimum of 6 inches (150 mm) into masonry at each end. At heads and sills, extend flashing 6 inches (150 mm) at ends and turn up not less than 2 inches (50 mm) to form end dams.

Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing ½ inch (13mm) back from outside face of wall and adhere flexible flashing to tope of stainless steel drip edge.

Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:

Use specified weep/vent products to form weep holes.
Space weep holes 24 inches (600 mm) o.c., unless otherwise indicated.

Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in Part 2 "Miscellaneous Masonry Accessories" Article.

REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.

Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

Limit height of vertical grout pours to not more than 60 inches (1520 mm).

FIELD QUALITY CONTROL

A. Testing Frequency: One set of tests for each 5000 sq. ft. (465 sq. m) of wall area or portion thereof.

B. Concrete Masonry Unit Test: For each type of unit provided, per ASTM C 140.

Mortar Test (Property Specification): For each mix provided, per ASTM C 780. Test mortar for compressive strength.

Grout Test (Compressive Strength): For each mix provided, per ASTM C 1019.

REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.
Clean stone trim to comply with stone supplier's written instructions.
Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

END OF SECTION 042000

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Section 012000 General Requirements, apply to this Section.

SUMMARY

A. This Section includes the following:
   Structural steel beams
   Steel framing and supports for mechanical and electrical equipment.
   Steel framing and supports for applications where framing and supports are not specified in other Sections.
   Shelf angles.
   Loose bearing and leveling plates.
   Miscellaneous steel trim including steel angle corner guards and steel edgings
   Metal ladders.
   Ladder Rungs.
   Floor Hatches.

Products furnished under this Section include the following:

   Loose steel lintels.
   Anchor bolts, steel pipe sleeves, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

Related Sections include the following:

   Section of IDOT Standard Specifications for installing anchor bolts, steel pipe sleeves, and other items indicated to be cast into concrete.
   Section 055213 "Pipe and Tube Railings."
   Section 055300 "Metal Gratings."

PERFORMANCE REQUIREMENTS

A. Thermal Movements: Provide exterior metal fabrications that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

SUBMITTALS

A. Product Data: For the following:
   1. Paint products.
   Floor Hatches
   Ladders

B. Shop Drawings: Show fabrication and installation details for metal fabrications.

   Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
   Provide templates for anchors and bolts specified for installation under other Sections.
   For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

Welding certificates.

Qualification Data: For installer.

QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to the following:

   AWS D1.1, "Structural Welding Code--Steel."

PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on Shop Drawings.

   1. Provide allowance for trimming and fitting at site.

COORDINATION

A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36.

Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304.

Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

Steel Tubing: ASTM A 500, cold-formed steel tubing.

Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

Cast Iron: ASTM A 48/A 48M, Class 30, unless another class is indicated or required by structural loads.

FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade, and class required.

B. Steel Bolts and Nuts: Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers.

Anchor Bolts: ASTM F 1554, Grade 36.

Provide hot-dip or mechanically deposited, zinc-coated anchor bolts where item being fastened is indicated to be galvanized.

Eyebolts: ASTM A 489.

Machine Screws: ASME B18.6.3.

Lag Bolts: ASME B18.2.1.

Plain Washers: Round, ASME B18.22.1.

Lock Washers: Helical, spring type, ASME B18.21.1.

Cast-in-Place Anchors in Concrete: Anchors capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.

Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.

Material for Anchors in Exterior Locations: Alloy Group 1 stainless-steel bolts complying with ASTM F 593 and nuts complying with ASTM F 594.

MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.

Use primer with a VOC content of 420 g/L (3.5 lb/gal. or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

Available Products:

Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
Carboline Company; Carbozinc 621.
ICI Devoe Coatings; Catha-Coat 313.
International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer.
PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.
Tnemec Company, Inc.; Tneme-Zinc 90-97.

Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

Form exposed work true to line and level with accurate angles and surfaces and straight edges.

Weld corners and seams continuously to comply with the following:

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
Obtain fusion without undercut or overlap.
Remove welding flux immediately.
At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.

Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches , with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.

Fabricate units from slotted channel framing where indicated.
Furnish inserts if units are installed after concrete is placed.

Galvanize miscellaneous framing and supports where indicated.

Prime miscellaneous framing and supports with zinc-rich primer.

LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Galvanize plates after fabrication.

STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with not less than two integrally welded steel stud anchors for embedding in concrete.

MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

Prime exterior miscellaneous steel trim and interior miscellaneous steel trim, where indicated with zinc-rich primer.

METAL LADDERS

A. General:

Comply with ANSI A14.3, unless otherwise indicated.
Space siderails 24 inches apart, unless otherwise indicated.
Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted brackets, made from same metal as ladder.

B. Steel Ladders:

Siderails: Continuous, 1/2-by-2-1/2-inch steel flat bars, with eased edges.
Rungs: 1-inch-diameter steel bars spaced at 12 inches on center.
Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
Provide nonslip surfaces on top of each rung by coating with abrasive material metallically bonded to rung by a proprietary process.
Available Products:

IKG Industries, a Harsco company; Mebac.
W. S. Molnar Company; SlipNOT.

Galvanize ladders, including brackets and fasteners.

FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

ASTM A 123/A 123M, for galvanizing steel and iron products.
ASTM A 153/A 153M, for galvanizing steel and iron hardware.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

Exteriors (SSPC Zone 1B) and Items Indicated to Receive Zinc-Rich Prime]: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."

Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

Stripe paint corners, crevices, bolts, welds, and sharp edges.

EXECUTION

3.1 INSTALLATION, GENERAL

Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

Field Welding: Comply with the following requirements:

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
Obtain fusion without undercut or overlap.
Remove welding flux immediately.
At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors.

Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports for operable partitions securely to and rigidly brace from building structure.

Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.

Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.

ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in painting sections.

Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000

SECTION 055213 - PIPE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Section 012000 General Requirements, apply to this Section.

SUMMARY

A. This Section includes the following:

Steel Pipe Railings.

PERFORMANCE REQUIREMENTS

A. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

1. Steel: 72 percent of minimum yield strength.

Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

Handrails:

Uniform load of 50 lbf/ ft. applied in any direction.
Concentrated load of 200 lbf applied in any direction.
Uniform and concentrated loads need not be assumed to act concurrently.

Top Rails of Guards:

Uniform load of 50 lbf/ ft. applied in any direction
Concentrated load of 200 lbf applied in any direction.
Uniform and concentrated loads need not be assumed to act concurrently.

Infill of Guards:

Concentrated load of 200 lbf applied horizontally on an area of 1 sq. ft.
Infill load and other loads need not be assumed to act concurrently.

Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

SUBMITTALS

A. Product Data: For the following:

Anchoring, and galvanizing repair paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

Welding certificates.

Qualification Data: For testing agency.

QUALITY ASSURANCE

A. Source Limitations: Obtain each type of railing through one source from a single manufacturer.

B. Welding: Qualify procedures and personnel according to the following:

AWS D1.1, "Structural Welding Code--Steel."

PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Provide allowance for trimming and fitting at site.

COORDINATION AND SCHEDULING

A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

B. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

Steel Pipe and Tube Railings:

Pisor Industries, Inc.
Sharpe Products.
Wagner, R & B, Inc.; a division of the Wagner Companies.

METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

STEEL AND IRON

A. Tubing: ASTM A 500 (cold formed) or ASTM A 513, Type 5 (mandrel drawn).

B. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

Provide galvanized finish for all installations.

Plates, Shapes, and Bars: ASTM A 36/A 36M.

FASTENERS

A. General: Provide the following:

Steel Railings: Plated steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.

B. Anchors: Provide galvanized steel sleeves, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed as indicated on the drawings, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage**,** but not less than that required to support structural loads.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

Form work true to line and level with accurate angles and surfaces.

Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

Connections: Fabricate railings with welded connections, unless otherwise indicated.

Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
Obtain fusion without undercut or overlap.
Remove flux immediately.
At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

Form changes in direction as follows:

As detailed.
By bending.

Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

Close exposed ends of railing members with prefabricated end fittings.

For removable railing posts, fabricate slip-fit sockets from steel tube or pipe whose ID is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than one-fortieth of post height. Provide socket covers designed and fabricated to resist being dislodged.

Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.

Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

STEEL AND IRON FINISHES

A. Galvanized Railings:

Hot-dip galvanize steel and iron railings, including hardware, after fabrication.

B. Fill vent and drain holes that will be exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

EXECUTION

3.1 INSTALLATION, GENERAL

Fit exposed connections together to form tight, hairline joints.

Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
Set posts plumb within a tolerance of 1/16 inch in 3 feet.
Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

Adjust railings before anchoring to ensure matching alignment at abutting joints.

Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in Part 2 "Fabrication" Article whether welding is performed in the shop or in the field.

ANCHORING POSTS

A. Install removable railing sections in slip-fit metal sleeves welded to steel beams or plates.

ADJUSTING AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 055213

SECTION 055313 - BAR GRATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including Section 012000 General Requirements, apply to this Section.

SUMMARY

A. Section includes metal bar gratings and metal frames and supports for gratings.

ACTION SUBMITTALS

A. Product Data: For the following:

Clips and anchorage devices for gratings.

Shop Drawings: Include plans, sections, details, and attachments to other work.

Delegated-Design Submittal: For gratings, including manufacturers' published load tables and analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
Amico Grating, Inc.
McNichols Company.
IKG Industries; a Harsco Company
Alabama Metal Industries Corporation
Fisher & Ludlow
GS Metal Corporation
Morton Manufacturing Company

PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, to design gratings.

Structural Performance: Gratings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

Floors: Uniform load of 250 lbs/sq. ft. or a concentrated load of 3000 lbs/ft. width. Limit deflection to L/240 or 1/4 inch, whichever is less.

METAL BAR GRATINGS

A. Metal Bar Grating Standards: Comply with NAAMM MBG 532, "Heavy-Duty Metal Bar Grating Manual."

B. Welded Steel Grating :

Bearing Bar Spacing: 1-3/16 inches o.c.
Bearing Bar Depth: As required to comply with structural performance requirements; 2 inch minimum.
Bearing Bar Thickness: As required to comply with structural performance requirements; 1/4 inch minimum.
Crossbar Spacing: 4 inches o.c.
Traffic Surface: slip resistant
Steel Finish: Hot-dip galvanized with a coating weight of not less than 1.8 oz./sq. ft. of coated surface.

FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36.

B. Steel Bars for Bar Gratings: ASTM A 36.

Wire Rod for Bar Grating Crossbars: ASTM A 510.

Uncoated Steel Sheet: ASTM A 1011, structural steel, Grade 30.

Galvanized-Steel Sheet: ASTM A 653, structural quality, Grade 33, with G90 coating.

FASTENERS

A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

B. Post-Installed Anchors: Chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

FABRICATION

A. Cut, drill, and punch material cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

B. Fit exposed connections accurately together to form hairline joints.

GRATING FRAMES AND SUPPORTS

A. Fabricate from metal shapes, plates, and bars of welded construction to sizes, shapes, and profiles indicated and as necessary to receive gratings. Miter and weld connections for perimeter angle frames. Cut, drill, and tap units to receive hardware and similar items.

Unless otherwise indicated, fabricate from same basic metal as gratings.
Equip units indicated to be cast into concrete or built into masonry with integrally welded anchors as detailed on drawings. Unless otherwise indicated, space anchors maximum 16 inches o.c.

B. Galvanize steel frames and supports in the following locations:

Exterior.
Interior.

STEEL FINISHES

A. Finish gratings, frames, and supports after assembly.

B. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153 for steel and iron hardware and with ASTM A 123 for other steel and iron products.

EXECUTION

3.1 INSTALLATION, GENERAL

Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing gratings. Set units accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

Fit exposed connections accurately together to form hairline joints.

Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

Attach toe plates to gratings by welding at locations indicated.

INSTALLING METAL BAR GRATINGS

A. General: Install gratings to comply with recommendations of referenced metal bar grating standards that apply to grating types and bar sizes indicated, including installation clearances and standard anchoring details.

B. Attach removable units to supporting members with type and size of clips and fasteners indicated or, if not indicated, as recommended by grating manufacturer for type of installation conditions shown.

Attach nonremovable units to supporting members by welding where both materials are same; otherwise, fasten by bolting as indicated above.

ADJUSTING AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055313

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Section 012000 General requirements, apply to this Section.

SUMMARY

A. This Section includes the following:

Rooftop equipment bases and support curbs.
Wood blocking and nailers.
Plywood roof sheathing.
Wood furring.
Plywood backing panels.

Related Sections include the following:

SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
Include copies of warranties from chemical treatment manufacturers for each type of treatment.

DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

Factory mark each piece of lumber with grade stamp of grading agency.
Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX)].

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

Application: Treat items indicated on Drawings, and the following:

Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.
Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.

FIRE-RETARDANT-TREATED MATERIALS

A. General: Comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood).

1. Use Exterior type for exterior locations and where indicated.
Use Interior Type A, unless otherwise indicated.

B. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.

Application: Treat items indicated on Drawings, and the following:

Concealed blocking.
Plywood backing panels.

WOOD PANEL PRODUCTS

A. Plywood: DOC PS-1

ROOF SHEATHING

A. Plywood Roof Sheathing: Exterior, Structural I sheathing.

MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
Nailers.
Rooftop equipment bases and support curbs.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.

For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

PLYWOOD BACKING PANELS

A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch (13-mm) nominal thickness.

FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

For roof sheathing and where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

Power-Driven Fasteners: NES NER-272.

Wood Screws: ASME B18.6.1.

Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

MISCELLANEOUS MATERIALS

A. Adhesives for Gluing Furring to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

Use adhesives that have a VOC content that meets the requirements of 018113 Sustainable Design Requirements.

EXECUTION

3.1 INSTALLATION, GENERAL

Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.

Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

Securely attach rough carpentry work to substrate by anchoring and fasteningIf retaining subparagraph below, verify that this is acceptable to authorities having jurisdiction. Also retain one of the other subparagraphs that references a model code fastener schedule complying with local requirements. Fasteners covered by NES NER-272 are manufactured by member companies of the International Staple, Nail and Tool Association.

Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

Securely attach to substrate by fastening as indicated, complying with the following: Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."

Coordinate roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

Wall and Roof Sheathing:
Screw to cold-formed metal framing.

WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

END OF SECTION 061000

SECTION 071113 – BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.2 SUMMARY

A. Section includes cold-applied, emulsified-asphalt dampproofing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. VOC Content: Products shall comply with VOC content limits of authorities having jurisdiction unless otherwise required.

2.2 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. Brush and Spray Coats: ASTM D 1227, Type III, Class 1.

B. VOC Content: Zero

C. Low-Emitting Materials: Dampproofing shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 AUXILIARY MATERIALS

A. General: Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.

B. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.

1. Primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

PART 3 - EXECUTION

3.1 APPLICATION, GENERAL

A. Comply with manufacturer's written instructions for substrate preparation, dampproofing application, cure time between coats, and drying time before backfilling unless more stringent requirements are indicated.

1. Apply dampproofing to provide continuous plane of protection.
2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.

B. Where dampproofing exterior face of inner wythe of exterior masonry cavity walls, lap dampproofing at least 1/4 inch (6 mm) onto flashing, masonry reinforcement, veneer ties, and other items that penetrate inner wythe.

1. Extend dampproofing over outer face of structural members and concrete slabs that interrupt inner wythe.
2. Lap dampproofing at least 1/4 inch (6 mm) onto shelf angles supporting veneer.

3.2 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. Exterior Face of Inner Wythe of Cavity Walls: Apply primer and one brush or spray coat at not less than 1 gal./100 sq. ft. (0.4 L/sq. m).

END OF SECTION 071113

SECTION 071326 - SELF-ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including Section 012000 General Requirements, apply to this Section.

SUMMARY

A. This Section includes the following:

Modified bituminous sheet waterproofing.

Related Sections include the following:

Section 079200 "Joint Sealants" for joint-sealant materials and installation.

SUBMITTALS

A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.

B. Shop Drawings: Show locations and extent of waterproofing. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

Include setting drawings showing layout, sizes, sections, profiles, and joint details of pedestal-supported concrete pavers.

Samples: For the following products:

12-by-12-inch (300-by-300-mm) square of waterproofing and flashing sheet.

Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.

Qualification Data: For Installer.

Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for waterproofing.

Warranties: Special warranties specified in this Section.

QUALITY ASSURANCE

A. Installer Qualifications: A firm that is approved waterproofing manufacturer for installation of waterproofing required for this Project.

B. Source Limitations: Obtain waterproofing materials through one source from a single manufacturer.

Mockups: Before beginning installation, install waterproofing to 100 sq. ft. (9.3 sq. m) of wall to demonstrate surface preparation, crack and joint treatment, corner treatment, and execution quality.

If Commission Representative determines mockup does not comply with requirements, reapply waterproofing until mockup is approved. Mockup must be approved by the Commission Representative in writing.

Approved mockup may become part of the completed Work if undisturbed at time of Substantial Completion.

DELIVERY, STORAGE, AND HANDLING

A. Deliver liquid materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by waterproofing manufacturer.

Remove and replace liquid materials that cannot be applied within their stated shelf life.

Store rolls according to manufacturer's written instructions.

Protect stored materials from direct sunlight.

PROJECT CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.

Do not apply waterproofing in snow, rain, fog, or mist.

B. Maintain adequate ventilation during preparation and application of waterproofing materials.

WARRANTY

A. Special Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to replace waterproofing material that does not comply with requirements or that fails to remain watertight within specified warranty period.

Failure includes, but is not limited to, failure of waterproofing due to failure of substrate prepared and treated according to requirements or formation of new joints and cracks in substrate exceeding 1/16 inch (1.6 mm) in width.

Warranty Period: Five years from date of Substantial Completion.

PRODUCTS

2.1 MODIFIED BITUMINOUS SHEET WATERPROOFING

Modified Bituminous Sheet: 60-mil- (1.5-mm-) thick, self-adhering sheet consisting of 56 mils (1.4 mm) of rubberized asphalt laminated to a 4-mil- (0.10-mm-) thick, polyethylene film with release liner on adhesive side and formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction. See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. Retain one of first two subparagraphs and list of manufacturers and products below.

Products: Subject to compliance with requirements, provide one of the following:

American Hydrotech, Inc.; VM 75.
American Permaquik Inc.; PQ 7100.
Carlisle Coatings & Waterproofing Inc.; CCW MiraDRI 860/861.
CETCO Building Materials Group; Envirosheet.
Grace, W. R. & Co.; Bituthene 3000
Henry Company; Blueskin WP 200.
Meadows, W. R., Inc.; SealTight Mel-Rol.
Nervastral, Inc.; BITU-MEM.
Pecora Corporation; Duramem 700-SM.
Polyguard Products; Polyguard 650.

Physical Properties:

Tensile Strength: 250 psi (1.7 MPa) minimum; ASTM D 412, Die C, modified.
Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
Low-Temperature Flexibility: Pass at minus 20 deg F (minus 29 deg C); ASTM D 1970.
Crack Cycling: Unaffected after 100 cycles of 1/8-inch (3-mm) movement; ASTM C 836.
Puncture Resistance: 40 lbf (180 N) minimum; ASTM E 154.
Hydrostatic-Head Resistance: 150 feet (45 m) minimum; ASTM D 5385.
Water Absorption: 0.15 percent weight-gain maximum after 48-hour immersion at 70 deg F (21 deg C); ASTM D 570.
Vapor Permeance: 0.05 perms (2.9 ng/Pa x s x sq. m); ASTM E 96, Water Method.

AUXILIARY MATERIALS

A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.

1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.

Primer: Liquid waterborne or solvent-borne primer recommended for substrate by manufacturer of sheet waterproofing material.

Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by manufacturer of sheet waterproofing material.

Substrate Patching Membrane: Low-viscosity, two-component, asphalt-modified coating.

Sheet Strips: Self-adhering, rubberized-asphalt sheet strips of same material and thickness as sheet waterproofing.

Mastic, Adhesives, and Tape: Liquid mastic and adhesives, and adhesive tapes recommended by waterproofing manufacturer.

Detail Tape: Two-sided, pressure-sensitive, self-adhering reinforced tape, 4-1/2 inches (114 mm) wide, with a tack-free protective adhesive coating on one side and release film on self-adhering side.

Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick, predrilled at 9-inch (229-mm) centers.

Protection Course: Extruded-polystyrene board insulation, unfaced, ASTM C 578, Type X, 2 inch (13 mm) thick.

EXECUTION

3.1 EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.

Verify that concrete has cured and aged for minimum time period recommended by waterproofing manufacturer.
Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
Proceed with installation only after unsatisfactory conditions have been corrected.

SURFACE PREPARATION

A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.

Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.

Install sheet strips and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch (1.6 mm).

Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.

Install membrane strips centered over vertical inside corners. Install 3/4-inch (19-mm) fillets of liquid membrane on horizontal inside corners and as follows:

At footing-to-wall intersections, extend liquid membrane each direction from corner or install membrane strip centered over corner.

Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

MODIFIED BITUMINOUS SHEET WATERPROOFING APPLICATION

A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and according to recommendations in ASTM D 6135.

B. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.

Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams and stagger end laps to ensure watertight installation.

When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F (16 deg C).

Apply continuous sheets over sheet strips bridging substrate cracks, construction, and contraction joints.

Seal exposed edges of sheets at terminations not concealed by metal counterflashings or ending in reglets with mastic.

Install sheet waterproofing and auxiliary materials to tie into adjacent waterproofing.

Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.

Install protection course with butted joints over waterproofing membrane immediately.

Correct deficiencies in or remove sheet waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

PROTECTION AND CLEANING

A. Protect waterproofing from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 071326

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Section 012000 General Requirements, apply to this Section.

SUMMARY

A. Section Includes:
Spray polyurethane foam insulation.

ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

INFORMATIONAL SUBMITTALS

A. Product test reports.

Research/evaluation reports.

PART 2 - PRODUCTS

2.1 SPRAY POLYURETHANE FOAM INSULATION

Closed-Cell Polyurethane Foam Insulation: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

Minimum density of 1.5 lb/cu. ft. (24 kg/cu. m), thermal resistivity of 6.2 deg F x h x sq. ft./Btu x in. at 75 deg F (43 K x m/W at 24 deg C).
Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

EXECUTION

3.1 INSTALLATION, GENERAL

Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Spray-Applied Insulation: Apply spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.

Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

END OF SECTION 072100

SECTION 076100 - SHEET METAL ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Section 012000 General Requirements, apply to this Section.

SUMMARY

A. Section includes custom-fabricated, standing-seam sheet metal roofing.

ACTION SUBMITTALS

A. Product Data: For each type of product.

Shop Drawings: For sheet metal roofing.

Show installation layouts, expansion joint locations, fixed points, and keyed details. Distinguish between shop- and field-assembled work.
Include pattern of seams and details of termination points, expansion joints, direction of expansion, roof penetrations, edge conditions, special conditions, and connections to adjoining work.

Samples: For each exposed product and for each color and texture specified.

INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranties.

CLOSEOUT SUBMITTALS

A. Maintenance data.

WARRANTY

A. Special Warranty: Warranty in which Installer agrees to repair or replace components of sheet metal roofing that fail in materials or workmanship within specified warranty period.

Warranty Period: Two years from date of Project Completion.

B. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal roofing that shows evidence of deterioration of factory-applied finishes within specified warranty period.

Finish Warranty Period: 20 years from date of Project Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

General Performance: Sheet metal roofing system including, but not limited to, metal roof panels, cleats, anchors and fasteners, sheet metal flashing integral with sheet metal roofing, fascia panels, trim, underlayment, and accessories, shall comply with requirements without failure due to defective manufacture, fabrication, or installation, or due to other defects in construction. Sheet metal roofing shall remain watertight.

Sheet Metal Roofing Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or indicated on Drawings.

Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

ROOFING SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation or aluminum-zinc alloy-coated steel sheet according to ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation, Grade 40 (Grade 275); with smooth, flat surface; prepainted by coil-coating process to comply with ASTM A 755/A 755M.

Thickness: Nominal 0.028 inch (0.71 mm) unless otherwise indicated.

Exposed Coil-Coated Finish:

Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Color: Match Architect's sample

UNDERLAYMENT MATERIALS

A. Felts: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felts.

B. Self-Adhering, High-Temperature Sheet: Minimum 30 mils (0.76 mm) thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.

Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C) or higher.
Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.

Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. (0.16 kg/sq. m) minimum.

MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete roofing system and as recommended by primary sheet metal manufacturer unless otherwise indicated.

B. Fasteners: Wood screws, annular-threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

General:

Exposed Fasteners: Heads matching color of sheet metal roofing using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of roofing.
Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed; with hex-washer head.
Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.

Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

Solder:

For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead with maximum lead content of 0.2 percent.

Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

Elastomeric Sealant: ASTM C 920, elastomeric polyurethane sealant; of type, grade, class, and use classifications required to seal joints in sheet metal roofing and remain watertight.

Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

ACCESSORIES

A. Sheet Metal Accessories: Provide components required for complete sheet metal roofing assembly including trim, copings, fasciae, corner units, clips, flashings, sealants, gaskets, fillers, metal closures, closure strips, and similar items. Match material and finish of sheet metal roofing unless otherwise indicated.

Cleats: Intermittent and continuous attachment devices for mechanically seaming into joints and formed from the following materials and thicknesses unless otherwise indicated:

Metallic-Coated Steel Roofing: 0.0250-inch- (0.64-mm-) thick stainless steel.

Expansion-Type Cleats: Cleats of a design that allows longitudinal movement of roof panels without stressing panel seams; of same material as other cleats.

Backing Plates: Plates at roofing splices, fabricated from material recommended by SMACNA.

Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible-closure strips; cut or premolded to match sheet metal roofing profile. Provide closure strips where necessary to ensure weathertight construction.

Flashing and Trim: Formed from same material and with same finish as sheet metal roofing, minimum 0.028 inch thick.

B. Roof Curbs: Fabricated from same material and finish as sheet metal roofing, minimum thickness matching the sheet metal roofing, with bottom of skirt profiled to match roof panel and seam profiles; with weatherproof top box and integral full-length cricket. Fabricate curb subframing of nominal 0.062-inch- (1.59-mm-) thick, angle-, C- or Z-shaped, galvanized-steel or stainless-steel sheet. Fabricate curb and subframing to withstand indicated loads of size and height indicated. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

Insulate curbs with 2-inch thick, rigid insulation.
Install wood nailers at tops of curbs.

FABRICATION

A. General: Custom fabricate sheet metal roofing to comply with details shown and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions (panel width and seam height), geometry, metal thickness, and other characteristics of installation. Fabricate sheet metal roofing and accessories in shop to greatest extent possible.

1. Standing-Seam Roofing: Form standing-seam panels with finished seam height of 1-1/2 inches

B. Form exposed sheet metal work to fit substrates with little oil canning; free of buckling and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.

Form and fabricate sheets, seams, strips, cleats, valleys, ridges, edge treatments, integral flashings, and other components of metal roofing to profiles, patterns, and drainage arrangements indicated on Drawings and as required for leakproof construction.

Sheet Metal Accessories: Custom fabricate flashings and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item required. Obtain field measurements for accurate fit before shop fabrication.

EXECUTION

3.1 EXAMINATION AND PREPARATION

Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that tops of fasteners are flush with surface.

Lay out panel arrangement and screw cleats to wood sheathing before installation of sheet metal roofing.

Space fasteners not more than 12 inches o.c. (unless a closer spacing is required by the roofing manufacturer.)

UNDERLAYMENT INSTALLATION

A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal roofing. Apply at locations indicated on Drawings in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

B. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply at locations indicated on Drawings in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.

Apply slip sheet, wrinkle free, before installing sheet metal roofing and related flashing.

INSTALLATION, GENERAL

A. General: Install sheet metal roofing to comply with details shown and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to installation characteristics required unless otherwise indicated on Drawings. Install fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required for complete roofing system and as recommended by fabricator for sheet metal roofing.

Install sheet metal roofing true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

Anchor sheet metal roofing and other components of the Work securely in place, with provisions for thermal and structural movement.

Field cutting of sheet metal roofing by torch is not permitted.

Provide metal closures at peaks, rake edges, rake walls, eaves, fascia and each side of ridge caps.

Flash and seal sheet metal roofing with closure strips at eaves, rakes, and perimeter of all openings. Fasten with self-tapping screws.

Locate and space fastenings in uniform vertical and horizontal alignment. Predrill panels for fasteners.

Install ridge caps as sheet metal roofing work proceeds.

Locate roofing splices over, but not attached to, structural supports. Stagger roofing splices and end laps to avoid four-panel lap splice condition. Install backing plates at roofing splices.

Lap metal flashing over sheet metal roofing to direct moisture to run over and off roofing.

B. Thermal Movement: Rigidly fasten metal roof panels to structure at only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction.

Point of Fixity: Fasten each panel along single line of fixing located at ridge and center of panel length.

Avoid attaching accessories through roof panels in manner that inhibits thermal movement.

Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating, by applying self-adhering sheet underlayment to each contact surface, or by other permanent separation as recommended by sheet metal manufacturer or SMACNA.

Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

CUSTOM-FABRICATED SHEET METAL ROOFING INSTALLATION

A. Fabricate and install work with lines and corners of exposed units true and accurate. Form exposed faces flat and free of buckles, excessive waves, and avoidable tool marks, considering metal temper and reflectivity. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant. Fold back sheet metal to form hem on concealed side of exposed edges unless otherwise indicated.

Install cleats to hold sheet metal panels in position. Attach each cleat with at least two fasteners to prevent rotation.
Space cleats not more than 12 inches (300 mm) o.c. Bend tabs over fastener head.
Provide expansion-type cleats for roof panels that exceed 30 feet (9.1 m) in length.

B. Seal joints as required for watertight construction. For roofing with 3:12 slopes or less, use cleats at transverse seams. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

Standing-Seam Roofing: Attach standing-seam metal panels to substrate with double-fastened cleats spaced at 12 inches (300 mm) o.c. Install panels reaching from eave to ridge before moving to adjacent panels. Before panels are interlocked, apply continuous bead of sealant to top of flange of lower panel. Lock standing seams by folding over twice so cleat and panel edges are completely engaged.

Lock each panel to panel below with sealed transverse seam.
Fold over seams after locking at ridges and hips.

ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for complete sheet metal roofing assembly including trim, copings, seam covers, flashings, sealants, gaskets, fillers, metal closures, closure strips, and similar items.

Install accessories integral to sheet metal roofing that are specified in Section 076200 "Sheet Metal Flashing and Trim" to comply with that Section's requirements.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and install units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

Clean off excess sealants.

Remove temporary protective coverings and strippable films as sheet metal roofing is installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION 076100

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Section 012000 General Requirements, apply to this Section.

SUMMARY

A. Section Includes:
Formed steep-slope roof sheet metal fabrications.
Formed wall sheet metal fabrications.

ACTION SUBMITTALS

A. Product Data: For each type of product.

Shop Drawings: For sheet metal flashing and trim.

Include plans, elevations, sections, and attachment details.
Distinguish between shop- and field-assembled work.
Include identification of finish for each item.
Include pattern of seams and details of termination points, expansion joints and expansion-joint covers, direction of expansion, roof-penetration flashing, and connections to adjoining work.

Samples: For each exposed product and for each color and texture specified.

INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Product test reports.

Sample warranty.

CLOSEOUT SUBMITTALS

A. Maintenance data.

QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

For copings and roof edge flashings that are SPRI ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.

B. Mockups: Build mockups to verify selections made under Sample submittals to demonstrate aesthetic effects and to set quality standards for fabrication and installation.

Build mockup of typical roof edge, eave, including fascia, fascia trim, rake trim approximately 6 feet long for each condition.

WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:

Design Pressure: As indicated on Drawings.

Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces

SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation or aluminum-zinc alloy-coated steel sheet according to ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation, Grade 40 (Grade 275); with smooth, flat surface; prepainted by coil-coating process to comply with ASTM A 755/A 755M.

Thickness: Nominal 0.028 inch (0.71 mm) unless otherwise indicated.

Exposed Coil-Coated Finish:

Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions

Color: As selected by Architect from manufacturer's full range of standard and premium colors.

UNDERLAYMENT MATERIALS

A. Felts: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felts.

B. Self-Adhering, High-Temperature Sheet: Minimum 30 mils (0.76 mm) thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.

Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C) or higher.

Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.

Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. (0.16 kg/sq. m) minimum.

MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal

General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.

Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.

Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

Fasteners for Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

Obtain field measurements for accurate fit before shop fabrication.

Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.

Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
Use lapped expansion joints only where indicated on Drawings.

Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

A. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:
Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

B. Valley Flashing: Fabricate from the following materials:
Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.

Drip Edges: Fabricate from the following materials:
Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

Eave, Rake, and Ridge, Flashing: Fabricate from the following materials:
Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

EXECUTION

3.1 UNDERLAYMENT INSTALLATION

Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

Synthetic Underlayment: Install synthetic underlayment, wrinkle free, according to manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.

Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.

INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
Torch cutting of sheet metal flashing and trim is not permitted.

B. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of **12 feet** with no joints within 24 inches of corner or intersection.

Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
Use lapped expansion joints only where indicated on Drawings.

Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance

Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

Seal joints as required for watertight construction. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

Rivets: Rivet joints in uncoated aluminum where necessary for strength.

ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements**,** sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate.

Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.

Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm).

Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with butyl sealant and clamp flashing to pipes that penetrate roof.

CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

Clean off excess sealants.

Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION 076200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Section 012000 General Requirements apply to this Section.

SUMMARY

A. This Section includes joint sealants for the following applications, including those specified by reference to this Section:

Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces:

Control and expansion joints in unit masonry.
Joints between different materials listed above.
Perimeter joints between materials listed above and frames of doors and windows.
Other joints as indicated.

Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:

Control and expansion joints on exposed interior surfaces of exterior walls.
Perimeter joints of exterior openings where indicated.
Vertical joints on exposed surfaces of interior unit masonry.
Perimeter joints between interior wall surfaces and frames of interior doors and windows.
Joints between plumbing fixtures and adjoining walls, floors, and counters.
Other joints as indicated.

Interior joints in the following horizontal traffic surfaces:

Related Sections include the following:
1. Section 042000 "Unit Masonry" for masonry control and expansion joint fillers and gaskets.

PERFORMANCE REQUIREMENTS

A. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.

Warranty Materials.

QUALITY ASSURANCE

A. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

B. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the Notice to Proceed with the Work.

Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.

Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.

Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.

Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

Mockups: Build mockups incorporating sealant joints, as follow to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:

Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).

When joint substrates are wet.

Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Project Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

Warranty Period: 10 years from date of Project Completion.

Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:

Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
Disintegration of joint substrates from natural causes exceeding design specifications.
Mechanical damage caused by individuals, tools, or other outside agents.
Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

Sealants: 250 g/L.
Sealant Primers for Nonporous Substrates: 250 g/L.
Sealant Primers for Porous Substrates: 775 g/L.

Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

Multicomponent Nonsag Urethane Sealant:

Products:

Sika Corporation, Inc.; Sikaflex - 2c NS TG.
Sonneborn, Division of ChemRex Inc.; NP 2.
Tremco; Vulkem 227.
Tremco; Vulkem 322 DS.

Type and Grade: M (multicomponent) and NS (nonsag).
Class: 25.
Uses Related to Exposure: T (traffic) and NT (nontraffic).
Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

Use O Joint Substrates: Color anodic aluminum, aluminum coated with a high-performance coating, galvanized steel, brick, ceramic tile, and wood.

Single-Component Nonsag Urethane Sealant:

Products:

Sika Corporation, Inc.; Sikaflex - 1a.
Sonneborn, Division of ChemRex Inc.; Ultra.
Sonneborn, Division of ChemRex Inc.; NP 1.
Tremco; Vulkem 116.

Type and Grade: S (single component) and NS (nonsag).
Class: 25.
Uses Related to Exposure: T (traffic) and NT (nontraffic).
Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

Use O Joint Substrates: Color anodic aluminum, aluminum coated with a high-performance coating, galvanized steel, brick, ceramic tile, and wood.

LATEX JOINT SEALANTS

A. Latex Sealant: Comply with ASTM C 834, Type P, Grade NF.

B. Products:

Bostik Findley; Chem-Calk 600.
Pecora Corporation; AC-20+.
Sonneborn, Division of ChemRex Inc.; Sonolac.
Tremco; Tremflex 834.

JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), O (open-cell material), B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

EXECUTION

3.1 EXAMINATION

Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

Concrete.
Masonry.
Unglazed surfaces of ceramic tile.

Remove laitance and form-release agents from concrete.

Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

Metal.
Glass.
Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

Do not leave gaps between ends of sealant backings.
Do not stretch, twist, puncture, or tear sealant backings.
Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

Install sealants using proven techniques that comply with the following and at the same time backings are installed:

Place sealants so they directly contact and fully wet joint substrates.
Completely fill recesses in each joint configuration.
Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

Remove excess sealant from surfaces adjacent to joints.
Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

Installation of Preformed Tapes: Install according to manufacturer's written instructions.

Installation of Preformed Silicone-Sealant System: Comply with the following requirements:

Apply masking tape to each side of joint, outside of area to be covered by sealant system.
Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead 1/4 inch (6 mm) inside masking tape.
Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field test and inspections and prepare test reports.

B. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

Extent of Testing: Test completed elastomeric sealant joints as follows:

Perform 10 tests for the first 1000 feet (300 m) of joint length for each type of elastomeric sealant and joint substrate.
Perform 1 test for each [1000 feet (300 m)] of joint length thereafter or 1 test per each floor per elevation.

Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab in Appendix X1 in ASTM C 1193.

For joints with dissimilar substrates, verify adhesion to each substrate separately; do this by extending cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
Inspect tested joints and report on the following:

Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
Whether sealants filled joint cavities and are free of voids.
Whether sealant dimensions and configurations comply with specified requirements.

Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Section 012000 General Requirements, apply to this Section.

SUMMARY

A. Section Includes:

Standard hollow metal doors and frames.

Related Sections:

Section 042000 "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
Section 087100 "Door Hardware" for door hardware for hollow metal doors.
Section 099113 "Exterior Painting" for field painting hollow metal doors and frames.

DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings.

B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, and finishes.

B. Shop Drawings: Include the following:

Elevations of each door design.
Details of doors, including vertical and horizontal edge details and metal thicknesses.
Frame details for each frame type, including dimensioned profiles and metal thicknesses.
Locations of reinforcement and preparations for hardware.
Details of each different wall opening condition.
Details of anchorages, joints, field splices, and connections.
Details of accessories.
Details of moldings, removable stops, and glazing.

Other Action Submittals:

Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure or as close to neutral pressure as possible according to NFPA 252.

DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

Provide additional protection to prevent damage to finish of factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- (102-mm-) high wood blocking. Do not store in a manner that traps excess humidity.

Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

Amweld Building Products, LLC.
Ceco Door Products; an Assa Abloy Group company.
Curries Company; an Assa Abloy Group company.
Habersham Metal Products Company.
Kewanee Corporation.
Pioneer Industries, Inc.
Steelcraft; an Ingersoll-Rand company.

MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 (ZF120) metallic coating.

Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.

For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.

Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. (96- to 192-kg/cu. m) density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

STANDARD HOLLOW METAL DOORS

A. General: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.

Design: Flush panel.
Core Construction: Manufacturer's standard polyisocyanurate core.

Fire Door Core: As required to provide fire-protection ratings indicated.
Thermal-Rated (Insulated) Doors: Where indicated, provide doors fabricated with thermal-resistance value (R-value) of not less than 12.3 deg F x h x sq.ft./Btu when tested according to ASTM C 1363.

Locations: Exterior doors

Vertical Edges for Single-Acting Doors: Beveled edge.

Beveled Edge: 1/8 inch in 2 inches (3 mm in 50 mm).

Vertical Edges for Double-Acting Doors: Round vertical edges with 2-1/8-inch (54-mm) radius.
Top and Bottom Edges: Closed with flush or inverted 0.042-inch- (1.0-mm-) thick, end closures or channels of same material as face sheets.
Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."

B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 2 (Seamless).

Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

STANDARD HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Exterior Frames: Fabricated from metallic-coated steel sheet.

Fabricate frames with mitered or coped corners.
Fabricate frames as full profile welded unless otherwise indicated.
Frames for Level 3 Steel Doors: 0.053-inch- (1.3-mm-) thick steel sheet.

Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

FRAME ANCHORS

A. Jamb Anchors:

Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (50 mm) wide by 10 inches (250 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.

B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) thick, and as follows:

Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

STOPS AND MOLDINGS

A. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated.

ACCESSORIES

A. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

Hollow Metal Doors:

Exterior Doors: Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
Glazed Lites: Factory cut openings in doors.
Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch (19 mm) beyond edge of door on which astragal is mounted.

Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.

Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.

Jamb Anchors: Provide number and spacing of anchors as follows:

Masonry Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:

Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.

Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.

Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
Double-Door Frames: Drill stop in head jamb to receive two door silencers.

Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.

Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Section 087100 Section "Door Hardware."

Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.

Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.

Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

Coordinate locations of conduit and wiring boxes for electrical connections with electrical plans and specification sections.

Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.

Provide loose stops and moldings on inside of hollow metal work.

Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

STEEL FINISHES

A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

EXECUTION

3.1 EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:

Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.

Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.

Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

At fire-protection-rated openings, install frames according to NFPA 80.

Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.

Install frames with removable glazing stops located on secure side of opening.

Install door silencers in frames before grouting.

Remove temporary braces necessary for installation only after frames have been properly set and secured.

Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.

Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.

Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.

Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.

Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

Non-Fire-Rated Standard Steel Doors:

Jambs and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
Between Edges of Pairs of Doors: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
Between Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).
Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).

Fire-Rated Doors: Install doors with clearances according to NFPA 80.

ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Section 012000 General Requirements, apply to this Section.

SUMMARY

A. This Section includes the following:

Commercial door hardware for the following:

Swinging doors.

Related Sections include the following:

Section 081113 "Hollow Metal Doors and Frames" for astragals provided as part of fire-rated labeled assemblies and for door silencers provided as part of hollow-metal frames.

Products furnished, but not installed, under this Section include the following. Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.

Permanent cores to be installed by Owner.

SUBMITTALS

A. Product Data: Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples for Initial Selection: For each finish, color, and texture required for each type of door hardware indicated.

Samples for Verification: Submit minimum 2-by-4-inch (51-by-102-mm) plate Samples of each type of finish required, except primed finish.

Samples for Verification: For exposed door hardware of each type, in specified finish, full size. Tag with full description for coordination with the door hardware sets. Submit Samples before, or concurrent with, submission of the final door hardware sets.

Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.

Product Certificates: For electrified door hardware, signed by product manufacturer.

Certify that door hardware approved for use on types and sizes of labeled fire doors complies with listed fire door assemblies.

Qualification Data: For Installer.

Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for locks latches and closers.

Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware schedule.

Warranty: Special warranty specified in this Section.

Submittal Sequence: Submit the final door hardware sets at earliest possible date, particularly where approval of the door hardware sets must precede fabrication of other work that is critical in Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the door hardware sets.

QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by lock manufacturer.

1. Installer's responsibilities include supplying and installing door hardware and providing a qualified Architectural Hardware Consultant available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

Installer shall have warehousing facilities in Project's vicinity.

Scheduling Responsibility: Preparation of door hardware and keying schedules.

Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification related to the final door hardware sets, and include basic installation instructions, templates, and necessary fasteners with each item or package.

Deliver keys and permanent cores to Owner by registered mail or overnight package service.

COORDINATION

A. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware, that fail, in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Structural failures including excessive deflection, cracking, or breakage.
Faulty operation of operators and door hardware.
Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

Warranty Period: Three years from date of Substantial Completion, except as follows:
Exit Devices: Two years from date of Project Completion.
Manual Closers: 10 years from date of Project Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

General: Provide door hardware for each door to comply with requirements in this Section.

Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

HINGES, GENERAL

A. Quantity: Provide the following, unless otherwise indicated:

1. Two Hinges: For doors with heights up to 60 inches (1524 mm).
Three Hinges: For doors with heights 61 to 90 inches (1549 to 2286 mm).
Four Hinges: For doors with heights 91 to 120 inches (2311 to 3048 mm).
For doors with heights more than 120 inches (3048 mm), provide 4 hinges, plus 1 hinge for every 30 inches (750 mm) of door height greater than 120 inches (3048 mm).

Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

Hinge Weight: Unless otherwise indicated, provide the following:

Entrance Doors: Heavy-weight hinges.
Doors with Closers: Antifriction-bearing hinges.
Interior Doors: Standard-weight hinges.

Hinge Base Metal: Unless otherwise indicated, provide the following:

Exterior Hinges: Stainless steel, with stainless-steel pin.
Interior Hinges: Stainless steel, with stainless-steel pin.
Hinges for Fire-Rated Assemblies: Stainless steel, with stainless-steel pin.

Hinge Options: Where indicated in door hardware sets or on Drawings:
Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for outswinging exterior doors and outswinging corridor doors with locks.
Corners: Square.

Fasteners: Comply with the following:

Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
Wood Screws: For wood doors and frames.
Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
Screws: Phillips flat-head; machine screws (drilled and tapped holes) for metal doors. Finish screw heads to match surface of hinges.

HINGES

A. Butts and Hinges: BHMA A156.1.

B. Template Hinge Dimensions: BHMA A156.7.

Manufacturers:

Hager Companies (HAG).
Lawrence Brothers, Inc. (LB).
McKinney Products Company; an ASSA ABLOY Group company (MCK).
Stanley Commercial Hardware; Div. of The Stanley Works (ST).

LOCKS AND LATCHES, GENERAL

A. Accessibility Requirements: Where indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22 N).

B. Latches and Locks for Means of Egress Doors: Comply with NFPA 101. Latches shall not require more than 15 lbf (67 N) to release the latch. Locks shall not require use of a key, tool, or special knowledge for operation.

Lock Trim:

Levers: Cast.

15H.

Escutcheons (Roses): Wrought.

Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

Mortise Locks: Minimum 3/4-inch (19-mm) latchbolt throw.
Deadbolts: Minimum 1-inch (25-mm) bolt throw.

Rabbeted Meeting Doors: Provide special rabbeted front and strike on locksets for rabbeted meeting stiles.

Backset: 2-3/4 inches (70 mm), unless otherwise indicated.

Strikes: Manufacturer's standard strike with strike box for each latchbolt or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, and as follows:

Strikes for Mortise Locks and Latches: BHMA A156.13.
Strikes for Interconnected Locks and Latches: BHMA A156.12.
Strikes for Auxiliary Deadlocks: BHMA A156.5.

MECHANICAL LOCKS AND LATCHES

A. Lock Functions: Function numbers and descriptions indicated in door hardware sets comply with the following:

1. Mortise Locks: BHMA A156.13.

B. Mortise Locks: Stamped steel case with steel or brass parts; BHMA A156.13, Grade 1; Series 1000.

Manufacturers:

Best Access Systems; Div. of The Stanley Works (BE). Model 45H Series

DOOR BOLTS

A. Bolt Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

Mortise Flush Bolts: Minimum 3/4-inch (19-mm) throw.

B. Dustproof Strikes: BHMA A156.16, Grade 1.

Automatic and Self-Latching Flush Bolts: BHMA A156.3, Grade 1; designed for mortising into door edge.

Manufacturers:

Door Controls International (DCI).
Glynn-Johnson; an Ingersoll-Rand Company (GJ).
Hager Companies (HAG).
IVES Hardware; an Ingersoll-Rand Company (IVS).
Rockwood Manufacturing Co. (RO)

EXIT DEVICES

A. Exit Devices: BHMA A156.3, Grade 1.

B. Accessibility Requirements: Where handles, pulls, latches, locks, and other operating devices are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22 N).

Exit Devices for Means of Egress Doors: Comply with NFPA 101. Exit devices shall not require more than 15 lbf (67 N) to release the latch. Locks shall not require use of a key, tool, or special knowledge for operation.

Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.

Fire Exit Devices: Devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.

Outside Trim: Pull with cylinder; material and finish to match locksets, unless otherwise indicated.

Match design for locksets and latchsets, unless otherwise indicated.

Manufacturers:

Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company (CR). Model 5000
Von Duprin; an Ingersoll-Rand Company (VD). Model 98 Series
Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL). Model 7000 Series
Precision Hardware; Division of The Stanley Works.(PR) Model Apex 2000

LOCK CYLINDERS

A. Standard Lock Cylinders: BHMA A156.5, Grade 1.

B. Cylinders: Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:

Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.

Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:

Removable Cores: Core insert, removable by use of a special key; for use only with core manufacturer's cylinder and door hardware.

Construction Keying: Comply with the following:

Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.
Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

Replace construction cores with permanent cores as directed by Owner.

Manufacturers:

Best Access Systems; Div. of The Stanley Works (BE).

KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference, and as follows:

1. Existing System: Master key or grand master key locks to Owner's existing system.

B. Keys: Nickel silver.

Stamping: Permanently inscribe each key with a visual key control number and include the following notation:

Notation: Information to be furnished by Owner.

CLOSERS

A. Accessibility Requirements: Where handles, pulls, latches, locks, and other operating devices are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. Comply with the following maximum opening-force requirements:

Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

B. Door Closers for Means of Egress Doors: Comply with NFPA 101. Door closers shall not require more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.

Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

Surface Closers: BHMA A156.4, Grade 1. Provide type of arm required for closer to be located on non-public side of door, unless otherwise indicated.

Manufacturers:

DORMA Architectural Hardware; Member of The DORMA Group North America (DAH). Model 8916 Series
LCN Closers; an Ingersoll-Rand Company (LCN). Model 4041 Series
Norton Door Controls; an ASSA ABLOY Group company (NDC). Model 7500 Series
Stanley Closers; Division of The Stanley Works (ST). Model D-4550 Series
Sargent Manufacturing; An Assa-Abloy Group Company. Model 351 Series

Concealed Closers: BHMA A156.4, Grade 1.

Manufacturers:

DORMA Architectural Hardware; Member of The DORMA Group North America (DAH).
LCN Closers; an Ingersoll-Rand Company (LCN).
Norton Door Controls; an ASSA ABLOY Group company (NDC).
Rixson Specialty Door Controls; an ASSA ABLOY Group company (RIX).

Coordinators: BHMA A156.3.

STOPS AND HOLDERS

A. Stops and Bumpers: BHMA A156.16, Grade 1.

Provide floor stops for doors unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic. Where floor or wall stops are not appropriate, provide overhead holders.

B. Silencers for Metal Door Frames: BHMA A156.16, Grade 1; neoprene or rubber, minimum diameter 1/2 inch (13 mm); fabricated for drilled-in application to frame.

DOOR GASKETING

A. Standard: BHMA A156.22.

B. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

Air Leakage: Not to exceed 0.50 cfm per foot (0.000774 cu. m/s per m) of crack length for gasketing other than for smoke control, as tested according to ASTM E 283.

Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke-control ratings indicated, based on testing according to UL 1784.

Provide smoke-labeled gasketing on 20-minute-rated doors and on smoke-labeled doors.

Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.

Test Pressure: After 5 minutes into the test, neutral pressure level in furnace shall be established at 40 inches (1016 mm) or less above the sill.

Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.

Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

Gasketing Materials: ASTM D 2000 and AAMA 701/702.

THRESHOLDS

A. Standard: BHMA A156.21.

B. Accessibility Requirements: Where thresholds are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.

Thresholds for Means of Egress Doors: Comply with NFPA 101. Maximum 1/2 inch (13 mm) high.

Manufacturers:

National Guard Products (NG).
Pemko Manufacturing Co. (PEM).
Reese Enterprises (RE).
Zero International (ZRO).

FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.

Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

Steel Machine or Wood Screws: For the following fire-rated applications:

Mortise hinges to doors.
Strike plates to frames.
Closers to doors and frames.

Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."

FINISHES

A. Standard: BHMA A156.18, finish 32D.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

EXECUTION

3.1 EXAMINATION

Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

A. Steel Doors and Frames: Comply with DHI A115 Series.

Surface-Applied Door Hardware: Drill and tap doors and frames according to ANSI A250.6.

INSTALLATION

A. Mounting Heights: Mount door hardware units at heights indicated as follows unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in painting sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."

ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

Door Closers: Unless otherwise required by authorities having jurisdiction, adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.

CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

DOOR HARDWARE SCHEDULE

SET #1

Door: 002A

4	Hinges	FBB199 4 1/2 X 4 1/2 NRP	US32D	ST
1	Lockset	45H-7D15H STD	630	BE
1	Rim Cylinder	1E-72 STD R704	626	BE
1	Mortise Cylinder	1E-74 STD R704	626	BE
1	Door Closer	D-4550 HCS	AL	ST
1	Door Stop	480	US26D	RO
1	Saddle Threshold	425	AL	NA
1	Gasketing	A617 A		NA
1	Door Bottom	318 V		NA

NOTE: IF ELECTRICAL ROOMS ARE IN EXCESS OF 1200 AMPS EXIT DEVICES ARE REQUIRED PER NEC (GC to coordinate and provide if necessary)

SET #2

Doors: 001A

8	Hinges	FBB199 4 1/2 X 4 1/2	US32D	ST
1	Set Automatic Bolts	1842	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Coordinator	1672	PC	RO
2	Mounting Bracket	1601AB	PC	RO
1	Lockset	45H-7D15H STD	630	BE
2	Door Closer	D-4551 STD W/PA BRKT	AL	ST
2	Protection Plate	K1050 10" X 1" LDW X B4E X CSK	US32D	RO
2	Door Stop	409 Or 441CU As Required	US26D	RO
1	Smoke Seal	5020 C		NA
1	Astragal Set	9125 A SET		NA

NOTE: Metal Astragal provided by door supplier -

END OF SECTION 087100

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Section 012000 General requirements, apply to this Section.

SUMMARY

A. This Section includes surface preparation and the application of paint systems on the following exterior substrates:

Steel.

Hollow Metal doors and frames.

Related Sections include the following:

Section 081113 for factory primed frames and doors and priming of metal substrates with primers specified in this Section.

SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each type of paint system and each color and gloss of topcoat indicated.

Submit Samples on rigid backing, 8 inches (200 mm) square.
Step coats on Samples to show each coat required for system.
Label each coat of each Sample.
Label each Sample for location and application area.

Product List: For each product indicated, include the following:

Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with Master Painters Institute (MPI) standards indicated and listed in "MPI Approved Products List."

Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue. Remove rags and waste from storage areas daily.

PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

EXTRA MATERIALS

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

Quantity: Furnish an additional 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

Benjamin Moore & Co.
Duron, Inc.
ICI Paints..
PPG Architectural Finishes, Inc.
Sherwin-Williams Company (The).

PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

Colors: As selected by Engineer from manufacturer's full range.

METAL PRIMERS

A. Alkyd Anticorrosive Metal Primer: MPI #79.

EXTERIOR ALKYD PAINTS

A. Exterior Alkyd Enamel (Semigloss): MPI #94 (Gloss Level 5).

EXECUTION

3.1 EXAMINATION

Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.

APPLICATION

A. Apply paints according to manufacturer's written instructions.

Use applicators and techniques suited for paint and substrate indicated.

Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by the Commission Representative, and leave in an undamaged condition.

At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

EXTERIOR PAINTING SCHEDULE

A. Steel Substrates:

Alkyd System: MPI EXT 5.1D.

Prime Coat: Alkyd anticorrosive metal primer.
Intermediate Coat: Exterior alkyd enamel matching topcoat.
Topcoat: Exterior alkyd enamel semigloss.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Section 012000 General Requirements, apply to this Section.

SUMMARY

A. This Section includes surface preparation and the application of paint systems on the following interior substrates:

Concrete masonry units (CMU).
Steel.
Gypsum board.
Concrete.

Related Sections include the following:

Section 055000 for shop priming of metal substrates with primers specified in this Section.
Section 099113 "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.

SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat indicated.

Submit Samples on rigid backing, 8 inches (200 mm) square.
Step coats on Samples to show each coat required for system.
Label each coat of each Sample.
Label each Sample for location and application area.

Product List: For each product indicated, include the following:

Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
Printout of current Master Painters Institute (MPI) Approved Products List for each product category specified in Part 2, with the proposed product highlighted.

QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."

DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue. Remove rags and waste from storage areas daily.

PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

EXTRA MATERIALS

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

Quantity: Furnish an additional **5** percent, but not less than 1 gal. (3.8 L) of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Benjamin Moore & Co.
Duron, Inc.
ICI Paints.
PPG Architectural Finishes, Inc.
Sherwin-Williams Company (The).

PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Chemical Components of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions; these requirements do not apply to primers or finishes that are applied in a fabrication or finishing shop:

Flat Paints and Coatings: VOC content of not more than 50 g/L.
Nonflat Paints and Coatings: VOC content of not more than 150 g/L.
Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
Restricted Components: Paints and coatings shall not contain any of the following:

Acrolein.
Acrylonitrile.
Antimony.
Benzene.
Butyl benzyl phthalate.
Cadmium.
Di (2-ethylhexyl) phthalate.
Di-n-butyl phthalate.
Di-n-octyl phthalate.
1,2-dichlorobenzene.
Diethyl phthalate.
Dimethyl phthalate.
Ethylbenzene.
Formaldehyde.
Hexavalent chromium.
Isophorone.
Lead.
Mercury.

Methyl ethyl ketone.
Methyl isobutyl ketone.
Methylene chloride.
Naphthalene.
Toluene (methylbenzene).
1,1,1-trichloroethane.
Vinyl chloride.

Colors: As selected by Engineer from manufacturer's full range.

BLOCK FILLERS

A. Interior/Exterior Latex Block Filler: MPI #4.

PRIMERS/SEALERS

A. Interior Latex Primer/Sealer: MPI #50.

METAL PRIMERS

A. Rust-Inhibitive Primer (Water Based): MPI #107.

LATEX PAINTS

A. Institutional Low-Odor/VOC Latex (Semigloss): MPI #147 (Gloss Level 5).

B. Institutional Low-Odor/VOC Latex (Gloss): MPI #148 (Gloss Level 6).

EXECUTION

3.1 EXAMINATION

Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

Concrete: 12 percent.
Masonry (Clay and CMU): 12 percent.
Gypsum Board: 12 percent.

Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

Concrete Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.

Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.

APPLICATION

A. Apply paints according to manufacturer's written instructions.

Use applicators and techniques suited for paint and substrate indicated.

Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

Painting Mechanical and Electrical Work: Paint items exposed in equipment rooms and occupied spaces including, but not limited to, the following:

Mechanical Work:

Uninsulated metal piping.
Uninsulated plastic piping.
Pipe hangers and supports.
Tanks that do not have factory-applied final finishes.
Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
Mechanical equipment that is indicated to have a factory-primed finish for field painting.

Electrical Work:

Switchgear.
Panelboards.
Electrical equipment that is indicated to have a factory-primed finish for field painting.

FIELD QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:

1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.

Testing agency will perform tests for compliance with product requirements.
Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying-paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

Institutional Low-Odor/VOC Latex System: MPI INT 3.1M.

Prime Coat: Institutional low-odor/VOC interior latex matching topcoat.
Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
Topcoat: Institutional low-odor/VOC interior latex (semigloss).

B. CMU Substrates:

Institutional Low-Odor/VOC Latex System: MPI INT 4.2E.

Prime Coat: Interior/exterior latex block filler.
Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
Topcoat: Institutional low-odor/VOC interior latex **(**semigloss).

Steel Substrates:

Institutional Low-Odor/VOC Latex System: MPI INT 5.1S.

Prime Coat: Rust-inhibitive primer (water based).
Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
Topcoat: Institutional low-odor/VOC interior latex **(**semigloss). Topcoat on door frames to be (gloss).

Gypsum Board Substrates:

Institutional Low-Odor/VOC Latex System: MPI INT 9.2M.

Prime Coat: Interior latex primer/sealer.
Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
Topcoat: Institutional low-odor/VOC interior latex (semigloss).

END OF SECTION 099123

SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Section 012000 General Requirements, apply to this Section.

SUMMARY

A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

SUBMITTALS

A. Product Data: For each type of product indicated. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.

Product Schedule: For fire extinguishers. Coordinate final fire extinguisher schedule with fire protection cabinet schedule to ensure proper fit and function.

Additional requirements as defined in Section 012000 for "Submittal Procedures" and "Informational Submittals".

"Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

QUALITY ASSURANCE

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Failure of hydrostatic test according to NFPA 10.
Faulty operation of valves or release levers.

Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

Fire Extinguishers: Type, size, and capacity for each fire protection cabinet and mounting bracket indicated.

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

Badger Fire Protection; a Kidde company.
J. L. Industries, Inc.; a division of Activar Construction Products Group.
Kidde Residential and Commercial Division; Subsidiary of Kidde plc.
Larsen's Manufacturing Company.
Potter Roemer LLC.

Valves: Manufacturer's standard.
Handles and Levers: Manufacturer's standard.
Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging.

Regular Dry-Chemical Type in Steel Container: UL-rated 40-B:C, 6-lb nominal capacity, with sodium bicarbonate-based dry chemical in enameled-steel container.

Carbon Dioxide Type: UL-rated 10-B:C, 15-lb nominal capacity, with carbon dioxide in manufacturer's standard enameled-metal container.

MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.

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

Badger Fire Protection; a Kidde company.
J. L. Industries, Inc.; a division of Activar Construction Products Group.
Kidde plc.
Larsen's Manufacturing Company.
Potter Roemer LLC.

B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.

Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

Orientation: Vertical.

EXECUTION

3.1 EXAMINATION

Examine fire extinguishers for proper charging and tagging.

Remove and replace damaged, defective, or undercharged fire extinguishers.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.

Mounting Brackets: 42 inches above finished floor to top of fire extinguisher.

B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION 104416

DIVISION 15 – PUMP STATION MECHANICAL WORK
SECTION 150000 - GENERAL MECHANICAL PROVISIONS

PART 1 - GENERAL

1.1 Scope of Pump Station Mechanical Work

A. The scope of work under Division 15 shall be all mechanical work required for the pump station and provide natural gas service as shown or specified.

B. The mechanical work shall include the furnishing and installing of various items of mechanical equipment and appurtenances. Unless otherwise specifically indicated, electrical work shown on the electrical drawings is included in Division 16. Any additions or modifications to the work shown on the electrical drawings required for the proper installation or operation of work under Division 15 shall be provided under this Division, at no additional cost to the Owner, in conformance with the requirements of Division 16. The Contractor shall be responsible for ascertaining the extent of electrical connections required for items furnished under Division 15, for ascertaining the extent of electrical work shown on the electrical drawings and for coordinating the electrical work accordingly.

C. The specifications and drawings are intended to generally define the work required, but they do not include every equipment and installation detail. The work shall include all items and appurtenances required to fully complete the work, whether specifically identified or not, such that the electrical systems are complete and operational.

D. Furnishing and installing of work under Division 15 shall comply with Section 012000 – General Requirements.

1.2 Code Compliance

A. Unless otherwise indicated, in the absence of more stringent requirements in the Specifications or on the Drawings, the work shall be in compliance with the requirements of applicable codes, as a minimum.

1.3 Standards

A. Where the following abbreviations are used in these Specifications, or on the Drawings, they are to be construed the same as the respective expressions represented:

MHSWPS	Manual for Highway Storm Water Pumping Station
AASHTO	American Association of State Highways and Transportation Officials
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWG	American Wire Gauge
AWWA	American Water Works Association
IPCEA	Insulated Power Cable Engineers Association
IES	Illuminating Engineering Society of North America
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association

NESC	National Electrical Safety Code
UL	Underwriter's Laboratories
HIS	Hydraulic Institute Standard
FM	Factory Mutual
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association

B. Wherever a reference is made to a standard or standard specification, the reference shall be to the edition current at the time of bidding, including any revisions or amendments.

1.4 Verification of Contract Drawings

A. The Contractor shall familiarize himself with the details of the total construction insofar as they may affect the work under Division 15, including floor elevations, physical dimensions of structures, materials of construction and the nature of work required under other Divisions. No additional compensation will be granted for failure to consider the total project work.

B. The contract drawings (Drawings) for mechanical work are generally diagrammatic and do not necessarily depict all items to scale. The Drawings indicate the general locations of major elements of the work, however, field conditions or interferences, may require changes in the installation. The Contractor shall coordinate his work to avoid interferences and shall obtain approval prior to making any changes from the installation shown.

C. Prior to installation, the Engineer may make reasonable minor changes in the locations of the installation. No additional compensation will be granted for such minor changes.

D. The electrical work shown on the electrical drawings (or on electrical portions of multi-trade drawings) shall be provided under Division 16. Any changes in the electrical installation required for the proper installation or operation of items provided under Division 16 shall be provided under this Division in full conformance with the requirements of Division 16. In other words, if a change to the electrical work is required to accommodate equipment provided under Division 15, that change shall be the responsibility of Division 15 and it must be in full compliance with the requirements of Division 16.

1.5 Coordination

A. The Contractor shall coordinate the work under this Division with the work of other trades. This shall include an orderly exchange of information and shall be accomplished such that the total work is not delayed and that interference is avoided.

1.6 Workmanship

A. The mechanical work shall be performed in a neat and workmanlike manner in accordance with the best practices of the trade.

B. Unless otherwise indicated, all materials and equipment shall be installed in accordance with the manufacturer's recommendations.

1.7 Protection of Work

A. All mechanical work, including equipment and appurtenances, shall be protected from damage until final acceptance. Equipment shall be covered to protect against dirt, moisture, paint and the like. The work shall be protected from mechanical injury by appropriate covering or shielding.

B. Prior to final acceptance, protective measures shall be removed and equipment and items shall be cleaned as required to deliver the installation to the State in clean, undamaged condition.

1.8 Clean-up and Safety

A. The work site shall be maintained in a clean condition, free of hazards, all in conformance with the requirements of Article 107 of the Standard Specifications. Special care shall be taken to assure that systems are not left in a hazardous condition.

1.9 Materials and Equipment

A. Quality

1. All materials, equipment and appurtenances shall be new, shall be suitable for the application and shall be the product of established, reputable manufacturers.

B. Standards

1. The construction, sizes, ratings and capacities of items shall be in conformance with the requirements of the codes and with ASTM and ASME standards, as applicable.

C. UL and/or FM Label

1. Unless otherwise indicated, materials and equipment shall bear the UL and/or FM label whenever such labeling is available for the type of material or equipment being furnished.

D. Other Requirements

1. Refer to Section 012000 - General Requirements for other requirements relating to materials and equipment.

1.10 Erecting and Jointing Interior Piping

A. Description

1. This section includes furnishing of supports and hangers and installation of all interior piping and supports.
2. Piping of the materials, coatings and linings shown or specified shall be installed and supported at the locations specified or where shown.

B. Delivery, Storage and Handling

1. All products and materials shall be delivered, stored and handled as specified in Section 012000 - General Requirements.
2. Extreme care shall be taken in loading and unloading the pipe and fittings. The work shall be done slowly using skids or suitable power equipment keeping the pipe under control at all times.

3. Under no condition is the pipe to be dropped, bumped, dragged, pushed or moved in any way that will cause damage to the pipe, lining or coating.
4. When handling the pipe with a crane, a suitable pipe hook or sling shall be used around the pipe. Under no condition is the sling to be allowed to pass through the pipe unless adequate measures are taken to prevent damage to the pipe ends, lining and coating.
5. Any piping or fittings damaged in the process of delivery, storing, handling, or laying shall be replaced or repaired as approved.

C. The interior of pipelines shall be cleaned of all dirt and superfluous material of every description in an approved manner.

D. All bolts shall be primed by dipping with a bituminous coating, except the threads, which are coated immediately prior to installation of the nuts.

E. All threads shall be coated with a suitable pipe dope, Masters Metallic Compound, graphite and engine oil, or equal, before jointing.

F. Installed piping shall be free of sags or bends.

G. Piping shall be installed to allow for expansion and contraction without stressing pipe, joints or connected equipment.

H. The fire rated integrity shall be maintained where pipes pass through fire rated walls, partitions, ceilings, and floors.

I. Pipelines shall be fitted and installed in a neat and workmanlike manner in accordance with approved shop drawings.

J. Flanged joints shall be made with bolts or bolt studs with a nut on each end.

K. Welding of pipe joints shall conform to the requirements of ANSI B31.1 unless otherwise specified. All off site welding of steel pipe shall conform to the appropriate requirements.

1. Pipe and fittings with wall thickness of 3/16-inch and larger shall have ends beveled for welding. Parts to be welded shall be securely held in place and in proper alignment during welding.
2. The abutting pipe ends shall be separated before welding to permit complete fusion to the inside wall of the pipe without overlapping.
3. Welding shall be continuous around the joint and completed without interruption.
4. Welds shall be of the single v butt type, of sound weld metal thoroughly fused into the ends of the pipe and into the bottom of the v.
5. Welds shall be free from cold shuts, pinholes, oxide inclusions or other defects.

L. Anchors and stands shall be furnished and installed when specified, shown, or required for holding the pipelines and equipment in position or alignment. Where adjustable supporting devices are not required, pipelines 3 inches in diameter and smaller shall be supported on cast-iron, malleable iron, or steel hooks, hook plates, rings or ring plates.

M. Hangers and Supports

1. Pipe hangers shall be provided at each change in pipe direction, on both sides of pipe mounted valves and equipment and on both sides of pipe loops and expansion absorbing devices.
2. Brackets shall be used for the support of piping from vertical surfaces.
3. Anchors shall be furnished and installed when specified, shown, or required for holding the pipelines and equipment in position or alignment.
4. Hangers and supports shall be installed to allow controlled movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.
5. Hangers shall be adjusted to distribute loads equally on the attachment and to achieve any indicated slope of the pipe.

N. For sleeve type couplings, equally tighten diametrically opposite bolts on the coupling to bring the gaskets up evenly all around the pipe. Final tightening shall be done with torque wrenches set for the torque recommended by the coupling manufacturer.

O. All piping shall be installed in accordance with the manufacturer's recommendations and approved Shop Drawings and as specified in Section 012000 - General Requirements.

P. After installation of the interior piping and supports, control equipment and all appurtenances, the units shall be subjected to a field running test, as specified in Section 012000 - General Requirements, under actual operating conditions. Where field welding of pipe joints shown, specified, permitted, or required meet the requirements of ASME/ANSI B31.1 -Power Piping, Chapter VI Section 137.4 Hydrostatic Testing. Testing of pipelines shall be in accordance with the requirements of Section 150000, sub-section 12.

1.11 Leakage Tests

A. Leakage tests shall be performed for any signs of leakage in all pipelines and structures required to be watertight.

B. Leaks shall be repaired by replacing broken pipe or joint assemblies found to leak at no addition to the Contract Price.

1.12 Balancing

A. The HVAC Contractor shall hire an independent, qualified and certified member of NEBB or AABC to completely balance the air systems, as required. The Test and Balance Contractor shall submit a project certification guarantee and certified balance report to the Engineer for approval before final acceptance.

B. Adjust all supply and exhaust devices to plus or minus 5 percent of design airflow quantities.

C. The balancing contractor shall report any deficiencies to the Engineer and Mechanical Contractor. The Test and Balance Contractor shall also recommend possible actions to remedy the deficiencies.

D. In general, the Mechanical Contractor shall change fan sheaves, belts, drives, etc. to remedy the deficiencies at no additional cost to the owner.

1.13 Testing

A. All mechanical equipment and systems provided under this Division shall be adjusted and tested. The Contractor shall adjust, repair or replace faulty or improper Division 15 work or equipment discovered during testing.

B. Tests may be made progressively as portions of the work are complete.

C. Tests shall be made in the presence of the Engineer.

D. The Contractor shall maintain a written record of tests and, when complete, it shall be submitted for the record.

E. The Contractor shall perform all tests necessary to assure proper functioning of materials and equipment. Specific special required tests shall be as described in individual equipment specifications; however, the absence of a specific test requirement does not relieve the Contractor from responsibility to adequately test the equipment and systems for proper operation.

F. Except where otherwise specifically indicated, testing must be complete prior to final inspection. All instruments, tools, etc., required for the tests shall be provided by the Contractor. Additional testing may be requested by the Engineer during final inspection to spot-check test results or to demonstrate proper functioning of the systems. These tests shall be performed by the Contractor at no additional cost to the State.

1.14 Record Drawings

A. Alterations and additions to the mechanical installation depicted on the contract drawings made during the execution of the work shall be neatly and plainly marked in red on a set of Record Drawings kept at the contractor's field office for the project. These drawings shall be updated as the work progresses and shall be available for inspection during the course of the work.

B. Record Drawings shall be prepared and submitted in electronic format and in accordance with Section 012000 - General Requirements.

1.15 Data to be Filed with the Owner

A. Certain data, as specified herein, shall be furnished to the Owner when installation and testing are complete, before final acceptance.

B. The data shall be compiled in 8-1/2 x 11 inch format in high quality heavyweight, hard cover binders with piano style metal hinges or in an alternate approved format. Large drawings and other materials that would be opened or removed for reading shall be provided with heavy clear plastic pouches within the binders. The number of binders shall be as required to hold all required material without overfilling. Various sections, as appropriate shall have suitable dividers. All volumes shall be labeled.

C. Four sets of the data files shall be provided.

D. As a minimum, the data files shall include:

1. A table of contents.
2. Approved final shop drawings and product data for all equipment materials incorporated in the work under this Division.
3. Manufacturer's maintenance manuals for all equipment furnished under this Division for which the manufacturer recommends maintenance.

E. All data shall be neat and clearly legible. The table of contents and tabulations of set points and other recorded test data shall be typed. Sloppy, illegible, inaccurate, or incomplete data will not be accepted.

F. See Section 012000 - General Requirements for further requirements.

1.16 Final Acceptance Inspection

A. When the work is complete, tested and fully operational and only after the Record Drawings have been reviewed and accepted, the Contractor shall schedule a Final Acceptance Inspection with the Engineer.

B. The Final Acceptance Inspection shall be made for the complete work at the facility as a whole and shall be as further described in Section 105 of the Standard Specifications.

1.17 Guarantees

A. Guarantees shall be provided for equipment, materials and work provided under this Division as specified in respective sections.

1.18 Maintenance

A. During the course of the construction work and until final acceptance, the Contractor shall be responsible for maintenance and operational integrity of the facility as specified in Section 012000 - General Requirements.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 Natural Gas Service

A. Work shall include all equipment and appurtenances required for complete and operational permanent natural gas service. Ameren Illinois is the utility for natural gas service. The contact person for the new service is Dennis E. Brown, New Construction Engineering, Telephone No.: (217) 479-5231.

B. The Drawings and Specifications indicate the general nature of work required for providing new gas service. The Contractor shall verify the service requirements, shall ascertain the installation requirements and the items of equipment and appurtenances being furnished by the utility and shall provide all other material and work required for a complete installation.

C. All gas service work must conform to the requirements of the utility company.

D. The Contractor shall obtain approval of the utility company for the gas service and metering prior to installation. Copies of approved documents and drawings shall be submitted to the Engineer for the record prior to installation.

E. The Contractor shall pay any charges by the utility company to provide the gas service. The Contractor will be paid for these charges separately under GAS UTILITY SERVICE CONNECTION pay item as specified in article 1.5 of Section 011000.

END OF THIS SECTION 150000

SECTION 150010 - BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 Description

A. Basic materials and methods specified herein shall be incorporated in the work wherever applicable unless specifically indicated otherwise.

B. The basic materials and methods specified herein are intended to define a minimum standard of quality and workmanship.

1.2 Concrete

A. Concrete for equipment bases and other work under this Section shall be provided under this Section in conformance with Section 503 of IDOT Standard Specifications.

1.3 Cutting and Patching

A. All cutting and patching of building materials required for work under this Section shall be provided under this Section.

B. Cutting and patching shall be provided under this Section in conformance with IDOT Standard Specifications.

1.4 Fasteners

A. Fasteners used to mount pipe supports and other items attached to the structure shall be suitable for the weight supported and shall be compatible with the structure material, i.e. wood screws shall be used for wood, toggle bolts shall be used for hollow masonry, expansion bolts or power-set studs shall be used for solid masonry, drilled adhesive anchors shall be used for concrete and clamps shall be used for structural steel.

1.5 Support and Anchors

A. This section includes requirements for providing all hanging and supporting devices of construction shown, specified, or required for pipelines, apparatus, HVAC system, plumbing, miscellaneous system, and equipment other than electrical equipment.

B. Submittals

1. All submittals, including the following, shall be provided.
2. Shop drawings shall be submitted to show the quantity, type, design and location of all supports, hangers and anchors required.

C. Supporting devices adequate to maintain the pipelines, apparatus, and equipment in proper position and alignment under all operating and testing conditions with due allowance for expansion and contraction shall be provided.

D. Supporting devices shall be designed in accordance with best practices. When medium or heavy brackets are bolted to vertical surfaces, backplates of adequate size and thickness shall be furnished and installed to distribute the load against the vertical surfaces. When the use of backplates is not practicable, the brackets shall be fastened to the vertical surfaces in such a manner that the safe bearing strength of the vertical surfaces will not be exceeded.

E. Piping shall be connected, supported and guided to permit and control pipe expansion and contraction and to accommodate building expansion, contraction and settling without damage to the piping or support system.

1. Anchors shall be furnished and installed when specified, shown, or required for holding the pipelines and equipment in position or alignment. Anchors shall be designed for rigid fastening to the structures, either directly or through brackets.
2. Anchors shall be cast-iron chair type anchors for piping with steel straps, except where anchors form an integral part of pipefittings or where an anchor of special design is required.
3. Inserts shall be stainless steel concrete inserts. Inserts shall be designed to permit the rods to be adjusted horizontally in one plane and to lock the rod nut or head automatically. Inserts shall be recessed near the upper flange to receive reinforcing rods. Inserts shall be designed so that they may be held in position during concrete placing operations. Inserts shall be designed to carry safely the maximum load that can be imposed by the rod that they engage.

F. Hanger and supports shall be installed in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Section 012000 - General Requirements and Section 150000.

G. When specified, hangers and supports shall be stainless steel as specified in this Division.

H. Field welds, bolted connections, and abraded areas shall be cleaned and painted as specified herein.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF THIS SECTION 150010

SECTION 150020 - PIPING AND APPURTENANCES

PART 1 - GENERAL

1.1 Section Includes

A. The work specified herein includes furnishing and installing all piping, fittings, valves, and accessories required for a complete and satisfactorily working installation as shown and specified, except work specified in Section 150060.

1.2 Related Sections

A. Section 150000 - General Mechanical Provisions

B. Section 150010 - Basic Mechanical Materials and Methods

C. Section 150030 - Pumping Equipment

1.3 Submittals

A. Submit shop drawings and product data under provisions of Section 012000 - General Requirements.

B. Submit detailed drawings and data on pipe fittings, valves, and appurtenances and as specified under individual subsection.

C. Pipe and equipment manufactures' submittals as specified under individual subsection.

1.4 Delivery, Storage and Handling

A. Delivery, storage and handling shall be as specified under Section 012000 - General Requirements.

1.5 Guarantee

A. Provide guarantee under provisions of Section 012000 - General Requirements.

PART 2 - PRODUCTS

2.1 Water Piping

A. General

1. All piping shall be generally arranged and aligned as shown and specified. Where special conditions are encountered in the field, the arrangement and alignment of piping shall be as directed by the Engineer.
2. Piping shall be installed as directly as possible between connecting points insofar as the work of other trades permit. Where interference occurs with another trade whose work is more difficult to reroute, the Contractor shall revise the routing as required to avoid subject interferences. Piping shall be carefully installed to provide for proper alignment, slope and expansion.

3. To allow for expansion and contraction, pipe shall be guided and supported in such manner that pipelines shall not creep, sag or buckle. Anchors and supports shall be provided wherever necessary to prevent any misalignment of piping. Pipe support shall not be limited to support indicated on the drawings.
4. Small tubing to gauges, controls, or other equipment, installed on any apparatus shall not be coiled nor excessive in length but shall be installed neatly, carefully, bent at all changes in direction, secured in place and properly fastened to equipment at intervals to prevent sagging.
5. Prior to the start of any piping installation work, the Contractor shall prepare and submit for approval detailed piping installation drawings. These shall be prepared on the basis of actual equipment being furnished and actual dimensions of walls, openings and other significant elements.
6. Piping and appurtenances shall conform to applicable Section 1006, METALS, of the Standard Specifications.

B. Pipe and Fittings

1. Ductile Iron Pipe
   a) Ductile iron pipe shall be in accordance with ANSI / AWWA C115 / A21.15.
   b) Pipe of 8-inch through 20-inch diameter shall have a pressure rating of no less than 250 psig.
   c) All flanges for ductile iron pipe, except blind flanges, shall be of the threaded type meeting the requirements of ANSI / AWWA C115 / A21.15.
   d) Pipe shall be installed in maximum lengths of 10 feet.
2. Ductile Iron Fittings
   a) Ductile iron fittings shall have flanged joints as shown or specified. Fittings shall be provided as shown and specified and shall be ductile iron meeting the requirements of ANSI / AWWA C115 / A21.15.
   b) Ductile-Iron, Mechanical-Joint Piping:
   c) Ductile-Iron Pipe: AWWA C151/A21.51, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
   d) Ductile-Iron Fittings: AWWA C110/A21.10, mechanical-joint ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.
   e) Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

C. Flanged Connections

1. Flanged connections shall be made as shown and specified. All flanges shall be drilled in conformance with the 125/150 ANSI Standard template.
2. Class 150 pound steel flanges shall be smoothed finished (flat faced) for connection to dissimilar metals such as ductile iron.
3. Flanged joints shall be made with bolts or bolt studs with a nut on each end. Bolts, stud bolts, and nuts shall meet the requirements of ASTM A 307 Grade B and ASME B16.1. Bolts shall have a 1/4-inch projection beyond the nut when joint with gasket is assembled.

4. Rubber gaskets for flanged joints shall meet the requirements of AWWA C207 as modified and supplemented herein. Gaskets shall be 1/8-inch thick. Gaskets shall be full face.
5. Insulation (Dielectric): Provide insulated flanged joints as required. Provide flange insulation kits to include flange insulating gasket, flange bolt-insulating sleeves, and flange bolt insulating washers.

D. Temporary bulkheads

1. Temporary bulkheads shall be provided at the ends of pipeline sections where adjoining pipelines have not been completed and are not ready to connect. Temporary bulkheads shall be removed when they are no longer needed.

E. Submittals

1. All submittals, including the following, shall be provided as specified in Section 012000 - General Requirements with the following stipulations.
2. The following shop drawings shall be submitted.
   a) Flanged, screwed, welding and mechanical coupling fittings and pipe, couplings, harnessing and special fittings. When special designs or fittings are required, the Work shall be shown in large detail and the special or fitting shall be completely described and dimensioned.
   b) Fully Dimensioned layout of pipe, fittings, couplings, sleeves, supports, anchors, harnessing, valves and equipment. Pipe size, type and materials shall be labeled on drawing and a schedule shall be included.
   c) Cross sections showing elevation of pipe, fittings, sleeves, couplings, supports, anchors, harnessing, valves and equipment.
   d) Catalog data for pipe, couplings, harnessing and fittings.
3. The following certifications shall be submitted:
   a) Certificate of compliance for pipe, fittings, gaskets, couplings, sleeves, cleanouts, harnessing, specials, and coatings in accordance with this Division.
   b) Welders' certifications (if applicable).

F. Quality Assurance

1. Where applicable, certified welders, having current certificates conforming to the requirements of the ANSI code shall perform all welding on steel pipelines.

G. Painting and Coating

1. All ductile-iron pipe and fittings shall be shop coated on the outside with one coat of liquid epoxy primer, 4.0 mils minimum dry thickness, for use in epoxy locations, such as inside buildings, where finish painting or insulating is required.
2. Pipe for use not exposed to view shall be coated with the standard asphaltic outside coating specified in AWWA C151.
3. Immediately after facing and drilling, the back of the flanges and bolt holes shall be coated with asphaltic coating meeting the requirements of AWWA C151, Section 51-8.1.
4. The weight and class designation shall be conspicuously painted in white on the outside of each pipe, fitting, and special casting after the shop coat has hardened.

5. All pipes shall be painted in accordance with Sections 099113 and 099123.
6. Galvanizing: Provide galvanizing in accordance with ASTM A 53 where shown or specified.
7. Sleeve-type Couplings
   a) Couplings shall be shop coated with Dresser Industries Red D or Smith-Blair Standard Blue shop coat.
   b) An additional shop coat of Kop-Coat Hi-Guard epoxy or Tnemec Pota-pox shall be provided on the interior of the middle ring.
   c) The exterior of sleeve-type couplings shall be finish coated after installation with the same coating for the pipeline of which it is a part.
   d) Shop coats and finish coats shall be compatible.

2.2 Gas Piping

A. General

1. All piping shall be generally arranged and aligned as shown and specified. Where special conditions are encountered in the field, the arrangement and alignment of piping shall be as directed by the Engineer.
2. Piping shall be installed as directly as possible between connecting points insofar as the work of other trades permit. Where interference occurs with another trade whose work is more difficult to reroute, the Contractor shall revise the routing as required to avoid subject interferences. Piping shall be carefully installed to provide for proper alignment, slope and expansion.
3. To allow for expansion and contraction, pipe shall be guided and supported in such manner that pipelines shall not creep, sag or buckle. Anchors and supports shall be provided wherever necessary to prevent any misalignment of piping. Pipe support shall not be limited to support indicated on the drawings.
4. Small tubing to gauges, controls, or other equipment, installed on any apparatus shall not be coiled nor excessive in length but shall be installed neatly, carefully, bent at all changes in direction, secured in place and properly fastened to equipment at intervals to prevent sagging.
5. Prior to the start of any piping installation work, the Contractor shall prepare and submit for approval detailed piping installation drawings. These shall be prepared on the basis of actual equipment being furnished and actual dimensions of walls, openings and other significant elements.

B. Pipe and Fittings

1. Steel Pipe: ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.

   a) Malleable-Iron Threaded Fittings: ASME B16.3, Class 250, standard pattern.
   b) Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding.
   c) Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.

d) Forged-Steel Flanges and Flanged Fittings: ASME B16.5, minimum Class 150, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
   1. Material Group: 1.1.
   2. End Connections: Threaded or butt welding to match pipe.
   3. Lapped Face: Not permitted underground.
   4. Gasket Materials: ASME B16.20, metallic, flat, asbestos free, aluminum o-rings, and spiral-wound metal gaskets.
   5. Bolts and Nuts: ASME B18.2.1, carbon steel aboveground and stainless steel underground.

2. Fittings shall be flanged for piping within the pump station and mechanical joint for buried pipe.

C. Joining Materials

1. Joint Compound and Tape: Suitable for natural gas.
2. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
3. Brazing Filler Metals: Alloy with melting point greater than 1000 deg F (540 deg C) complying with AWS A5.8/A5.8M. Brazing alloys containing more than 0.05 percent phosphorus are prohibited.

D. Gas Valves and Fittings

1. Y-Pattern Strainers:
   a) Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
   b) End Connections: Threaded ends for NPS 2 (DN 50) and smaller; flanged ends for NPS 2-1/2 (DN 65) and larger.
   c) Strainer Screen: 40-mesh startup strainer and perforated stainless-steel basket with 50 percent free area.
   d) CWP Rating: 125 psig (862 kPa).
2. General Requirements for Manual Gas Shutoff Valves, NPS 2 (DN 50) and Smaller: Comply with ASME B16.33.
   a) CWP Rating: 125 psig (862 kPa) at the end of the line.
   b) Threaded Ends: Comply with ASME B1.20.1.
   c) Dryseal Threads on Flare Ends: Comply with ASME B1.20.3.
   d) Tamperproof Feature: Locking feature. Listing: Listed and labeled by an Nationally Recognized Testing Lab (NRTL) acceptable to authorities having jurisdiction for gas service for valves 1 inch (25 mm) and smaller.
   e) Service Mark: Valves 1-1/4 inches (32 mm) to NPS 2 (DN 50) shall have initials "WOG" permanently marked on valve body.
3. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim: MSS SP-110.
   a) Body: Bronze, complying with ASTM B 584.
   b) Ball: Chrome-plated bronze.
   c) Stem: Bronze; blowout proof.
   d) Seats: Reinforced TFE; blowout proof.
   e) Packing: Threaded-body pack nut design with adjustable-stem packing.
   f) Ends: Threaded, flared, or socket. CWP Rating: 600 psig (4140 kPa).

g) Listing: Valves NPS 1 (DN 25) and smaller shall be listed and labeled for gas service by an NRTL acceptable to authorities having jurisdiction.
h) Service: Suitable for natural-gas service with "WOG" indicated on valve body.

4. Dielectric Fittings
   a) General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
   b) Dielectric Unions:
      1. Description:
         a. Standard: ASSE 1079.
         b. Pressure Rating: 125 psig (860 kPa) minimum at 180 deg F (82 deg C).
         c. End Connections: Solder-joint copper alloy and threaded ferrous.
   c) Dielectric Flanges:
      1. Description:
         a. Standard: ASSE 1079.
         b. Factory-fabricated, bolted, companion-flange assembly.
         c. Pressure Rating: 125 psig (860 kPa) minimum at 180 deg F (82 deg C).
         d. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
   d) Dielectric-Flange Insulating Kits:
      1. Description:
         a. Nonconducting materials for field assembly of companion flanges.
         b. Pressure Rating: 150 psig (1035 kPa).
         c. Gasket: Neoprene or phenolic.
         d. Bolt Sleeves: Phenolic or polyethylene.
         e. Washers: Phenolic with steel backing washers.

E. Pressure Regulator

1. General Requirements:
   a) Single stage and suitable for natural gas.
   b) Steel jacket and corrosion-resistant components.
   c) Elevation compensator.
   d) End Connections: Threaded for regulators NPS 2 (DN 50) and smaller; flanged for regulators NPS 2-1/2 (DN 65) and larger.
2. Line Pressure Regulators: Comply with ANSI Z21.80.
   a) Body and Diaphragm Case: Cast iron or die-cast aluminum.
   b) Springs: Zinc-plated steel; interchangeable.
   c) Diaphragm Plate: Zinc-plated steel.
   d) Seat Disc: Nitrile rubber resistant to gas impurities, abrasion, and deformation at the valve port.
   e) Orifice: Aluminum; interchangeable.
   f) Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.
   g) Single-port, self-contained regulator with orifice no larger than required at maximum pressure inlet, and no pressure sensing piping external to the regulator.
   h) Pressure regulator shall maintain discharge pressure setting downstream, and not exceed 150 percent of design discharge pressure at shutoff.
   i) Overpressure Protection Device: Factory mounted on pressure regulator.

j) Atmospheric Vent: Factory- or field-installed, stainless-steel screen in opening if not connected to vent piping.
k) Inlet Pressure: 2 psig; Coordinate required highest outlet pressure with generator manufacturer.

F. Submittals

1. Coordination Drawings: Plans and details, drawn to scale, on which natural-gas piping is shown and coordinated with other installations, using input from installers of the items involved.
2. Site Survey: Plans, drawn to scale, on which natural-gas piping is shown and coordinated with other services and utilities.
3. Qualification Data: For qualified professional engineer.
4. Welding certificates.
5. Field quality-control reports.

G. Quality Assurance

1. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
2. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Test, inspect, and purge natural gas according to NFPA 54 and authorities having jurisdiction.

H. Painting and Coating

1. Paint exposed, exterior metal piping, valves, service regulators, service meters and meter bars, earthquake valves, and piping specialties, except components, with factory-applied paint or protective coating.
   a) Latex Over Alkyd Primer System:.
      1. Prime Coat: Alkyd anticorrosive metal primer.
      2. Intermediate Coat: Interior latex matching topcoat.
      3. Topcoat: Interior latex flat.
      4. Color: Gray.

2.3 Valves

A. General

1. This section includes requirements for furnishing and installing all valves.

B. Quality Assurance

1. All valves of the same type shall be furnished from the same Manufacturer insofar as possible. Parts shall be interchangeable for all valves of the same type and size.

C. Submittals

1. The following Shop Drawings shall be submitted:
   a) Complete detailed drawings of all valves.
   b) Working drawings, including arrangement and erection drawings of the operators

2. The following quality control submittals shall be submitted: Manufacturer's certified performance and material records.
3. Operation and maintenance manuals shall be submitted for the valve operators.

D. Construction

1. Valves shall be fabricated of materials resistant to corrosion for the required service.
2. Operator housings and pedestal handwheels:
   a) Cast iron ASTM A 126, Class B
   b) ASTM A 48, Class 30 or 35
   c) Ductile iron ASTM A 395
   d) ASTM A 536, Grade 65-45-12
   e) Cast steel ASTM A 27
3. Operator worms, steel ASTM A 29 Grade Designation 8620
4. Operator gears, steel (spur & helical) ASTM A 441
5. Worm gears, bronze ASTM B 148, Alloy C95400 or C95500 ASTM B 584, Alloy C86300
6. Valve Joints
   a) All valves shall have flanged ends, unless otherwise specified.
   b) Metallic flanged joints shall be faced accurately at right angles to the axis of the casting. Face and drill flanges and shop coat with a rust-preventive compound before shipment.
   c) Dimensions and drillings of flanges shall meet the requirements of ANSI B16.1, 862 kPa (125 pounds) as a minimum.

E. Duckbill Valves

1. Slip on "Duckbill" style check valves:
   a) The valve shall be an elastomeric "duckbill" type check valve. The valve shall be a one-piece, fabric-reinforced elastomer matrix, with flanged end. The valve shall have a 100% full round opening on the inlet, and shall taper down to a flattened duckbill on the other end, designed to allow flow in the forward direction and block flow in the reverse direction. The valve shall be equipped with stainless steel slip-on retaining rings.
   b) Valves shall be manufactured in the USA.
   c) When upstream pressure exceeds downstream pressure, the valve shall start opening, allowing flow through the valve. When down-stream pressure is greater than upstream pressure, the valve shall close, blocking flow.
   d) Valves shall meet the requirements as described above and shall be manufactured by:
      1) Onyx Valve Company
      2) Cal Valve
      3) Tideflex
      4) Or approved equal
   e) Valve shall be stored and installed as per manufacturer's Instruction and Operation Manual.

PART 3 - EXECUTION

3.1 Transportation and Delivery

A. Every precaution shall be taken to prevent injury to the pipe during transportation and delivery to the site. Extreme care shall be taken in loading and unloading the pipe and fittings. Such Work shall be done slowly with skids or suitable power equipment, and the pipe shall be under perfect control at all times. Under no condition shall the pipe be dropped, bumped, dragged, pushed, or moved in any way that will cause damage to the pipe or coating. When handling the pipe with a crane, a suitable pipe hook or sling around the pipe shall be used. Under no condition shall the sling be allowed to pass through the pipe unless adequate measures are taken to prevent damage to the pipe ends.

B. If any pipe or special is damaged in the process of transportation, handling or laying, such pipe or pipes shall be replaced or repaired by the Contractor at its own expense.

C. The Contractor shall furnish and install suitable blocking and stakes to prevent the pipe from rolling. The type of blocking and stakes, and the method of installation, shall be approved by the Engineer.

3.2 Piping Installation General

A. The dimensions shown on the Drawings for the location of pipelines have been established with the intent that there will be no interferences. The Contractor shall check all dimensions shown on the Contract Drawings prior to the installation of Work and shall notify the Engineer promptly of any interferences or errors discovered. If interferences are found to exist prior to or during construction, changes in the location of pipelines to avoid such interferences shall be made at no extra cost to the Owner and in a manner as reviewed by the Engineer.

B. Elevations and dimensions locating pipelines are shown on the Drawings

C. Piping connections and dimensions to equipment are subject to changes as reviewed by the Engineer to suit the types of equipment furnished.

D. Piping suspended from ceilings shall be installed to provide maximum headroom consistent with good installation.

E. The layout of the piping and fittings shall be carefully checked to determine that the related equipment can be properly assembled to produce a workable arrangement. Defective or improperly fabricated Work shall be rejected and replaced with Work which, when completely assembled, shall result in an arrangement which shall function as intended and as shown on the Drawings.

F. All pipelines shall be straight and true in alignment, grade and location indicated, designated or required, and all installation shall be made in a workmanlike manner to the satisfaction of the Engineer. The pipe and fittings shall be adequately braced and blocked or tied, hung or supported for satisfactory installation.

G. As soon as pipes are in place, all open ends shall be capped until permanent connections are made. All pipelines shall be securely supported when required either by hanging from beams with suitable pipe hangers or supported on walls by suitable wall brackets. Where it is necessary, install hangers or supports after concrete is poured or other masonry Work finished. Anchor bolts with expansion shields shall be used.

H. Where pipes pass through masonry walls, floors and partitions, the juncture shall be made as shown on Plans. Where no details are shown, the Contractor shall either rough in the piping before the concrete is poured or the masonry completed, or shall provide suitable plugs, sleeves or forms for piping. After the pipes have been installed, the openings shall be filled solid; suitable allowance being made, however, for the expansion and contraction of the piping. The cutting of concrete for pipe shall be avoided wherever possible, and in no case where such cutting is necessary shall reinforcing rods be cut or disturbed, and no such cutting shall be done without the permission of the Engineer. All openings made for pipe Work shall be neatly patched in a workmanlike manner.

I. Horizontal runs shall be given as steep a pitch with even grade toward the outlet as conditions will permit, and care shall be taken in laying out piping that there is no interference with the proper location of piping for other purposes or other equipment. No change shall be made in the general location shown for piping, or in the method of running and connecting same, except with the written approval of the Engineer. When any change is made, the Contractor shall keep a record of the location of all pipes so changed and a copy of such record shall be given to the Engineer showing the location of all piping.

J. Install dielectric fitting between dissimilar pipe materials as required.

3.3 Outdoor Piping Installation

A. Comply with NFPA 54 for installation and purging of natural-gas piping.

B. Steel Piping with Protective Coating:

1. Apply joint cover kits to pipe after joining to cover, seal, and protect joints.
2. Repair damage to PE coating on pipe as recommended in writing by protective coating manufacturer.
3. Replace pipe having damaged PE coating with new pipe.

C. Install fittings for changes in direction and branch connections.

D. Install pressure gage upstream and downstream from each service regulator.

3.4 Valve Installation

A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing, aluminum, or copper connector.

B. Install underground valves with valve boxes.

C. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.

3.5 Protection of Piping System

A. Install and maintain pipe and equipment that is clean and free from rust, dirt, scale, etc.

B. Install temporary airtight covers at all pipe and equipment openings. Special attention shall be given to vacuum and air piping and each pipe section shall be individually inspected prior to placing. No piping shall be placed when wet, nor shall any free moisture be present inside any air piping during installation.

3.6 Pipe Supports and Hangers

A. Pipe supports and hangers shall be in accordance with Section 150010.

3.7 Welding

A. All welding of piping and/or special fittings shall be done in conformity with the current ANSI B31.1, "Pressure Piping". A certification of the welder's qualifications, in conformity with the requirements of this code, shall be submitted to the Engineer.

B. Tee connections in welded piping shall be made with a factory fabricated butt-welding tee or with weld-o-let of butt, socket or threaded type. When weld-o-lets are used, the branch connection shall be one-half the diameter of the main or less. Scarf welding or direct butt welding of side connections shall not be permitted. Tees fabricated from pipe shall not be permitted.

C. Long radius welding elbows shall, whenever possible, be used for changing direction of welded pipelines. Mitered joints shall be subject to approval by the Engineer.

3.8 Flanged Joints

A. All flanged joints shall be made temporarily with gaskets in place using a minimum number of bolts to support the piping. Any misalignment of the assembled piping shall be adjusted or corrected in a manner approved by the Engineer.

B. Tightening of flange bolts to "pull up" misaligned flanges will not be permitted and shall not be done. The misaligned flanges shall be machined to fit, or approved spacer pieces and gaskets shall be installed if necessary and directed by the Engineer. The temporary assembly of the flanged piping shall demonstrate that there will be no undue stresses in the piping or at the connections to the equipment. The Engineer shall approve the temporary assembly before the joints are tightened. Flanged joints shall then be completed and made watertight and the tension in the flange bolts, when tightened shall not exceed 103.4 MPa (15,000 psi) at the minor diameter of the bolt threads.

3.9 Sleeve Type Couplings

A. For sleeve type couplings, diametrically opposite bolts shall be equally tightened on the connection so that the gaskets will be brought up evenly all around the pipe. Final tightening shall be done with torque wrenches set for the torque recommended by the coupling manufacturer.

3.10 Testing

A. Where applicable, pipes shall be flushed clean and tested and any leaks shall be made tight.

3.11 Supports for Present Piping

A. Wherever Contractor is required to expose, suspend or reroute present piping, supports for such piping shall be provided as is required for new piping in accordance with paragraph 3.04 Pipe Supports, this Section.

3.12 Wrecking and Repair

A. The Contractor shall do its own excavation for piping as required to complete the Work. If excavation is required below present concrete slabs, the backfill materials shall be sand flushed in place or class B concrete fill as required by the Engineer. The concrete used to repair the structure shall be Class concrete. Where reinforcing is cut, dowels shall be used for laps. Junctures between the present portions of slabs remaining and new slabs shall be uniformly saw cut.

3.13 Installation of pipe and fittings

A. All pipe and fittings shall be installed in accordance with the specifications contained herein and in Sections 150000 and 150010 and in accordance with the manufacturer's recommendations and approved shop drawings and as specified herein.

END OF THIS SECTION 150020

SECTION 150030 - PUMPING EQUIPMENT

PART 1 - GENERAL

1.1 Description

A. This section includes requirements for furnishing and installing submersible pumping units with all appurtenances necessary for a complete installation.

B. Pumping units include three (3) main pumps and one (1) low flow pump as shown on the Drawings and specified.

C. Pumps shall be of the vertical, centrifugal, heavy duty, non-clog, close-coupled, submersible type, with bottom suction and side discharge, driven by submersible electric motor mounted as an integral part of the pump. The pumping units shall be designed to pump at the capacities specified. The pumps shall be provided with guide cable, removal cable, and electric cable with plug connectors and base elbow. The pumps and appurtenances shall be arranged for installation in the space shown without appreciable revision of the piping. The pumping units shall be designed for continuous or intermittent duty.

D. Unless otherwise indicated, all pumps of a specified type shall be identical, the product of the same manufacturer. Refer to Section 150000, 1.9 Materials and Equipment.

1.2 Pumps

A. The main pumps shall be capable of a draw down to a low water elevation shown on plans without cavitation occurring. Manufacturer's certification of the proceeding shall be provided as part of the submittal data.

B. The low flow pump shall be capable of a draw down to a low water elevation as shown on plans without cavitation occurring. Manufacturer's certification of the proceeding shall be provided as part of the submittal data.

C. The main and low flow pumps shall operate at the capacities and heads and over the range of operating conditions specified without overloading, cavitation, and vibration. The pumps shall conform to the requirements shown on the contract drawings and contained herein.

	Requirements	
Items	Main Pumps	Low Flow Pump
Capacity at rating point (design point)	See drawings	
Developed head at rating point (design point)	See drawings	
Overall efficiency, wire to water, at rating point, minimum, percent	60	60
Secondary Capacity at minimum static head, GPM	6154	1336
Head at minimum static head, feet	12.1	23
Overall efficiency at minimum static head, percent	53	72
Diameter of sphere that will pass through the pump, minimum	2.5 inch	2.5 inch
Pump Discharge Diameter	See drawings	
Pump speed, maximum, rpm	See drawings	
Motor horsepower, minimum	See drawings	
Motor efficiency at full load (%)	87	87
Motor power factor at full load, Minimum	0.8	0.8
Motor service factor	1.15	1.15
Locked rotor kVA/hp, maximum	5.59	5.59
NEMA code letter	F	F

D. Each pump shall have a continuously rising characteristic curve from the rating point to shutoff which passes through the rating point, and which meets or exceeds the specified heads and capacities, all within the Hydraulic Institute tolerances.

E. Submersible units shall be capable of sustaining full reverse runaway speed without damage.

F. Motors shall be capable of operating pumps at any point on the curve without overloading and without using the service factor

G. Electrical Service and motor circuit feeders have been designed based on the minimum efficiencies and power factors shown above. If power factor of the selected pumping equipment is less than the power factor shown above, coordinate with the electrical contractor and provide power factor correction capacitors to meet the minimum requirements at no additional cost to the Owner.

1.3 Related Sections

A. IDOT Standard Specifications – for Cast-In-Place Concrete

B. Section 055000 - Metal Fabrications

C. Section 150000 - General Mechanical Provisions

D. Section 150010 - Basic Mechanical Materials and Methods

E. Section 150020 - Piping and Appurtenances

F. Section 160020 - Major Electrical Equipment

G. Section 160030 - Packaged Engine Generator System

1.4 Submittals

A. All submittals, including the following, shall be provided as specified in Section 012000 - General Requirements.

B. Submit a list of not less than five (5) installations where pumping equipment of the type and approximate size specified herein have been in successful operation for at least five (5) years.

C. Submit location of the nearest permanent service headquarters of the pump and motor manufacturers.

D. Submittal data shall include:

1. Complete manufacturer's specifications and descriptive bulletins for all equipment including size, capacity, description and make of pumps.
2. Complete description, illustrations, and wiring diagrams of automatic controls and starting equipment.
3. Complete motor data, as specified.

4. Pump performance curves for the specified conditions including head, input kilowatts, and overall efficiency, as a function of capacity from zero to maximum capacity.
5. Drawings of the equipment, including arrangement and erection drawings of the equipment and equipment operating characteristics in such detail as to give all dimensions necessary to accurately locate through the floors and walls all openings for pipes, anchor bolts and fittings for motors, pumps, motor and pump control center openings, and conduit between the associated equipment. This includes drawings, indents, pockets, and clearances necessary in the floors and walls for proper installation of the equipment specified.
6. Provide pump support requirements including intermediate supports and maintenance access space.
7. General arrangement drawing of pumping unit, base elbow and guide rail system. Include equipment weight and anchor methods and materials.
8. Cross-section drawing of pumping unit.
9. Parts list with materials of construction identified.
10. Motor performance characteristics.
11. Spare parts list.
12. Painting procedure.
13. Six certified copies of the Shop Test results.

E. Submit copies of all manufacturers' guarantees and warranties obtained by the contractor to be transferred to the State of Illinois, Division of Highways, at the time of acceptance of this project by the State of Illinois.

F. Motor data shall include:

1. Manufacturer
2. Nameplate rated kilowatts (horsepower)
3. Rated voltage
4. Full load rpm
5. Full load current
6. Full load power factor
7. NEMA design letter
8. NEC code letter or inrush current
9. Insulation class
10. Service factor
11. Recommended starting restrictions, including allowable starts per hour
12. Recommended maximum KVAR rating of power factor correction capacitors.

1.5 Quality Assurance

A. Pumping Equipment

1. Pumping equipment shall be produced by a manufacturer who regularly engages in the design, manufacture, assembly and production of submersible sewage pumping equipment of the size and type as specified for not less than five years.

2. Motor units and wet well wiring shall be rated for service in hazardous Class I, Division 2, Group D locations.
3. All materials used in the construction of the equipment herein specified shall be new and of the highest available grade and of properties best suited to the Work required.
4. One manufacturer shall be responsible for providing pumping equipment, including pump motor and all accessories.
5. Unless otherwise indicated, all pumps of a specified type under this Section shall be identical, the product of the same manufacturer.
6. To ensure that all equipment is properly coordinated and will function in accordance with the intent of these Specifications, the Contractor shall obtain all the equipment specified herein from the pump manufacturer in whom shall be vested unit responsibility for the proper function of the complete system, including pumps, motors, electrical, control equipment and accessories as shown and specified. Contractor, however, shall retain overall responsibility for equipment coordination, installation, testing and operation.

B. Contractor's Responsibility

1. If the power demand of pumping units proposed to be provided for this Project exceeds the minimum horse power as specified and shown in the Drawings, it is the Contractor's sole responsibility, without additional cost to the Owner, to upgrade all affected electrical facilities such as, but not limited to, wiring, conduits, motor controls, switchgear, transformers and incoming facilities to be able to operate all the pumping units satisfactorily and to meet the Specifications.

C. Manufacturer's Certifications

1. Submit manufacturer's certification that he has carefully examined all of the Contract Documents in detail, including the arrangement and conditions of proposed structures affecting the performance of the pumping equipment units, and the detailed requirements of manufacturing and subsequent installation of the pumping equipment units.
2. Submit manufacturer's certification that there are no omissions, ambiguities or conflicts in the Contract Documents or in the pumping station piping layout that affect the pumping units, as shown on the Drawings which have not already been clarified in writing by the Owner.
3. Submit manufacturer's certification that they have reviewed the location and discharge piping design, the discharge valve locations and types, the loads imposed on the pumping units from the connections, the pumping unit locations such as the physical separation to each other and adjacent walls, the water to be pumped, adequacy of feeder and starter sizes, electrical service capacity and control schemes, and pumping station piping layout, as shown on the Drawings, and that any incidental modifications thereto will not affect the specified pumping unit performance and efficiency to be furnished under this Contract, and they will be solely responsible for furnishing and delivering pumping equipment that will perform and meet the requirements, as specified in the Contract Documents.

4. Submit manufacturer's certification that they have inspected the storage of the pumping equipment and find no conditions that have adversely affected the equipment.
5. Submit manufacturer's certification that they have supervised the installation of the pumping equipment and that the pumping equipment has been properly installed.
6. Submit manufacturer's certification that they have inspected the pumping equipment after 1000 hours of operation and certify the pumping equipment is operating satisfactorily.
7. Submit certification that the equipment is compliant with Article 106.01 of IDOT Standard Specifications requiring iron and steel materials be produced and fabricated domestically.

D. Data to be Filed with the Engineer

1. Record Drawings: The Contractor shall keep one record copy of all Specifications, Plans, Addenda, Supplementary Drawings, Working Drawings, Change Orders and Clarifications at the site in good order. Specifications, Plans, Supplementary Drawings and Working Drawings shall be annotated to show all changes made during the construction process. These shall be available to the Owner at all times and shall be delivered to the Owner upon completion of the work.
2. Four bound copies of operating and maintenance instructions, diagrams, parts, lists, requirements and other information pertinent to the operation of the various systems and equipment shall be furnished to the Owner.

E. Source Quality Control

1. Shop tests shall be performed on each pumping unit, including spare pumps, in accordance with the test code of the Hydraulic Institute, except as modified herein. The pumps shall be tested in the position that they will be installed.
2. Tests shall be conducted at rated speed to determine the curves of head, electric input kilowatts, and overall efficiency, wire to water, as a function of capacity. A minimum of six points shall be taken, including shutoff. One point shall be as near as possible to each specified condition of head and capacity and the remaining points at capacities necessary to provide a uniform distribution of data. Capacity shall be expressed in liters per second (gallons per minute) and head shall be expressed in feet. Raw test data, calculated results and sufficient information for computation and plotting of the curves shall be furnished with the certified shop test curves.
3. Certified test curves shall be furnished for approval prior to shipment. All tests shall be witnessed by the manufacturer by a Registered Professional Engineer registered in the state in which the shop tests are performed. The witnessing Registered Professional Engineer shall sign and seal each copy of the curve and test data sheets. Six copies of the curves along with the certified drive unit test data shall be furnished for approval. Shipment of the pumping units shall not be made until the test data and curves are approved.

4. Curves shall be drawn to such scale that values can be read accurately within 1%. The efficiency curves submitted shall constitute a guarantee within 1% on the scale, for all deliveries between 3/4 rated capacity and 1-1/4 rated capacity.
5. In addition to the hydraulic test, the pump manufacturer shall perform the following inspections and tests on each pump before shipment from factory:
   a) Impeller, motor rating and electrical connections shall first be checked for compliance with the Specifications.
   b) A motor and cable insulation test for moisture content or insulation defects shall be made.
   c) Prior to submergence, the pump shall be run dry to establish correct rotation and mechanical integrity.
   d) The pump shall be run for 30 minutes submerged a minimum of 1.83 m (6 ft.) under water.
   e) After operational test 1.5.5(e) 4 the insulation test 1.5.4(e) 2, is to be performed again. A written report, stating the foregoing steps have been done, shall be submitted prior to shipment.
   f) The low flow pump shall be subjected to a hydrostatic test and certification of the hydrostatic test shall be provided. The hydrostatic pressure shall, in any case, not be less than twice the shut-off pressure of the pump as shown by the characteristic curve.
6. The Contractor shall provide transportation and reasonable expenses to and from all factory pump testing for two (2) representatives of the State of Illinois to witness such testing. State of Illinois shall designate these individuals. The Contractor shall notify the State of Illinois of a scheduled test date two months prior to said date and shall arrange an exact suitable date not less than two weeks prior to the test.
7. The pump tests shall be performed in the domestic United States. However, if this can't be done, the contractor shall hire an approved witness and pay all necessary expenses if the tests cannot be performed in the domestic United States.

1.6 Guarantee

A. All mechanical equipment shall be guaranteed from all defects of material and workmanship for the manufacturer's standard length of guarantee or for 1 year from the date of final acceptance, whichever is longer.

1.7 Delivery, Storage and Handling

A. Products and materials shall be delivered, stored and handled as specified in Section 012000 - General Requirements.

1.8 Spare Parts

A. The following spare parts shall be provided. Two sets shall be provided for the main pump and one set for the low flow pump for each pump:

1. One set of mechanical seals
2. One set of cable entry grommets
3. One set of Motor Bearings
4. One set of Wear Rings

B. A complete set of special wrenches, spanners, eyebolts and other special tools shall be furnished sufficient to completely dismantle and reassemble each kind and size of pumping unit. Tools shall be forged steel, case hardened, full finished, and furnished with a metal tool case with a handle and provision for padlocking.

C. The spare parts and equipment shall not be delivered to the site until the project is ready for final inspection. The spare parts shall be securely packed for extended storage and provided with a complete list of parts. Each part shall be clearly identified and coordinated with the list.

PART 2 - PRODUCTS

2.1 Pump Specifics

A. Specifics Applicable to Main and Low Flow Pumps

1. Casing
   a) Pump casing shall be ASTM A48, cast iron, with smooth surfaces devoid of blowholes or other casting irregularities. All exposed nuts or bolts shall be type 304 stainless steel.
   b) Wear Rings shall be nitrile rubber coated stainless steel renewable wear rings.
2. Impellers
   a) Pump impellers shall be cast iron ASTM A48 Class 35B with 25% Chromium and shall be statically and dynamically balanced, non-clogging, designed with minimum clearances so as to preclude solids and stringy material from damaging the mechanical seal, on the back of the impeller.
   b) The impeller shall be secured to the shaft with a stainless steel key and lock nut in such a way that it cannot unscrew or become loosened due to rotation in either direction.
   c) Each pump shall be equipped with a stainless steel renewable impeller wear ring.
3. Mechanical Seal
   a) Pumps shall have double or tandem mechanical seals.
4. Motor
   a) Submersible pump motors shall be of 460-volt, 3-phase, 60-hertz squirrel cage induction type NEMA Design B suitable for operation in NEC Class I, Division 2, Group C and D hazardous areas as determined and approved by a U.S. nationally recognized testing agency (U.L, FM).
   b) Motors shall have suitable output torque and speed characteristic to start and operate the pump over the range of specified conditions. Nameplate horsepower rating shall not be exceeded under maximum load conditions for constant speed pumping units. The motors shall be for continuous load operation, specifically designed for submersible pump usage, and shall be capable of sustaining continuous on-off cycling of fifteen starts per hour minimum without exceeding the 80 degree C temperature rise.

c) The stator windings and stator leads shall have a minimum of NEMA Class F (155 degrees C) moisture resistant insulation. The stator coils shall be dipped and baked in Class F varnish and shall be heat-shrink fitted into the stator housing. Impregnation resin shall be applied to stator assembly in three dip and bake steps.

d) Motors shall have ASTM A48 cast iron stator housing. For motors that employ cooling water jackets, the water jacket passages shall preclude clogging by solids contained in the pumped liquid.

e) The motor cables shall be multi-conductor flexible cables designed specifically for use with submersible pumps and shall be of stranded, tinned copper conductors with 600V ethylene-propylene insulation, cabled with non-hygroscopic vulcanized rubber fillers and binder tape, covered with water & oil resistant chloroprene rubber jacket, rated 90^{O} C in 40^{O} C ambient.

f) Separate cables shall be provided for power and control. For application in Class I, Division 2 locations multiple power cables shall be used to limit conductor current. The power and control cables shall have sufficient length to reach the termination boxes as shown on Plans without splices.

g) Motor cable entries shall have a mechanical locking ring or compression type cord grip to protect the cable jacket from being pulled out of the motor. Do not use epoxy for this purpose. Cable entries shall have watertight seals. Cable entry leads shall be isolated from the internal motor leads to prevent entry of water into the motor chamber by leakage or wicking. One cable for power and one cable for controls shall be provided. Cables shall be suitable for submersible pump application and shall conform to NEC specifications for cable sizing.

h) The motor shall be designed for operating under completely submerged or unsubmerged conditions without damage while pumping under load.

i) The combined service factor (combined effect of voltage, frequency and specific gravity) shall not be less than 1.15.

j) The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 19.5 m (65 feet).

k) The rated motor horsepower shall not be less than the brake horse power of the pump throughout the entire pump performance curve from shut-off through run-out.

5. Shaft

a) Shafts shall be one piece, fully machined pump and motor shafts. Maximum shaft deflection under maximum pumping load to shall be .002 inches at the lower mechanical seal face.

b) Shafts shall be carbon steel or stainless steel material and adequately designed to meet the maximum torque required at any start-up condition or operating point in the system. Carbon steel shafts shall be protected from exposure to the pumped liquid by a stainless steel sleeve, carbon steel sleeve or chrome plating.

6. Bearings
   a) The pump shaft shall rotate on permanently lubricated bearings. One assembly shall carry only radial loads and be free to float axially within the frame. The other assembly shall carry both radial and axial loads and be restrained from axial movement.
   b) Bearings shall be of sufficient size and properly spaced to transfer all radial and axial loads to the pump housing and minimize deflection
   c) Bearings shall conform to ANSI B3.15 and B3.16, Load Ratings and Fatigue Life for Ball and Roller Bearings, and the minimum L10 bearing life shall be 100,000 hours at the maximum pumping load that occurs under the specified operating conditions.
7. Protection Monitoring System
   a) Each pumping unit shall be equipped with a monitoring system to protect critical machine functions during operation.
   b) Three motor temperature RTDs, one per phase, one bearing temperature RTD shall be provided in the main pumps to protect against overheating by initiating an alarm on high temperature.
   c) A moisture sensor shall be provided to protect against damage from water contamination. The sensor shall be arranged to initiate the alarm upon sensing moisture in the oil chamber or prior to water reaching the motor windings.
   d) A monitoring device or devices designed to be compatible with the sensors and motor controls shall be provided. The monitoring devices shall be located in the motor control center. The monitoring system shall be intrinsically safe. The monitoring of the low flow pump shall include thermal switches for over temperature detection of each phase winding of the motor. The pump supplier shall coordinate with the Electrical Contractor for installing the pump monitoring units in the respective pump buckets. The monitoring units shall be installed in the MCC buckets and their displays and indications shall be installed on the covers of the respective MCC buckets.
   e) The display unit for the main pumps shall include a keypad for scrolling through its menu. It shall display pump serial number, motor winding and bearing temperatures, status of the leakage detector, and alarm conditions, if any. The display unit for the low flow pump shall have LED status indications for power, over temperature and leakage.

      The reset function for both main pump and low flow pump monitoring units shall be automatic after the alarm condition is cleared for both over temperature and a leakage conditions. The units shall also automatically reset after the power is restored following a power outage.
8. Cable Holder
   a) Each pump shall be fitted with a stainless steel cable of adequate length and strength to permit the raising and lowering of the pump for inspection and removal.

b) Provide all stainless steel cable support grips, cable pull line, snap hook and anchor as required or as shown on the drawing.

B. Specifics Applicable to Pumps

1. Design
   a) Pumps shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars or cable system extending from the station floor to the discharge connection.
   b) Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable.
   c) Casing
      1) Pump casing shall be of the centerline discharge type.
   d) Solids Flushing
      1) A means of flushing solids into suspension at pump start up using the pumped liquid shall be provided. A means of adjustment shall be provided to set the flushing period. Applicable data and drawings shall be submitted for approval.

C. Approved Pump Manufacturers

Flygt, a division of Xylem Corporation; Yeomans Chicago Corporation; and Ebara Fluid Handling.

2.2 Operation and Control

A. Pump controls shall be provided in accordance with Division 16.

B. Pumps shall function in rising water and in falling water as shown on the drawings.

C. Float Level Detectors

1. The float level detecting devices shall be located in the wet wells shown and as specified in Section 160020. One float shall be utilized for each control level.

2.3 Bolts, Studs and Nuts

A. All bolts, studs and nuts shall have American National form right-hand machine cut threads which shall be in conformity with the current ANSI B1.1, "Screw Threads", Coarse Thread Series, class 2 Fit, unless otherwise specified.

B. Bolts heads and nuts shall be semi-finished and shall be in conformity with ANSI B18.2, "Wrench-Head Bolts and Nuts and Wrench Openings", Heavy Series, unless otherwise specified. All nuts shall be hexagonal in shape.

C. Stainless steel anchor bolts, flange bolts, studs and nuts shall be in conformity with the current ASTM Designation: A193, Grade B8 (AISI 304), Class 1 and ASTM A194, Grade 8 (AISI 304), AISI 316 or approved equal.

PART 3 - EXECUTION

3.1 General

A. All equipment shall be installed in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Sections 012000 and 150000. The manufacturer shall inspect the pump installation and shall certify that the pumps have been installed properly. Information submitted for approval shall include a letter of intent to provide this certification. All wiring and piping shall be completed and all necessary adjustments to equipment shall be made to provide a complete operational pumping installation.

B. The manufacturer shall have joint responsibility with the Contractor for the proper installation of the equipment, and jointly with the Contractor shall furnish a written statement to the Owner certifying that the equipment as installed complies with the Plans and Specifications, will perform as specified, and is properly installed.

3.2 Field Quality Control

A. Representative of the Manufacturer

1. The services of a qualified representative of the manufacturer shall be provided to instruct on proper installation of the equipment, inspect the completed installation, make any necessary adjustments, participate in the startup of the equipment, participate in the field testing of the equipment, place the equipment in trouble-free operation, and instruct operating personnel in its operation and maintenance.

B. Installed Testing

1. After installation of the pumping units, control equipment and all appurtenances, each unit shall be subjected to a field running test under actual operating conditions. Water for these tests will be made available by the Village of Meredosia at no charge to the Contractor from a nearby fire hydrant. The Contractor shall be the responsible for coordination with the Village and for any hoses and connections needed to transport water from fire hydrant to the pump station. Field tests shall be performed in the presence of and as directed by the Engineer. Tests shall demonstrate that under all conditions of operation each unit:
   a) Has not been damaged during transportation or installation.
   b) Has been properly installed.
   c) Has no physical or mechanical defect.
   d) Has been properly connected.
   e) Is free of overheating of any parts.
   f) Is free of overloading of any parts.
2. The pumps shall be tested to demonstrate that the pumps and control system operate as specified. Any defects in the equipment or failure to meet the requirements of the Specifications shall be promptly corrected.

3. The following shall be checked on start-up:
   a) Current draw and voltage on all legs of each pump shall be observed and recorded to see if there is any imbalance.
   b) Megger testing shall be performed and logged on all pumps.
   c) Pump controls and terminations shall be checked.
   d) At a minimum, each pump, including all spare pumps, shall be run in recirculation a minimum of 5 minutes.

3.3 Schedule
A. Refer to Drawings.

END OF THIS SECTION 150030

DIVISION 150040 - VENTILATION

PART 1 - GENERAL

1.1 Section Includes:
A. The work specified herein includes furnishing and installing the ventilating system including fans, louvers, dampers, ductwork, supports, air inlets and outlets and all associated appurtenances and work as indicated on drawings and as specified herein.

1.2 Related Sections:
A. Section 042000 - Unit Masonry

B. Section 055000 – Metal Fabrications

C. Section 150000 - General Mechanical Provisions

D. Section 150010 - Basic Mechanical Materials and Methods

E. Section 160000 - General Electrical Provisions

F. Section 160010 - Basic Electrical Materials and Methods

1.3 References: All reference standards shall be from the latest edition.
A. AMCA 99 Standards Handbook.

B. AMCA 210 Laboratory Methods for Testing Fans for Rating Purposes.

C. AMCA 300 Test Code for Sound Rating Moving Air Devices.

D. ASHRAE Handbook 2001 Fundamentals; Chapter 32 – Duct Design.

E. ASHRAE Handbook 2000 Equipment; Chapter 16 – Duct Construction.

F. ASTM A 366 Steel, Sheet, Carbon, Cold Rolled, Commercial Quality.

G. ASTM A 525 General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process 1.3.8 ASTM A 527 Steel Sheet, Zinc-Coated (Galvanized) by Hot-dip Process, Lock Forming Quality.

H. NFPA 90A Installation of Air Conditioning and Ventilating Systems.

I. SMACNA HVAC Duct Construction Standards - Metal and Flexible.

1.4 System Description:

A. The ventilation system consists of ductwork, dampers, louvers and supply and exhaust fans for the MCC Control Room, Pump Access Room, and the Lower Level/Trash Rack/Wet Well areas. The MCC Control Room ventilation system will operate when the temperature is above 85°F. The Pump Access Room and Lower Level/Trash Rack/Wet Well ventilation system will operate when the lower level & wet well lights are turned on, when combustible gas is detected, or when temperature is above 85°F. A “Hand-Off-Auto” switch will be provided for each system to allow manual operation.

B. All fan and damper motors associated with the Pump Access Room and the Lower Level/Trash Rack/Wet Well area shall be rated for Class 1, Div. 2 Group D hazardous locations. Fans shall be AMCA type B spark proof. Fan motors and drives shall be located in a ventilated enclosure outside of the airstream or have NEMA 7 explosion-proof construction. Damper motors shall be installed outside of the airstream, NEMA 7 explosion proof for Class 1, Division II Group D locations.

1.5 Submittals

A. Submit shop drawings and product data.

B. Submit detailed drawings and design data.

1.6 Guarantee

A. All equipment shall be guaranteed from all defects of material and workmanship for the manufacturer's standard length of guarantee or for 1 year from the date of final acceptance, whichever is longer.

1.7 Delivery, Storage and Handling

A. Delivery, storage and handling in accordance with Manufacturer’s Instruction manual.

1.8 Definitions:

A. Low Pressure Ductwork (Three pressure classifications):

1. 125 Pa (1/2 inch WG) positive or negative static pressure and velocities less than 10 m/sec (2,000 fpm)
2. 250 Pa (1 inch WG) positive or negative static pressure and velocities less than 12.7 m/sec (2,500 fpm)
3. 500 Pa (2 inch WG) positive or negative static pressure and less than 12.7 m/sec (2,500 fpm).

PART 2 - PRODUCTS

2.1 Supply Fans SF-1

A. General

1. Supply fan SF-1 shall be a belt-drive, cabinet type fan. Fan airflow, static pressure, and size shall be as noted in the fan schedule in paragraph 3.4.

B. Ratings

1. All fans shall conform to AMCA 210 and bear the AMCA Certified Rating Seal.
2. All fans shall conform to AMCA 301, tested to AMCA 300 and bear the AMCA Certified Sound Rating Seal.

C. Fabrication

1. All fans shall conform to AMCA 99.
2. Statically and dynamically balance fans to eliminate vibration or noise in occupied areas.
3. Supply fan SF-1 shall have a weatherproof drive enclosure with a louver and control damper assembly.

D. Performance

1. Fans used shall not decrease motor size, increase noise level, or increase tip speed by more than 10 percent, or increase inlet air velocity by more than 20 percent, from specified criteria. Fans shall be capable of accommodating static pressure variation of plus or minus 10 percent. Base performance on sea level conditions.

E. Wheel:

1. Forward curved centrifugal wheel
2. Constructed of galvanized steel
3. Statically and dynamically balanced in accordance to AMCA Standard 204-05

F. Motors:

1. Motor enclosures: Open driproof
2. Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase
3. Mounted on vibration isolators located in airstream
4. Accessible for maintenance

G. Shafts and Bearings:

1. Fan shaft shall be ground and polished solid steel with an anti-corrosive coating
2. Permanently sealed bearings or pillow block ball bearings
3. Bearing shall be selected for a minimum L10 life in excess of 100,000 hours (equivalent to L50 average life of 500,000 hours), at maximum cataloged operating speed
4. Bearings are 100 percent factory tested
5. Fan Shaft first critical speed is at least 25 percent over maximum operating speed

H. Housing:
   1. Constructed of heavy gauge galvanized steel
   2. Rectangular design construction and shall include rectangular duct mounting collars
   3. Includes pre-punched mounting brackets
   4. Profile as low as 11 inches
I. Housing Supports and Drive Frame:
   1. Drive frame assemblies shall be constructed of heavy gauge steel and mounted on vibration isolators
   2. Designed with belt adjustment to eliminate scroll damage
J. Duct Collars:
   1. Provided for easy duct connections for outlet and inlet collars
K. Drive Assembly:
   1. Belts, pulleys, and keys oversized for a minimum of 150 percent of driven horsepower
   2. Belts: Static free and oil resistant
   3. Pulleys: Cast type, keyed, and securely attached to wheel and motor shafts
   4. Motor pulleys are adjustable for final system balancing
   5. Readily accessible for maintenance
L. Access Panel:
   1. Panel type: Hinged
   2. Access to all internal components
M. Mounting Brackets:
   1. Fully adjustable for multiple installation conditions
N. Options/Accessories:
   1. Filter Box:
      a. Type: Single sloped angles
      b. Constructed of galvanized steel
      c. Available in 1 or 2 inch disposable media or permanent washable aluminum mesh
   2. Finishes:
      a. Types: Baked Enamel

2.2 Dampers

A. Provide motorized dampers, mounted within the ductwork from the intake louver to the fan cabinet. The damper size shall be as noted in the damper schedule in paragraph 3.5.
B. Fabrication: 18 gage galvanized steel frame with 3-½" depth, roll formed aluminum blades 0.032" - 0.040", 3/16" diameter plated steel stub axles turning in acetyl bearings, extruded vinyl blade seals and internal 0.064" aluminum tie bar (on-blade).
C. Damper motor shall be 2-position type connected to the damper via adjustable linkage. Power for the motor shall be 120 VAC, single phase. The motor shall be of suitable power to drive the damper to the full open position.

2.3 Exhaust Fans EF-1

A. Exhaust fan EF-1 shall be belt-drive, in-line centrifugal fan. Fan airflow, static pressure, and size shall be as noted in the fan schedule in paragraph 3.4.

B. Ratings

1. All fans shall conform to AMCA 210 and bear the AMCA Certified Rating Seal.
2. All fans shall conform to AMCA 301, tested to AMCA 300 and bear the AMCA Certified Sound Rating Seal.
3. Fan and damper motors in Pump Access Room shall be listed for use in Class 1 Division II Group C & D areas.

C. Fabrication

1. All fans shall conform to AMCA 99.
2. Statically and dynamically balance fans to eliminate vibration or noise in occupied areas.
3. Exhaust fan EF-1 shall be through the exterior wall with a louver and control damper assembly.

D. Performance

1. Fans used shall not decrease motor size, increase noise level, or increase tip speed by more than 10 percent, or increase inlet air velocity by more than 20 percent, from specified criteria. Fans shall be capable of accommodating static pressure variations of plus or minus 10 percent. Base performance on sea level conditions.

E. Wheel:
   1. Non-overloading, backward inclined centrifugal wheel
   2. Constructed of aluminum
   3. Statically and dynamically balanced in accordance to AMCA Standard 204-05
   4. The wheel cone and fan inlet will be matched and shall have precise running tolerances for maximum performance and operating efficiency
   5. Single thickness blades are securely riveted or welded to a heavy gauge back plate and wheel cone.

F. Motors:
   1. Motor enclosures: Explosion resistant enclosure
   2. Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase

G. Shafts and Bearings:
   1. Fan shaft shall be ground and polished solid steel with an anti-corrosive coating
   2. Permanently sealed bearings or pillow block ball bearings
   3. Bearing shall be selected for a minimum L10 life in excess of 100,000 hours (equivalent to L50 average life of 500,000 hours), at maximum cataloged operating speed
   4. Fan Shaft first critical speed is at least 25 percent over maximum operating speed

H. Housing/Cabinet Construction
   1. Square design constructed of heavy gauge galvanized steel and shall include square duct mounting collars
   2. Housing and bearing supports shall be constructed of heavy gauge bolted and welded steel construction to prevent vibration and to rigidly support the shaft and bearing assembly.
   3. Aluminum construction is available in sizes 70-300

I. Housing Supports and Drive Frame:
    1. Housing supports are constructed of structural steel with formed flanges
    2. Drive frame is welded steel which supports the shaft and bearings and reinforcement for the housing
    3. Pivoting motor plate with adjusting screws to make belt tensioning operations
J. Drive Assembly:
    1. Belts, pulleys, and keys oversized for a minimum of 150 percent of driven horsepower
    2. Belts: Static free and oil resistant
    3. Pulleys: Cast type, keyed, and securely attached to wheel and motor shafts
    4. Motor pulleys are adjustable for final system balancing
    5. Readily accessible for maintenance
K. Duct Collars:
    1. Square design to provide a large discharge area
    2. Inlet and discharge collars provide easy duct connection
L. Access Panel:
    1. Two sided access panels, permit easy access to all internal components
    2. Located perpendicular to the motor mounting panel
M. Options/Accessories:
    1. Belt Guards:
        a. Three-sided fabricated steel belt guard covers drive and motor
    2. Belt Type:
        a. Type: Standard
    3. Finishes:
        a. Coating type: Industrial Epoxy
    4. Isolation:
        a. Type: Neoprene/Rubber Mount.
        b. Sized to match the weight of each fan
    5. Motor Cover:
        a. Constructed of galvanized steel
        b. Covers motor and drives for safety
        c. Standard on unit specified with UL
    6. Pressure Probe:
        a. ¼ inch diameter tube in fan venturi that allows hook up to manometer
    7. Wiring Pigtail:
        a. Direct hook-up to the power supply
        b. Nine foot wiring extension

2.4 Fixed Louver/Motorized Damper Assembly (LV-1, LV-2 and LV-3)

A. General

Provide a combination fixed louver/motorized damper, with external bird screen for supply and exhaust. Louver airflow, service and size shall be as noted in the fan schedule in paragraph 3.6.

B. Fabrication

1. Frame shall be constructed of .080" extruded aluminum with .072" extruded aluminum blades. Fittings shall be plated center steel brackets, brass pivots and a 5/16" diameter plated steel linkage rod. Operating arm shall be 14 gage galvanized steel. Cover channel shall be .063" aluminum. Blade edge seals shall be vinyl gasketing extending the full length of the adjustable blades. Provide standard mill finish.

C. Bird Screen

1. Provide an internally mounted bird screen. The screen shall be constructed of .051" x 3/4" diamond pattern expanded aluminum.

D. Insect Screen

1. Provide an externally mounted insect screen. The screen shall be constructed of 0123" diameter aluminum mesh giving a free area ratio of 60%.

E. Damper

1. Damper per paragraph 2.3.
2. Control Damper to be interlocked to associated fan and mounted within louver assembly. See detail 1 on sheet HV-1 and Control Damper Schedule in paragraph 3.5.

F. Damper Motor

1. Power for the motor shall be 120 VAC, single phase. Damper motors that are exposed to hazardous atmospheres shall be explosion proof.

G. Field Finish

1. Finish exterior of fixed louver to matching color of exterior metal. Color: Dove Grey.

2.5 Relief Hood/Motorized Damper Assembly (RH-1)

A. General

1. Provide a combination relief hood/motorized damper, with external bird screen for exhaust damper D-RH1.

B. Fabrication

1. Aluminum sheet, minimum 0.063 inch (1.6 mm) thick base and 0.050 inch (1.27 mm) thick hood; suitably reinforced. Fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figures 6-6 and 6-7.

C. Bird Screen

1. Provide an externally mounted bird screen. The screen shall be constructed of .051" x 3/4" diamond pattern expanded aluminum.

D. Damper

3. Damper per paragraph 2.3.
4. Control Damper to be interlocked to associated fan and mounted within louver assembly. See detail 1 on sheet HV-1 and Control Damper Schedule in paragraph 3.5.

E. Damper Motor

1. Power for the motor shall be 120 VAC, single phase. Damper motors that are exposed to hazardous atmospheres shall be explosion proof.

F. Field Finish

1. Finish exterior of hood to matching color of exterior. Color: Dove Grey.

2.6 Low Pressure Ductwork

A. General

1. Non-combustible or conforming to requirements for Class 1 air duct materials, or UL 181.
2. Galvanized (hot dipped) Steel Ducts: ASTM A525 or ASTM A527 hot dipped galvanized steel sheet, lock-forming quality, having zinc coating of 1.25 oz. per sq. ft. (382 g/sq. m) for each side in conformance with ASTM A90. Galvanized ducts shall be installed for all supply and exhaust ducts except for ducts serving the wet well. Ductwork shall conform to the 250 Pa (1 inch WG) pressure class per Section 1.8.
3. Stainless Steel Ducts: ASTM A366. Stainless steel ducts shall be installed for the supply and exhaust ducts serving the wet well location. Ductwork shall conform to the 250 Pa (1 inch WG) pressure class per Section 1.8.
4. Fasteners: rivets, bolts, or sheet metal screws matching duct materials.
5. Sealant: non-hardening, water resistant, fire resistive, compatible with mating materials; liquid used alone or with tape, or heavy mastic.
6. Hanger Rod: Match duct material; threaded both ends, threaded one end, or continuously threaded.

B. Volume dampers shall be provided for air balance purposes. Provide manual volume dampers on all low pressure supply and exhaust duct branches and to all air inlets and outlets unless otherwise noted. Dampers shall be opposed blade type of same material as associated ductwork. Volume dampers to be locking type with lever handle, position indicator and lock nut. Damper to be by Ruskin, Greenheck, Nailor or approved equal.

C. Fabrication

1. Fabricate and support in accordance with SMACNA Low and Medium Pressure Duct Construction Standards and ASHRAE handbooks, except as indicated.
2. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by written permission.

3. Construct tees, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide turning vanes.
4. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream of equipment shall not exceed 30 degrees; convergence downstream shall not exceed 45 degrees.
5. Provide easements where low pressure ductwork conflicts with piping and structure. Where easements exceed 10 percent duct area, split into two ducts maintaining original duct area.
6. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of airflow.
7. Use double nuts and lock washers on threaded rod supports.

PART 3 - EXECUTION

3.1 General

A. All equipment shall be installed in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Section 012000 - General Requirements and Section 150000. The manufacturer shall inspect all fans and louver assemblies and shall certify that the ventilation equipment has been installed properly. Information submitted for approval shall include a letter of intent to provide this certification. All mechanical installation and wiring shall be completed and all necessary adjustments to equipment shall be made to provide a complete operational installation.

B. The manufacturer shall have joint responsibility with the Contractor for the proper installation of the equipment, and jointly with Contractor shall furnish a written statement to the Owner certifying that the equipment as installed complies with the Plans and Specifications, will perform as specified, and is properly installed.

C. Install and seal ducts in accordance with "SMACNA HVAC Duct Construction Standards – Metal and Flexible."

D. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

E. Streamline all ductwork to the full extent practical and equip with proper and adequate devices to assure proper balance and distribution of indicated air quantities.

F. Prior to ductwork fabrication, verify if all ductwork as dimensioned and generally shown will satisfactorily fit allocated spaces. Take precautions to avoid space interference with beams, columns, joists, pipes, lights, conduit, other ducts, equipment, etc. Notify Architect/Engineer if any spatial conflicts exist, and then obtain Architect/Engineer's approval of necessary routing. Make any such necessary revisions that are minor at no additional cost.

G. Carefully coordinate all duct connections to fans to provide proper connections, elbows and bends that minimize noise and pressure drop.

H. Provide all curved elbows with radius ratios of not less than 1.5 unless otherwise shown or approved by Architect/Engineer. Provide all mitered elbows with turning vanes.

I. Carefully suspend all ductwork so that no objectionable conditions result (such as vibration, sagging, etc.)

J. Coordinate any and all dimensions at interfaces of ductwork and at interfaces of ductwork with equipment so that proper overlaps, interfaces, etc. are maintained.

K. Changes in direction: Changes in direction shall be basically as indicated on the drawings and the following shall apply:

1. Supply duct turns of 90 degrees in low pressure duct shall be made with mitered elbows fitted with closely spaced turning vanes designed for maintaining a constant velocity through the elbow.
2. Return and exhaust duct turns of 90 degrees in low pressure duct shall be made with mitered elbows, as specified herein before, for supply ducts, unless radius elbows are indicated in which case they shall be vaned and constructed with a turning radius 1-1/2 times the width (width considered as the dimension in the plane of the turn) as measured to the duct centerline.
3. Tees in low-pressure duct shall conform to the design requirements specified herein before for elbows.

3.2 Field Quality Control

A. Representative of the Manufacturer

1. The services of a qualified representative of the manufacturer shall be provided to instruct on proper installation of the equipment, inspect the completed installation, make any necessary adjustments, participate in the startup of the equipment, place the equipment in trouble-free operation, and instruct operating personnel in its operation and maintenance.

3.3 Start-Up Services

A. IDOT shall be notified at least two (2) weeks before start-up services are required.

B. The equipment manufacturer shall provide the services of a field representative for a total of two (2) trips for a total of not more than two (2) working days for the purpose of instruction and assisting the Contractor and the IDOT's personnel in the start-up and proper operation of the equipment. Manufacturer's representative shall provide written certification that equipment has been installed in accordance with their requirements.

C. The equipment manufacturer shall furnish operating and maintenance instructions for the equipment.

D. The manufacturer shall provide written certification that the equipment has been installed in accordance with their requirements.

3.4 Fan Schedule:

A. See schedule on drawings

3.5 Damper Schedule:

A. See schedule on drawings.

3.6 Louver Schedule:

B. See schedule on drawings.

END OF THIS SECTION 150040

SECTION 150050 - TRASH RACK

PART 1 - GENERAL

1.1 Section Includes trash rack as shown on the plans.

1.2 Related Sections

A. IDOT Standard Specifications – for Cast-In-Place Concrete and Grout

B. Section 055000 – Metal Fabrications

C. Section 150000 - General Mechanical Provisions

D. Section 150010 - Basic Mechanical Materials and Methods Concrete Inserts

1.3 Submittals

A. Submit shop drawings and product data under provisions of Section 012000 - General Requirements.

B. Submit detailed drawings and data.

PART 2 - PRODUCTS

2.1 General Requirements

A. The contractor shall provide a complete working, manually cleaned bar screen.

2.2 Bar Screen Specifics

A. General Design

1. The unit shall comprise a complete assembly consisting of bars, support frame and anchorages to provide a complete operating system. The bar screen shall be fabricated according to dimensions and details provided on the plans.

2.3 Anchorage

A. All anchor bolts, nuts and washers shall be stainless steel and installed by the Contractor in accordance with certified dimension prints furnished by the equipment manufacturer.

PART 3 - EXECUTION

3.1 General

A. All equipment shall be installed in accordance with the approved shop drawings and as specified in Section 012000 - General Requirements and Section 150000. The manufacturer shall inspect the equipment installation and shall certify that the bar screen and rake have been installed properly.

END OF THIS SECTION 150050

SECTION 150060 - MISCELLANEOUS ITEMS

PART 1 - GENERAL

1.1 Section Description

A. This Section shall include all work required for the furnishing and complete installation of the Items indicated on the Drawings, as specified herein and as follows:

1. Cable Supports
2. Refer to Section 012000 - General Requirements for additional requirements.

1.2 Related Sections

A. Section 150000 - General Mechanical Provisions

B. Section 150010 - Basic Mechanical Materials and Methods

C. Section 150020 - Piping and Appurtenances

D. Section 150030 - Pumping Equipment

E. Section 160030 - Packaged Engine Generator System

1.3 Submittals

A. Submit shop drawings and product data under provisions of Section 012000 - General Requirements.

1.4 Delivery, Storage and Handling

A. Delivery, storage and handling shall be in accordance with the provisions under Section 012000 - General Requirements.

1.5 Guarantee

A. Provide guarantee under provisions of Section 012000 - General Requirements.

PART 2 - PRODUCTS

2.1 Cable Supports

A. The cable supports shall be supplied by the pump manufacturer and shall be installed according to their instructions. The cable support shall be complete and shall support all cables required for the main pumps and low-flow pump whether or not shown on the Drawings. Cable grips and hardware shall be stainless steel.

PART 3 - EXECUTION

3.1 Installation

A. Install the specified specialties in accordance with manufacturer's recommendations and instructions to permit intended performance.

B. The manufacturer or supplier of the specified specialties shall furnish a qualified field engineer for whatever period of time may be necessary to assist and direct the Contractor in the proper installation of the equipment furnished, to observe and check initial performance, and whose duty shall include the instruction of the plant operating personnel in the proper operating and maintenance procedures.

3.2 Painting

A. The specified specialties shall be painted in accordance with Section 9 of these specifications.

3.3 Testing

A. The specialties shall be tested in place by the Contractor, and any defects in specialties or connections shall be corrected to the satisfaction of the Engineer.

END OF THIS SECTION 150060

DIVISION 16 – PUMP STATION ELECTRICAL WORK
SECTION 160000 - GENERAL ELECTRICAL PROVISIONS

PART 1 - GENERAL

1.1 Scope of Pump Station Electrical Work

A. The scope of work under this item shall generally be all electrical work required for the pump station and the electric service installation as specified or as indicated on the drawings.

B. The electrical work shall include the furnishing and installing of various items of electrical equipment and, unless otherwise indicated, shall also include the electrical connection of various items such as motor control center, submersible pump motors, fan motors, PLC, instrumentation and other similar items. The Contractor shall be responsible for ascertaining the extent of electrical connections required for items furnished under other Sections and for coordination of the electrical work accordingly.

C. The specifications and drawings are intended to generally define the work required, but they do not include every equipment and installation detail. The work shall include all items and appurtenances required to fully complete the work, whether specifically identified or not, such that the electrical systems are complete and operational.

D. Refer to Section 012000 for other requirements relating to the furnishing and installing of the Pump Station Electrical Work.

1.2 Code Compliance

A. Unless otherwise indicated, in the absence of more stringent requirements in the Specifications or on the Drawings, the work shall be in compliance with the requirements of the 2014 National Electrical Code.

1.3 Standards

A. Wherever the following abbreviations are used in these Specifications or on the Drawings, they are to be construed the same as the respective expressions represented:

AASHTO	American Association of State Highways and Transportation Officials
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
AWG	American Wire Gauge
FM	Factory Mutual
ICEA	Insulated Power Cable Engineers Association
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society of North America
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association
UL	Underwriter's Laboratories

B. Wherever a reference is made to a standard or standard specification, the reference shall be to the edition current at the time of bidding, including any revisions or amendments.

1.4 Verification of Contract Drawings

A. The Contractor shall familiarize himself with the details of the total construction in so far as they may affect the work under this Division, including floor elevations, physical dimensions of structures, materials of construction and the nature of work required under other Sections. No additional compensation will be granted for failure to consider the total pump station.

B. The contract drawings (Drawings) for electrical work are generally diagrammatic and do not necessarily depict all items to scale. The Drawings indicate the general locations of major elements of the electrical system, outlets, fixtures, pull boxes and the like, however, field conditions or interferences, may require changes in the installation. The Contractor shall coordinate his work to avoid interferences and shall obtain the approval of the Engineer prior to making any changes from the installation shown.

C. Prior to installation, the Engineer may make reasonable minor changes in the locations of the installation. No additional compensation will be granted for such changes.

1.5 Coordination

A. The Contractor shall coordinate the work under this Division with the work of other trades. This shall include an orderly exchange of information and shall be accomplished such that the total work is not delayed and that interference is avoided. The Contractor shall coordinate all electrical systems into a complete operational package. The Contractor shall assign one contact person for all such co-ordination work, has an understanding and working knowledge of the electrical control systems on this project. This person shall oversee and assume proper operation of the complete electrical control system including all testing and calibration as outlined herein. The Contractor shall provide the name and phone numbers of this individual at the pre-construction inspection. This cost shall be incidental to Pump Station Electrical work.

1.6 Workmanship

A. The electrical work shall be performed in a neat and workmanlike manner in accordance with the best practices of the trade.

B. Unless otherwise indicated, all materials and equipment shall be installed in accordance with the manufacturer's recommendations.

1.7 Testing

A. All electrical equipment and systems provided under this Division should be adjusted and tested. The Contractor shall adjust, repair or replace faulty or improper work or equipment discovered during testing.

B. In addition, all electrical items provided under other Divisions and connected and/or adjusted under this Division shall be tested and if a failure occurs due to the connecting or adjusting methods used, the failure shall be remedied under this Division by repair, replacement, or change, as determined by the Engineer, at no additional cost to the IDOT.

C. Tests may be made progressively as portions of the work are completed.

D. Tests shall be made in the presence of the Engineer.

E. A written record of tests shall be maintained by the Contractor and, when completed, it shall be submitted to the Engineer for the record.

F. The Contractor shall perform all tests necessary to assure proper functioning of materials and equipment. As a minimum, the tests shall include the following:

1. Before making final connections check the insulation resistance of all cables of 3-phase circuits that operate above 150 volts.
2. Check wiring for proper phase sequencing including buses, feeder cables and transformers and assure proper connection at motors for proper rotation.
3. Measure and record the line-to-line and line-to-neutral voltages at the line side of the service entrance, all panel buses or main terminals and at the primary and secondary terminals of all transformers furnished under this Division except for control transformers which are integral to motor starter units. Set the taps on transformers as specified in Paragraph 3.8.A. or as directed by the Engineer.
4. Check and record the motor nameplate data for each 3-phase motor. Check the ratings of motor circuit protective devices and assure compatibility of the devices for the connected motors. In particular, assure that the motor starter overload elements are proper for the motor nameplate full load amperes.
5. Set control relays, protective relays and instruments in accordance with manufacturer's recommendations. Record the set points.
6. Check all control circuits for proper functioning of all devices and check all switches, contactors, pushbuttons, limit switches, thermostats, circuit breakers and the like for proper operation.
7. Check all alarm circuits for proper operation and proper set points, as applicable. Record any appropriate set points.
8. Measure and record the line currents of each phase of each 3-phase motor under load.
9. Align and adjust lighting fixtures and assure proper operation of all controls, ballasts and lamps.
10. All equipment must be properly calibrated for proper operation of the system.
11. Disable the PLC to ensure that the back-up float system operates properly.
12. Disable the level sensor system to make sure that the back-up float system operates properly.

Observe the level sensor and float operation during rising and falling water levels in the wet well.

G. Test the operation of the pumps during a simulated power outage by having Ameren open the connection to the station. During this outage, check that the TAS and generator operate properly and that the system controls function as required to operate the pump systems. Testing must be complete prior to final inspection. All instruments, tools, etc. required for the tests shall be provided by the Contractor. All equipment shall be properly calibrated for proper operation of the complete system. Additional testing may be requested by the Engineer during final inspection to spot-check test results or to demonstrate proper functioning of the systems. The Contractor at no additional cost to the State shall perform these tests.

H. The Contractor shall simulate the automatic operation of the complete pump station to assure proper operation. After assurance of proper operation, the Contractor shall demonstrate automatic operation including simulation to the Engineer's satisfaction.

I. Note that failure to test the equipment completely is not an allowance for an extension.

1.8 Data to be filed with the Engineer

A. Submit shop drawings and product data under provisions of Section 1A. Certain data, as specified herein, shall be furnished to the Engineer when installation and testing are completed, before final acceptance.

B. The data shall be compiled in 8-1/2 x 11-inch format in high-quality heavyweight, hard cover binders with piano-style metal hinges or in an alternate format approved by the Engineer. Large drawings and other materials, which would be opened or removed for reading, shall be provided with heavy clear plastic pouches within the binders. The number of binders shall be as required to hold all required material without over-filling. Various sections, as appropriate shall have suitable dividers. All volumes shall be labeled.

C. Four sets of the data files shall be provided.

D. As a minimum, the data files shall include:

1. A table of contents.
2. Approved final shop drawings and product data for all equipment and materials incorporated in the work under this Division.
3. Manufacturer's maintenance manuals for all equipment furnished under this Division for which maintenance is recommended by the manufacturer.
4. A tabulation of electric service information, including utility’s line number, transformer number and meter number and available short circuit capacity.
5. A tabulation of cable insulation tests.
6. A tabulation of motor nameplate data.
7. A tabulation of required voltage tests.
8. A tabulation of required motor current tests.
9. A tabulation of relay and control device set points.
10. A tabulation of alarm set points.

E. All data shall be neat and clearly legible. The table of contents and tabulations of set points and other recorded test data shall be typed. Sloppy, illegible, inaccurate, or incomplete data will not be accepted.

1.9 Record Drawings

A. Alterations and additions to the electrical installation depicted on the contract drawings which are made during the execution of the work shall be neatly and plainly marked in red on a set of Record Drawings kept at the contractor's field office for the project. These drawings shall be updated as the work progresses and shall be available for inspection by the Engineer at all times during the course of the work.

B. When the work is completed, and before final acceptance, a set of Record Drawings shall be submitted to the Engineer for review and acceptance. The set shall include the marked field set and a set of reproducible drawings. A set of reproducible drawings will be supplied to the Contractor for use in preparing the Record Drawings. The drawings shall each be stamped "RECORD DRAWING", and shall be marked with the contractor's stamp, the date, and the signature of the contractor's supervising engineer or electrician.

C. The Record Drawings must be submitted and must be acceptable to the Engineer prior to final acceptance. There will be no deviation from this requirement.

1.10 Guarantees

A. Guarantees shall be provided for equipment, materials and work provided under this Division as specified in respective sections.

PART 2 - PRODUCTS:

2.1 Materials and Equipment

A. Quality

1. All materials, equipment and appurtenances shall be new, shall be suitable for the application and shall be the product of established, reputable manufacturers.

B. Standards

1. The construction, sizes, ratings and capacities of items shall be in conformance with the requirements of the NEC and with NEMA standards, as applicable.

C. UL Label

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

D. Service Equipment

1. Equipment that is used as electric service equipment shall bear an UL listing: "SUITABLE FOR USE AS SERVICE EQUIPMENT".

2. Provide CT cabinet, PT Cabinet, Meter fitting and transformer pad in accordance with the local utility requirements.

PART 3 - EXECUTION:

3.1 General

A. Provide other trades with advance information on locations and sizes of concrete pads, frames, boxes, sleeves and openings needed for the Work. Also provide information and shop drawings necessary to permit trades affected to install their Work properly and without delay.

B. Prior to submittal of shop drawings, coordinate electrical equipment, particularly motor control equipment and control panels, with all applicable equipment and systems furnished under other Sections of the Specifications. Special attention shall be called to the requirements of Instrumentation and Controls specified under Division 15. Acknowledge in submittal drawings any designated instrument tag numbers when tag numbers are assigned in drawings or specifications. Acknowledge that coordination of all applicable equipment has been performed.

C. The electrical system design, including, but not limited to, the type, size and quantity of equipment and components, layout, installation and connections as shown on Plans and/or as indicated in the Specifications, is based on electrical, electro-mechanical and/or electronic equipment supplied by selected manufacturers. If equipment furnished by the Contractor requires a different electrical system than that specified hereinafter or shown on Plans, the Contractor shall make all necessary modifications to the electrical system design, subject to the Engineer's approval, to provide a complete electrical system ready for successful operation. The costs of making the modifications to the electrical system shall be entirely borne by the Contractor without extra cost to the Engineer. If equipment furnished by the Contractor necessitates changes to electric, gas and/or telephone utilities' service equipment, or to the Work specified under other Sections of the Specifications, then the cost for making the changes shall also be entirely borne by the Contractor without extra cost to the Engineer.

D. Locate all equipment such that they are readily accessible for operation, maintenance, repair and replacement. Ready accessibility to removable parts of equipment and to wiring shall be provided without moving other equipment, which is to be installed, or which is in place. In general, such equipment is not to be blocked or concealed except where specifically permitted. Do not route conduits across or through access or maintenance space of other equipment. Where equipment is permitted to be concealed, provide approved access door. Where equipment is concealed in fire-resistance rated walls or partitions, provide access doors having same fire-resistance rating as well as partitions in which door is placed.

E. Where electrical equipment is to be installed in limited space, provide additional drawings (scale - minimum 1/4 in. = 1 ft.) as necessary to show physical and dimensional relationship between electrical equipment and adjacent equipment furnished under other Sections of the Specifications. Acknowledge locations of adjacent structural or mechanical systems, including ductwork, piping, or equipment accesses. Acknowledge clearances established by all codes and regulations are met or exceeded.

F. The installation shall be such that its components will function together as workable systems. It shall be completed, with all accessories necessary for its operation, and shall be left with all equipment properly adjusted and in working order. The Work shall be executed in conformity with the best practices and so as to contribute to efficiency of operation, minimum maintenance, accessibility and appearance.

G. Locations of electrical equipment shown on Plans are approximate and are subject to minor changes as directed by Engineer and at no extra cost to IDOT.

H. Perform equipment tests as per manufacturer's instructions except where otherwise specified.

I. All wiring for the demolished equipment shall be disconnected and removed from the sources.

3.2 Protection of Work

A. All electrical work, including equipment, fixtures and appurtenances shall be protected from damage until final acceptance. Fixtures and equipment shall be covered to protect against dirt, moisture, paint and the like. The work shall be protected from mechanical injury by appropriate covering or shielding.

B. Prior to final acceptance, protective measures shall be removed and equipment and items shall be cleaned as required to deliver the installation to the State in clean, undamaged condition.

3.3 Clean-Up and Safety

A. The work site shall be maintained in a clean condition, free of hazards, all in conformance with the requirements of Article 107 of the Standard Specifications. Special care shall be taken to assure that electrical systems are not left in an exposed or otherwise hazardous condition. All electrical boxes, cabinets, pole handholes, etc., which contain wiring, either energized or non-energized, shall be closed or shall have their covers in place and shall be locked when possible, during off-work hours.

3.4 Electric Service

A. Work shall include all equipment, wiring and appurtenances required for complete and operational permanent electric service.

B. The Drawings and Specifications indicate the general nature of work required for providing new Ameren electric service. The Contractor shall verify the location of the service drop and the service requirements, shall ascertain the utility's installation requirements and the items of equipment, wiring, appurtenances being furnished by the utility, and shall provide all other material and work required for a complete installation.

C. The Contractor shall furnish and install 4" Schedule 40 PVC conduit, minimum 30" below grade, from the transformer pad to the utility pole shown on the plans with 36" radii bends, and riser as shown on plan sheet E-2. The Contractor shall clean the conduit after installation and install a pull rope. The primary cable will be installed by the utility.

D. All electric service work must conform to the requirements of the electric utility.

E. The Contractor shall obtain approval of the electric utility for the electric service and metering prior to installation. Copies of approved documents and drawings shall be submitted to the Engineer for the record prior to installation.

F. The Contractor shall pay any charges by the utility company to provide the gas service. The Contractor will be paid for these charges separately under ELECTRIC UTILITY SERVICE CONNECTION pay item as specified in article 1.4 of Section 011000.

3.5 Equipment Pads

A. Provide generator pad, transformer pad and equipment pads in Electrical Room.

B. The contractor shall verify the size, location and orientation of the pads and other requirements such as openings, conduits and anchor bolts in writing with the utility company and the equipment manufacturer.

C. The pad design for transformer pad and generator pad is based on net allowable bearing capacity of 2,500 psf.

D. The subgrade for pads shall be inspected, prior to placement of aggregate sub-base, by the department's soils engineer to verify bearing capacity as specified. The soils engineer shall certify in writing that the pads were placed on soil with the bearing capacity as specified.

E. The aggregate sub-base shall be placed according to Section 311 of the standard specifications. It shall be placed in layers not to exceed 8" in loose thickness and compacted to a minimum of 95% of the maximum dry density obtained according to ASTM D698 standard proctor method.

F. Concrete shall be Class SI according to article 1020.04 of the standard specifications.

G. Reinforcing bars shall conform to ASTM A706, Grade 60 according to article 1006.10 of the standard specifications.

H. The pads shall be constructed according to sections 503 and 508 of the standard specifications.

I. The cost of pads, including excavation, subgrade preparation, sub-base, reinforcing bars and concrete, shall be included with the lump sum cost of PUMP STATION ELECTRICAL WORK.

3.6 Telephone Service

A. Work under this section shall include all equipment, wiring and appurtenances required for complete, operational telephone service and telephone connections to Control Panel, Intrusion Alarm Panel, Fire Alarm Control Panel (FACP) and wall outlet. Coordinate with the telephone utility and provide new telephone service and telephone wiring inside the station. The telephone service shall include two telephone lines to the station. One of two lines shall be dedicated to FACP and the second line will be shared by FACP, Intrusion Alarm panel, Control Panel and wall outlet. The inside wiring shall be terminated accordingly. The telephone service conduit with outside wiring shall be stubbed out at the telephone backboard and the outside wiring shall be terminated on the backboard. All inside wiring shall be installed in conduit.

B. Coordinate the telephone service ordering and installation with Mr. Pat Engelbrecht of the Village of Meredosia, telephone number (217) 584-1351. Any charges by the utility company to provide telephone service to the service installation shall be paid to the utility company by the Contractor, and shall be included in the pay item PUMP STATION ELECTRICAL WORK.

C. All telephone service work must conform to the requirements of the telephone utility.

D. The Contractor shall obtain approval of the telephone utility for the service prior to installation. Copies of approved documents and drawings shall be submitted to the Engineer for the record prior to installation.

3.7 Electrical Power System Studies

A. Studies shall include Utility Serve, Generator Service, Motor Control Center, Submersible pumps, auxiliary panel, cable, wire and conduit systems

B. Short Circuit Study. Provide complete report with printout data sheets using computer based programs as part of study. Include utilities' short circuit contribution, resistance and reactance components of branch impedances, X/R ratios, base quantities selected, and other source impedances. Calculate short circuit momentary duty values and interrupting duty values based on assumed 3-ph bolted short circuit at low voltage MCC, distribution panelboard, pertinent branch circuit panel, and other significant locations through system. Include short circuit tabulation of symmetrical fault currents and X/R ratios. List with respective X/R ratio each fault location, total duty on bus, and individual contribution from each connected branch.

C. Protective Device Evaluation Study. Provide protective device evaluation study to determine adequacy of circuit breakers, molded case switches, automatic transfer switches, knife switches, controllers, surge arresters, busways, and fuses by tabulating and comparing short circuit ratings of these devices with calculated fault currents. Apply appropriate multiplying factors based on system X/R ratios and protective device rating standards. Notify Engineer of problem areas or inadequacies in equipment due to short circuit currents and provide suggested alternate equipment.

D. Equipment Device Coordination Study. Provide protective device coordination study with necessary calculations and logic decisions required to select or check selection of power fuse ratings, protective relay characteristics and settings, ratios and characteristics of associated current transformers, and low voltage breaker trip characteristics and settings. Objective of study to obtain optimum protective and coordination performance from these devices. Include as part of coordination study, medium and low voltage classes of equipment from utility's incoming line protective device down to and including largest rated device in 480V MCCs and panelboards. Include phase and ground overcurrent protection as well as settings of other adjustable protective devices.

   Draw time-current characteristics of specified protective devices in color on log-log paper or computer printout. Include with plots complete titles, representative one-line diagram and legends, associated Utility's relays or fuse characteristics, significant motor starting characteristics, complete parameters of transformers, complete operating bands of low voltage circuit breaker trip curves and fuses. Indicate types of protective devices selected, proposed relay taps, time dial and instantaneous trip settings, transformer magnetizing in-rush and ANSI transformer withstand parameters, cable thermal overcurrent withstand limits, and significant symmetrical and asymmetrical fault currents. Provide coordination plots for phase and ground protective devices on system basis. Provide sufficient number of separate curves to indicate coordination achieved. Provide separate selection and settings of protective devices in tabulated form listing circuit identification, IEEE device number, current transformer ratios and connection, manufacturer and type, range of adjustment, and recommended settings. Tabulate recommended power fuse selection for medium voltage fuses where applied in system. Notify Engineer of discrepancies, problem areas or inadequacies and provide suggested alternate equipment ratings and/or settings.

E. Arc Flash Study and Labeling. Provide Incident Energy Study – An incident energy study shall be done in accordance with the IEEE 1584, "IEEE Guide for Performing Arc Flash Hazard Calculations" as referenced in NFPA 70E, "Standard for Electrical Safety in the Workplace", in order to quantify the hazard for selection of personal protective equipment (PPE).

Adjust system design to optimize the results of the study as it relates to safety and reliable electrical system operation (e.g. overcurrent device settings, current limiting devices). This includes mitigation, where possible, of incident energy levels that exceed 40 calories/cm^2. Provide suggested alternate equipment and settings to minimize incident energy levels. Provide incident energy level (calories/cm^2) for each equipment location and recommended PPE.

Based on the results of the incident energy study provide and install a warning label (orange <40 cal/cm^2) or danger label (red > 40 cal/cm^2) for each piece of equipment. The label must be readable in both indoor and outdoor environments and contain the following information:

1. Arc hazard boundary (feet and inches)
2. Working distance (feet and inches).
3. Arc flash incident energy at the working distance (calories/cm2).
4. PPE category and description including the glove rating.
5. Voltage rating of the equipment.
6. Limited approach distance (feet and inches)
7. Restricted approach distance (feet and inches).
8. Prohibited approach distance (feet and inches).
9. Equipment/bus name.
10. Date prepared

F. Protective Device Testing, Calibration, and Adjustment

Comply with Section 160000, sub-section 3.8

3.8 Testing Electrical Systems

A. General

Test Work and equipment installed to ensure proper and safe operation in accordance with intent of Drawings and Specifications.

Check interlocking and automatic control sequences and test operation of safety and protective devices.

Correct defects found by Work of this Section.

Cooperate with Power Company, supplier, and manufacturer representatives in order to achieve proper intended operation of equipment.

Test, adjust, and record operating voltages at each system level before energizing branch circuits.

Transformer taps shall be adjusted to obtain as near as possible nominal system voltage. Where transformer is under utility jurisdiction, obtain services of utility to correct voltage. Replace devices and equipment damaged due to failure to comply with this requirement.

Balance load among feeder conductors at each panelboard, switchboard or substation and reconnect loads as necessary to obtain reasonable load balance on each phase. Electrical unbalance shall not exceed 20%.

B. Motor Control Center

1. Visual and Mechanical Inspections, as follows:

   a. Inspect for physical damage.
   b. Verify equipment supplied and connected in accordance with Specifications.
   c. Inspect for proper alignment, anchorage, and grounding.
   d. Check tightness of accessible bolted bus joints by calibrated torque wrench method. Refer to manufacturer's instructions for proper ft-lb levels.
   e. Key and electrical interlock systems shall be physically tested to ensure proper function.
   f. Doors, panels, and sections shall be inspected for paint, scratches, and fit.
   g. Mechanical operation of relays, switches, and other devices.

2. Electrical Tests

   a. Insulation Resistance Test: Measure insulation resistance of each bus section phase-to-phase and phase-to-ground for 1 min. Test voltage shall be 1000V. Minimum acceptable values shall be in accordance with IDOT Standard Specifications.
   b. Check automatic operation of breakers, starters and MCPs for close and trip operations from control relays and pushbutton stations.
   c. Test main, generator and transformer circuit breakers, main and low flow pump motor circuit protectors (referred to as breakers), and starters as follows:
      i. Visually inspect and check for proper mounting; proper conductor size; cracked casings; connection bolt torque level in accordance with NETA ATS, Table 100.12. Operate breaker to verify smooth operation.
      ii. Using a 1000V Megger for 480V breakers and a 500V Megger for 240V breakers, conduct electrical insulation tests, pole to pole and pole to ground with breaker open for one minute. Test values shall comply with NETA ATS Table 100.1
      iii. Measure contact resistance across each pole with breaker closed, using micro ohm meter. Also measure the contact resistance of pump starters with the contacts closed. Investigate and report deviations of 50% or more from adjacent poles and similar breakers.
      iv. Perform primary current injection test and verify long time minimum pickup and delay and instantaneous pickup of the breakers. Trip characteristics of adjustable trip breakers shall be within manufacturer's published time-current characteristic tolerance band, including adjustment factors.

C. Instrument Transformers

1. Visual and Mechanical Inspection: Inspect for physical damage and compliance with Drawings. Check mechanical clearances and proper operations of disconnecting and grounding devices associated with potential transformers. Verify proper operation of grounding or shorting devices.

2. Electrical tests: Confirm transformer polarity electrically. Verify connection at secondary CT leads by driving low current through leads and checking for this current at applicable devices.

3. Measure insulation resistance of transformer secondary and leads with 500 V megohm meter. Measure transformer primary insulation with applicable overpotential tests. Verify connection of secondary PT leads by applying low voltage to leads and checking for this voltage at applicable devices.

D. Metering and Instrumentation

1. Visual and Mechanical Inspection: Examine devices for broken parts, indication of shipping damage and wire connections. Verify meter connections in accordance with single line meter and relay diagram.

2. Electrical tests: Calibrate meters at midscale. Calibration instruments shall have precision no more than 50% of instrument being tested. Calibrate watthour meters to ½%. Verify instrument multipliers.

E. Grounding System Testing

Test completed grounding system at each location where maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells.

Measure ground resistance not less than 2 full days after last trace of precipitation, and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
Perform tests by 2 point method according to Section 9.03 of IEEE 81.

Maximum grounding resistance values are as follows:
Equipment Rated 500 kVA and less: 10 ohms
Unfenced Substations and Pad-Mounted Equipment: 5 ohms

Excessive Ground Resistance: Where resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance and to accomplish recommended work.

Report: Prepare certified test reports, of ground resistance at each test location. Include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results

F. Ground Fault Systems

1. Visual and Mechanical Inspections: Inspect for physical damage and compliance with Drawings and Specifications. Inspect neutral main bonding connection to ensure following.

Zero sequence system grounded upstream of sensor.
Ground strap systems grounded through sensing device.
Ground connection made ahead of neutral disconnect link.
Inspect control power transformer to ensure adequate capacity for system.

2. Manual operate monitor panels (if present) for following:

   Trip test.
   No trip test.
   Non-automatic reset.

3. Record proper operation and test sequence. Inspect zero sequence systems for symmetrical alignment of core balance transformers about current carrying conductors. Verify ground fault device circuit nameplate identification by actuation observation. Pickup and time delay settings shall be set in accordance with settings developed through coordination study and as approved by Engineer.

4. Electrical Tests:

   Test in accordance with manufacturer's instructions. Measure system neutral insulation resistance to ensure no shunt ground paths exist, neutral-ground disconnect link removed, neutral insulation resistance measured, and link replaced. Relay pickup current shall be determined by primary injection at sensor and circuit interrupting device operated. Relay timing shall be tested by injecting 150% and 300% of pickup current into sensor. Total trip time shall be electrically monitored.

5. Test Parameters:

   System neutral insulation shall be minimum of 100 ohms, preferably 1 megohm or larger. Relay pickup current shall be within 10% of device dial or fixed setting, and in no case greater than 1,200 amp. Relay timing shall be in accordance with manufacturer's published time-current characteristic curves, but in no case longer than 1 sec.

3.9 Final Acceptance Inspection

A. When the work is complete, tested and fully operational in accordance with IDOT Standard Specifications, and only after the Record Drawings have been reviewed and accepted by the Engineer, the Contractor shall schedule a Final Acceptance Inspection with the Engineer. The Contractor is cautioned to test for the proper operation of all equipment prior to the final acceptance inspection and to make any corrections necessary to establish proper operation. THE FINAL ACCEPTANCE INSPECTION SHALL NOT BE HELD WHILE FINAL CONNECTIONS AND CHECKS ARE BEING MADE.

B. The Final Acceptance Inspection shall be made for the complete work at the facility as a whole and shall be scheduled after full commissioning of the pump station.

C. During the course of the construction work and until final acceptance, the Contractor shall be responsible for maintenance and operational integrity of the facility.

END OF THIS SECTION 160000

SECTION 160010 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL:

1.1 Description

A. Basic materials and methods specified herein shall be incorporated in the work wherever applicable unless specifically indicated otherwise.

B. The basic materials and methods specified herein are intended to define a minimum standard of quality and workmanship.

C. Refer to Section 012000 for additional requirements.

1.2 Related Sections

A. IDOT Standard Specifications - for Cast-In-Place Concrete, Reinforcement Bars, Aggregate Base Sub-base Preparation and Excavation.

B. Section 160000 - General Electrical Provisions

C. Section 160020 - Major Electric Equipment

D. Section 160030 – Packaged Engine Generator System

1.3 References

A. Codes and Standards referred to in this Section are:

Fed. Spec. W-F-408 - Fittings for conduit, metal (rigid thick wall and thin wall)

ASTM B-3 - Specification for soft annealed copper wire

ASTM B-8 - Specification for concentric lay stranded copper conductors, hard medium, hard or soft

ASTM B-33 - Specification for tinned or soft or annealed copper wire for electrical purposes

ASTM B-189 - Specification for lead-coated and lead-alloy-coated soft copper wire for electrical purposes

ASTM D 635 - Test method for rate of burning and/or extent and time of burning of self-supporting plastics in a horizontal position

Fed. Spec. HH-I-595 - Insulation tape, electrical, pressure sensitive adhesive, plastic

Fed. Spec. WC-596 - Electrical power connectors

NEMA WD-1-1965 - General requirements for ac switches

ANSI C82.2 - Fluorescent Lamp Ballasts - Methods of Measurement.

ANSI C82.1 - Ballasts for Fluorescent Lamps.

ANSI C82.4 - Ballasts for High-Intensity-Discharge and Low-Pressure Sodium Lamps.

ANSI C2 - National Electrical Safety Code.

Fed. Spec W-P-115 - Panel, power distribution

UL 50 - Cabinets and boxes

NEMA KS1 - Enclosed and miscellaneous distribution equipment switches (600-volt maximum)

1.4 Nameplates

A. All electrical equipment and appurtenant devices shall be equipped with nameplates having designations corresponding to those on the Drawings or as otherwise directed by the Engineer. This identification requirement shall include items such as motor control centers, starters, circuit breakers, automatic transfer switches, safety switches, control stations remote from starters, panelboards and all such similar equipment.

B. Nameplates shall be a laminated composition material, engraved to produce a two-color nameplate. Embossed tape labels will not be acceptable. Unless otherwise indicated, nameplates shall be black with white letters.

C. Nameplates shall not be less than 3/32-inch thick and shall have polished surfaces on both sides and a bevel all around on the front edges. Nameplates for panels and similar equipment shall be not less than 1-1/4 by 5 inches with 1/2-inch high inscriptions. Unless otherwise indicated, other nameplates shall be not less than (3/4 by 2 inches with 3/16-inch high inscriptions.

D. Nameplates shall be attached with brass or stainless steel screws, or, where screws cannot be used, as otherwise specifically approved by the Engineer. Tapes or other pressure adhesives will not be acceptable.

E. Nameplates shall be attached to their respective equipment or device whenever space is available. Whenever space is not available, they shall be attached nearby at a location approved by the Engineer.

F. A list of all nameplates shall be submitted to the Engineer for review and approval before installation.

1.5 Wiring Identification

A. All wiring shall be identified by means of color coding and wire markers as specified herein. Circuit identification shall include all color coding requirements of the NEC, with particular attention directed to Article 210-5.

B. All wiring shall be tagged with self-sticking wire markers or other markers approved by the Engineer. The tagging shall be applied at each termination and splice. The tagging shall also be applied at other locations, where indicated on the Drawings. Designations shall include the full circuit and wire designation except for terminations at a panel for which the panel portion of the circuit designation may be omitted. Markers shall be permanent, of a size recommended by the manufacturer for the respective wire size and shall be applied as recommended by the manufacturer.

C. Unless specifically approved by the Engineer, color coding of neutral and ground wires shall be by means of colored insulation, except where bare ground wires are indicated.

D. Branch circuit wiring smaller than No. 6, from panelboards, for lighting, receptacles and similar loads shall be color coded by means of colored wire insulation. Colors shall be as selected by the Contractor but a sufficient number of colors shall be used such that wiring in common enclosures is clearly differentiated and color combinations of wiring runs are generally not repeated. Care shall be taken in the phasing of combined-neutral circuit runs. Switched legs shall be differentiated from unswitched legs of a circuit.

E. All 120/208 Volt wiring shall be color coded by using colored wire insulation as follows: Phase A: Black; Phase B: Red; Phase C: Blue; Neutral: White.

F. All 480 Volt wiring shall be color coded by using colored wire insulation as follows: Phase A: Yellow; Phase B: Brown; Phase C: Orange

G. Control circuit wiring shall be color coded by means of colored wire insulation as follows: Line: Black/Red/Blue based on Phase; Neutral: White; Ground Green; Others: Purple or colors other than Phase colors or as otherwise indicated on the drawings

H. When approved by Engineer, wire color coding may be by means of colored insulation or colored tape, applied at each termination, splice and pull box.

1.6 Submittals

A. Provide shop drawings and product data under provisions, as specified under respective sections.

1.7 Guarantee

A. Provide guarantee under provisions, as specified under respective Sections.

PART 2 - PRODUCTS:

2.1 Raceways

A. General

Unless otherwise indicated, all wiring shall be installed in raceways in an integrated system comprised of raceways, couplings, fittings, hubs, supports and the like and boxes and covers as specified elsewhere herein. Unless otherwise indicated, raceways shall be rigid steel conduit with threaded fittings and terminations as specified herein.

B. Rigid Steel Conduit

1. Rigid steel conduit shall be manufactured to conform to Federal Specification WW-C-581, NEC Article 344, ANSI C80.1, and UL labeled.
2. All surfaces, including factory-made threads shall be protected from corrosion by hot-dip or electro-galvanizing after threading. Factory threads shall be protected by plastic and caps.

C. Rigid Steel Conduit, Polyvinyl-Chloride Coated (PVC-RGS)

1. Requirements of article ” Rigid Steel Conduit “ shall apply

2. Coating: Apply minimum 40-mil, gray polyvinyl chloride (PVC) coating over exterior and apply urethane coating uniform and consistent to interior of conduit. Internal coating shall be nominal 2 mil thickness. Conduit having areas with thin or no coating, not acceptable. Protect conduit threads by urethane coating. PVC coating shall have been investigated by UL as providing primary corrosion protection for rigid metal conduit.
3. PVC exterior and urethane interior coatings applied to conduit shall afford sufficient flexibility to permit field bending without cracking or flaking at temperatures above 30˚F.
4. All conduit and fittings in the pump room, wet well and trash rack chamber shall be PVC coated rigid steel type.

D. Liquidtight Flexible Metal Conduit

1. Flexible metal conduit shall be liquid-tight flexible metal conduit as defined by NEC Article 350 and shall be UL listed for wet location use.
2. Flexible metal conduit shall have nylon-insulated throats.
3. Sizes through 1-1/4 inch shall have a built-in copper grounding conductor, UL listed as such.
4. Flexible metal conduit shall be used only for surface mounted light fixtures and vibrating equipment.
5. Flexible metal conduit runs shall be limited to a length of 3’-0”.

E. Rigid Nonmetallic Conduit

1. Rigid nonmetallic conduit shall be manufactured to conform to Federal Specification WC-1094A, NEMA TC-2 and NEC Article 352 and shall be UL listed for exposed encased and underground applications.
2. The conduit shall be "Schedule 40", unless noted otherwise on the Drawings.

F. Conduit Fittings

1. Conduit couplings, elbows and nipples shall conform to the fitting specifications corresponding to their respective conduit specifications.
2. Locknuts, bushings, reducers, conduit plugs and similar fittings shall be galvanized or cadmium plated and shall conform to Federal Specification W-F-408.
3. Conduit bodies, such as used for pulling fittings or for avoiding sharp bends shall be hot dip galvanized and shall be complete with covers having self-retaining screws. Unless otherwise indicated, conduit bodies shall be cast iron alloy or malleable iron, with gaskets and matching cast metal or malleable iron covers.
4. Insulating bushings shall be malleable iron or steel complete with plastic inserts or shall be high impact resistance plastic. They shall be UL listed with a rating not less than 150 degrees C and they shall be equipped with ground lugs where required.
5. Conduit hubs which are not integral to a box or fitting shall be malleable iron or stainless steel and shall have nylon-insulated throats, neoprene o-rings, and shall be positively grounded and watertight.
6. All conduit fittings, elbows, bushings, etc. shall match conduit material.

G. Conduit and Equipment Support Devices

1. U-Channel Systems: 16-gage stainless steel channels, Unistrut or equal, with 9/16-inch diameter holes, at a minimum of 8 inches on center, in top surface. Provide fittings and accessories that mate and match with U-channel and are of the same manufacture.

2. Expansion Anchors: Expansion anchors in concrete or masonry shall be Type 316 stainless steel.

3. Hangers: Hangers and other accessories shall be Type 316 stainless steel.

H. Junction and Pull Boxes

1. General
   a. Boxes shall be cast boxes or sheet steel boxes as indicated or specified. Each box shall be complete with a cover of the same type and material as the box except that flush-mounted sheet steel boxes for switches and receptacles shall have Type 316 satin finish stainless steel plates. Boxes shall be hot-dip galvanized. Sizes of boxes shall be not less than shown on the Drawings, and shall otherwise conform to NEC requirements as a minimum except that boxes shall not be less than 4-inches square by 2-inches deep.
   b. Cast iron boxes shall be used in all hazardous locations. Sheet steel boxes shall be used in the electrical room. Stainless steel boxes shall be used in all outdoor locations.
2. Cast Boxes
   a. Cast metal boxes shall be gray-iron alloy free from defects such as voids and shrinkage cracks, complete with covers having neoprene gaskets. Cast aluminum boxes shall not be used.
3. Stainless Steel and Sheet Steel Boxes
   a. Sheet steel boxes 29500 cubic cm (1800 cubic inches) or less shall be code gauge and boxes larger than 29500 cubic cm (1800 cubic inches) shall not be less than 12-gauge for the box and cover.
   b. Where permitted below grade elevation or in the pump room or on the exterior walls or where otherwise indicated on the Contract Drawings, they shall be fabricated of Type 316 stainless steel with gasketed stainless steel covers and stainless steel hardware.
   c. Sheet steel boxes which are 3-feet by 3-feet by 1-1/2 feet or larger in any dimension shall be reinforced via structural steel support members integral to the box. Covers for boxes of this size or larger shall be equipped with handles for ease or removal and a support lip to hold the weight of the cover during attachment and removal.
   d. Sheet steel boxes and covers, where permitted below grade for large pull boxes, shall be hot-dip galvanized after complete fabrication.

I. Expansion Fittings

1. Expansion fittings for exposed conduit shall be compatible with the respective conduit run, and, unless otherwise indicated shall permit not less than 4 inches of movement. Each fitting shall be equipped with an external grounding bonding jumper and appropriate clamps. Fitting assemblies shall be asbestos free.

2. Expansion fittings for conduit embedded in concrete or other masonry shall be of the expansion/deflection type, shall be watertight and corrosion-resistant and shall permit not less than a 3/4-inch movement in any direction. Each fitting shall be equipped with an internal grounding-bonding strap.
3. Expansion fittings for other raceways shall be as indicated or where not indicated shall be suitable for the application as approved by the Engineer.

J. Conduit Wall Seals

1. Conduit wall seals shall be used for all conduits entering concrete structure walls.
2. Conduit wall seals used in new concrete walls shall consist of oversize polyvinylchloride (PVC) coated steel sleeves with sealing assemblies at both sides of the wall. The sealing assemblies shall be cast iron alloy or malleable iron with pressure rings and neoprene sealing grommets, membrane clamp and they shall be tightened by means of hex head screws. Each wall seal shall accept multiple conduit sizes. The sealing assemblies' castings shall be hot-dip galvanized. The pressure disc shall be PVC coated stainless steel and the bolts shall be stainless steel.
3. Where concrete walls are core-drilled for conduits to pass through, conduit wall seals used in cored holes shall consist of an assembly of an oversize outside pressure disc with membrane clamp, a neoprene sealing ring and an interior pressure disc, with discs tightened by means of not less than three stainless steel socket head cup tighten screws with stainless steel washers. Pressure discs shall be PVC-coated steel.

2.2 Wire and Cable

A. General

1. The terms wire and cable as used herein and on the Drawings shall be interchangeable and shall refer to electric wire and cable conductors in conformance with the NEC.
2. Unless otherwise indicated, all wire and cable shall be insulated conductors as defined by the NEC.
3. Wire and cable shall be UL listed, new, and delivered to the site in full reels or boxes. The reels or boxes shall have tags or imprint showing the UL listing.
4. No wire size smaller than No. 12 AWG shall be used unless specifically shown.
5. Fixture wire, for branch circuit taps to lighting fixtures, shall be in conformance with NEC requirements. Temperature ratings shall be carefully coordinated with the respective lighting fixtures.
6. Unless otherwise indicated, wire and cable shall be single conductor.

B. Conductors

1. Unless otherwise specifically indicated all wire and cable shall have copper conductors conform to ASTM B-3 or ASTM B-8 with Class B stranding.
2. Conductors which are No. 8 AWG and larger shall be stranded. Conductors smaller than No. 8 AWG may be solid or stranded.
3. Conductors sized No. 8 AWG and larger shall be coated in accordance with ASTM B-33 or B-189.

C. Insulation

1. Wire and cable insulation shall be suitable for the conditions of the installation and the voltage of the respective system and, unless otherwise specifically specified, all wire and cable for system operating at 480 volts or less shall be insulated for 600 volts AC and shall be rated at not less than 90 degrees C dry and 75 degrees wet.
2. All 600-volt wire and cable sized No. 8 AWG and larger shall be UL listed as Type USE and RHH and RHW, VW-1, with insulation of heat and moisture ethylene-propylene rubber (EPR) resistant compound.
3. All 600-volt wire and cable smaller than No. 8 AWG shall be UL listed as Type THW or THWN, with insulation of heat and moisture resistant polyvinylchloride (PVC) thermoplastic and a nylon jacket or Type XHHW with insulation of cross-linked polyethylene compound, except that all such wiring on the project shall be of the same type.

D. Signal Cables

1. Signal cable (SC) shall be 2-conductor, 3-conductor or multiple assemblies of pairs or triads as indicated, and shall be UL listed Type TC cable rated not less than 600 volts AC and 90 degrees C.
2. Conductors shall be soft annealed copper, 18 AWG minimum, with 7-strand Class B stranding in conformance with ASTM B-8.
3. Pairs (2/C) or triad (3/C) cables shall be an assembly of left hand lay twisted insulated conductors, tinned copper drain wire, an overlapped conductive tape shield and a jacket overall. Conductor insulation and jacket shall be flame-retardant ethylene telraflouroethylene compound. The cable shall meet the requirements of IEEE Standard 383 and shall be rated non-burning under ASTM D635.
4. Multiple-pair or multiple triad cable shall be an assembly of individual conductor groups consisting of insulated pairs or triads plus a copper drain wire covered with an overlapped conductive tape shield bound together with an overlapped conductive shield, a drain wire and rip cord and a jacket overall. Conductor insulation shall be heat and moisture-resistant thermoplastic not less than 15 mils thick with a minimum 4-mil nylon jacket, having a UL listed temperature rating not less than 90 degrees C. Conductor insulation shall be color coded to differentiate individual conductors as well as conductor groups.

E. Telephone Cable

1. Telephone cable shall be standard multi-conductor, single line telephone cable meeting or exceeding the requirements of the local telephone utility.

2.3 Electrical Tape

A. Electrical tape shall be UL listed all weather vinyl plastic tape which is resistant to abrasion, puncture, flame, oil, acids, alkalis and weathering. It shall conform to Federal Specification HH-I-595. Thickness shall not be less than 8.5 mils and width shall not be less than 3/4-inch.

2.4 Grounding

A. All electrical systems, equipment and appurtenances shall be properly grounded in strict conformance with the NEC, even though every detail of the requirements is not specified or shown. Good ground continuity throughout the electrical raceway system shall be assured. Where connections are made to painted surfaces, the paint shall be scraped to fully expose metal at the connection point and serrated connectors or washers shall be used. Piping systems shall be grounded as well.

B. Unless otherwise indicated, grounding conductors shall be copper and shall be insulated for 600 volts.

C. Unless otherwise indicated, ground rods shall be copper-clad steel rods not less than 1-inch in diameter and 10 feet long, driven so that tops of the rods are 24 inch below finished grade. Where indicated, ground wells shall be included to permit access to the rod connections. The copper-clad steel ground rods, 1-inch in diameter, extended to 10 feet into earth. All electrical equipment, pump discharge pipes and appurtenances shall be properly grounded in compliance with this Section.

D. The copper-clad steel ground rods, 1-inch in diameter, extended to 10 feet into earth, shall be installed for new parking lot fence as shown on the Contract Drawing.

E. Unless otherwise indicated, all connections to ground rods, structural steel or fencing shall be made with exothermic welds. Where such connections are made to insulated conductors, the connection shall be wrapped with at least 4 layers of electrical tape extended 6-inches onto the conductor insulation.

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

G. The grounding system shall be fully tested. This testing shall include continuity tests of all equipment grounding and a test of the system ground via measurements using a suitable bridge or by other means approved by the Engineer.

2.5 Receptacles

A. Duplex convenience receptacles shall be premium specification grade with wide heavy wrap-around support bridge, large deep-slot terminal screws, which permit back or side wiring, heavy-walled area body and ground terminal lug. They shall conform to Federal Specification W-C-596 Style X2 and NEMA Standard WD-1-1965. Unless otherwise indicated they shall be brown, 2-pole, 3-wire, NEMA configuration 5-20R, 20-ampere and 125 volt.

B. Provide factory sealed explosion-proof convenience receptacles suitable or Class I, Group D, Division 2 installations conforming to UL 1010 and UL 884, with malleable iron single gang box, 3/4-inch hubs and cover, 125 Volt, 20-ampere, 2-pole, 3-wire. Provide mating plug for each explosion proof receptacle installed.

C. Power receptacle in the pump room shall be factory sealed explosion-proof, dead front type suitable for Class I, Division 2, Group D installation conforming to UL 1010 with malleable iron box, conduit hub and threaded cover, 600 Volts, 3-pole, 4-wire.

D. Receptacles installed outdoors or otherwise exposed to the weather shall be installed with weatherproof flap-type covers and shall be of the Ground Fault Circuit Interrupter (GFCI) type, unless otherwise indicated.

E. Ground fault circuit interrupter (GFI) receptacles: Duplex, 20-ampere, and 125 volts, feed-through type.

F. Unless otherwise indicated, receptacles shall be installed with their centers 48 inches above the finished floor.

G. Clock receptacle shall be 3-wire, 15-ampere, 125-volt with hanger and flush stainless steel plate for each clock.

H. Other receptacles shall be as shown on the Drawings.

2.6 Toggle Switches

A. Toggle switches shall be premium specification grade with large deep-slot terminal screws, silver cadmium oxide contacts and a rugged molded plastic body. The switches shall conform to Federal Specification W-S-896E, Specification Sheet W-S-896/3. Unless otherwise indicated, the switches shall be single pole single throw (SPST), 20-ampere, with brown handles, rated for 120-277 volts AC only. Toggle switches in the pump room and stairwell shall be double pole to start supply or exhaust fan in the same time when lights will be turn on in any of this area.

B. Toggle switches in locations classified as hazardous shall be factory sealed explosion-proof, dead front type suitable for Class I, Division 2, Group D installation.

C. Switches installed outdoors or otherwise exposed to the weather shall have NEMA 4 covers.

D. Other switches shall be as shown on the Drawings.

E. Unless otherwise indicated, toggle switches shall be installed with their centers 48 inches above the finished floor.

2.7 Lighting Fixtures

A. Lighting fixtures shall be as indicated on the Drawings and they shall be provided complete with lamps and all necessary fixture wire for connection.

B. LED Luminaires:

1. Materials of Construction

a. Luminaire housing shall be of die-cast low copper aluminum for corrosion resistance. Openable covers allow easy access to wiring and internal components.
b. Luminaire having optimized, maintained thermal management system by appropriate heat sink ensuring guaranteed L70 lamp life at 55°C operating ambient.
c. Quality Assurance: UL 1598A, UL 8750, CSA 22.2 No. 250.0 compliant. In addition, the luminaires in the pump room shall be listed for use in Class I Division 2, Groups C & D locations, UL 844 and CSA 22.2 No. 138 MB1 compliant.
d. Luminaires shall be gasketed and suitable for wet locations. Fixture designed to prevent permanent deformation / distortion of the gasket assuring long life sealing integrity of the housing.

e. The optical system shall consist of LED metal core board (light engine), and internal specular reflector.
f. The optical system shall have a Luminaire Dirt Depreciation of at least 95%. The light transmitting material shall not degrade due to temperature / UV exposure. Unit shall provide a symmetric distribution at average 5000K +/-250K CCT, unless specified otherwise, or as published by manufacturer for corresponding fixture. Luminaire shall provide fixture lumens per manufacturer published data with +/-5% allowable variation when tested in accordance with LM-79.
g. The luminaire enclosure shall have Protection Rating as defined by IEC 60529 of at least IP 66 and NEMA 4X.
h. The minimum color rendering index (CRI) is 70 +/-5%.
i. Power factor shall be greater than 0.9.
j. THD shall be less than 20%.
k. Luminaire shall be rated for use in -40 deg F to +149 deg F environment

2. Photometrics: Photometrics shall be submitted for approval.

3. The luminaire must pass a vibration test according to the seismic requirements of the geographical location of the site.

4. The luminaire shall be finished with a polyester powder paint of shade, selected by the owner, applied after a pretreatment process to ensure maximum durability and has a polycarbonate lens. The luminaire material and finish shall be suitable to withstand corrosive environment, including presence of H2S gas, typical of wastewater treatment plant.

5. Luminaire mounting shall provide mounting options to allow for Pendant, Wall, Stanchion, and Ceiling applications when used in conjunction with the Arm Accessory. All mounting shall be rated IP66.

6. Provide minimum five year (or 50,000 operating hours) warranty on LED light engine, drivers and non-electrical components.

7. Luminaires shall operate on a 120 volts supply.

2.8 Panelboards

A. Panelboards shall be in conformance with the NEC shall be UL listed and shall conform to Federal Specification W-P-115b.

B. Panelboards shall be of dead-front construction, providing access to the wiring compartment without exposing bus.

C. Boxes (tubs) shall be code gauge galvanized steel with ample wiring space and knockouts all in conformance with UL 50. Fronts shall be code-gauge steel with a hinged door and a cylinder lock. The front shall have a gray finish over a rust inhibitor. The interior of the door shall have a circuit directory in a frame with a clear plastic cover. Boxes and fronts shall be suitable for surface or flush mounting as indicated and where no other indication in made, panels shall be surface mounted.

D. Unless otherwise indicated, phase bus bars may be copper or aluminum, sized as shown or as required by UL standards, whichever is larger. Neutral shall have a solid bar with a separate connector for each pole of panelboard branch circuit space. Phase bus shall be for bolt-on branch circuit breakers. A ground bar shall be provided for all panels.

E. Unless otherwise specifically indicated, each panelboard shall be provided with a main breaker sized at the panel bus rating.

F. Unless otherwise indicated, branch circuits shall be arranged in parallel vertical rows with alternate phasing. Branch circuit protective devices shall be bolted-on circuit breakers unless otherwise indicated and these devices shall be interchangeable and removable without disturbing adjacent devices.

G. Panelboards operating at 208 volts phase-to-phase or less shall be rated at 208 volts AC with circuit breakers rated at 208 volts AC and, unless otherwise indicated, these circuit breakers shall have UL listed interrupting rating of not less than 22,000 RMS symmetrical amperes at 208 volts.

H. Circuit breakers shall be molded case type, bolt-on, with trip-free handles and visual trip indicators. Circuit breakers shall have provisions to lock out and tag out.

I. Panelboards shall be grounded per the NEC requirements.

2.9 Safety Switches

A. Safety switches shall be heavy-duty type, UL listed as suitable for use as service entrance equipment and shall be in conformance with NEMA Standard KS1-1983 for type HD switches and Federal Specification WS-865c for heavy-duty switches. Switches used as service entrance equipment shall have a factory-installed solid neutral and other switches shall have a factory-installed grounding kit unless otherwise indicated.

B. The switches shall have a quick-make, quick-break mechanism, full cover interlock to prevent opening the cover with the switch in the closed position and a position-indicating operating handle. The operating handle shall be well insulated from the current carrying parts of the switch.

C. Unless otherwise indicated, switches shall be rated 600 volts, and when used with UL listed Class R fuses, shall have a UL listed short circuit withstand rating of 200,000 RMS symmetrical amperes.

D. Unless otherwise indicated, safety switches shall be 3-pole.

E. Unless otherwise indicated, safety switches shall be 30 amperes minimum.

F. Unless otherwise indicated, DPST auxiliary contacts shall be provided to break the control circuit, when the disconnect is open.

G. Unless otherwise indicated, safety switches shall be un-fused. Where fused switches are indicated, they shall be provided complete with UL Class K-5 current limiting fuses.

H. Unless otherwise indicated, safety switches installed below grade or exposed to the weather shall have NEMA 4X stainless steel enclosures. Safety switches installed indoors above grade shall have NEMA 12 enclosures. Safety switches in explosion-proof hazardous locations shall be in enclosures suitable for Class I, Division 2, Group D installation.

2.10 Manual Motor Starter Switches

A. Manual motor starter switches shall be complete with melting alloy type thermal overload protection that shall be trip-free and resettable. The exact size of the overload element shall be coordinated for the specific respective motor.

B. The switches shall be rated not less than 1 horsepower at 115 and 230 volts single phase. The switches shall be single pole unless otherwise indicated.

C. Where indicated, the switches shall be equipped with a pilot light and/or a hand-off-automatic selector switch.

D. Unless otherwise indicated, the manual motor starter switches shall be equipped with NEMA 4 cast enclosure. Switches that are flush mounted shall be mounted with the flush box and shall have a suitable flush-mount plate. Switches in explosion-proof hazardous locations shall be in enclosures suitable for Class I, Division 2, Group D installation.

2.11 Circuit Breakers

A. This specification shall apply to all circuit breakers furnished under this Division which are not integral to panelboards or motor control center equipment.

B. Circuit breakers shall be UL listed, molded case, thermal-magnetic, manually operated circuit breakers of the trip ratings shown or indicated.

C. Unless otherwise indicated, circuit breakers shall be 3-pole.

D. Unless otherwise indicated, circuit breakers shall be rated for use on 480 volt circuits.

E. Multi-pole circuit breakers shall have a common trip and single operating handles. Handles shall be trip free. Circuit breakers in 250 ampere frames and above shall have an adjustable magnetic trip setting.

F. The circuit breakers shall indicate "ON", "OFF", and "TRIPPED" conditions.

G. Unless otherwise indicated, circuit breakers shall have a UL listed interrupting rating of not less than 25,000 RMS symmetrical amperes at 480 volts.

H. Unless otherwise indicated, circuit breakers installed below grade or exposed to the weather shall have NEMA 4 stainless steel enclosures and circuit breakers installed indoors above grade shall have NEMA 12 enclosures. Circuit breakers in hazardous locations shall be in enclosures suitable for Class I, Division 2, Group D installation. All circuit breakers shall have external position-indicating operating lever handles with padlock provisions.

I. Where indicated or where required for indicated functions, circuit breakers shall be equipped with accessories such as shunt trips, auxiliary switches, and under voltage release.

2.12 Motor Starters

A. This specification shall apply to all motor starters that are provided under this Division which are not integral to motor control center equipment.

B. Unless otherwise indicated, motor starters shall be of the combination type with integral motor circuit short circuit protection mounted in a common enclosure with the starter and control components for control of circuit as indicated. Unless otherwise indicated, motor circuit short circuit protection shall be motor circuit protectors. Motor circuit protectors shall be manually operated and shall have a magnetic trip level adjustment. Trip ratings shown on the Drawings are approximate and the trip rating provided shall be as recommended by the device manufacturer for the characteristics of each respective motor. The contractor shall coordinate device selection with motors provided under other Divisions.

C. Motor starters shall not be smaller than NEMA Size 1.

D. As a minimum, each starter shall be equipped with two normally open (N.O.) and two normally closed auxiliary contacts in addition to a starter seal-in (holding) contact. Unused contacts shall be spare.

E. Unless otherwise indicated, control circuits shall operate at 120 volt derived from a control transformer integral to the combination starter. The control transformer shall have a fused secondary and shall be sized adequately for the starter and all connected control devices but in no case shall the transformer be sized less than 50 volt-amperes over the capacity required to operate the starter.

F. Control Devices shall be as specified elsewhere herein or as indicated on the Drawings.

G. Unless otherwise indicated, motor starters installed below grade or exposed to the weather shall have NEMA 4 stainless steel enclosures, motor starters installed indoors above grade shall have NEMA 12 enclosures, and motor starters in hazardous locations shall be in enclosures suitable for Class I, Division 2, Group D installation. The units shall be complete with position-indicating operating handles, for the short circuit protective device, with handle padlock provisions.

2.13 Control Devices

A. Control devices shall be provided as part of motor starters, and also for control stations remote from motor starters and as otherwise indicated.

B. Unless otherwise specifically indicated, pushbuttons, selector switches, indicating lights and other control devices shall be of the heavy-duty oil tight type.

C. Contact blocks for pushbuttons and selector switches shall have not less than one double pole double throw (DPDT) contact.

D. Indicating lights shall have built-in transformers, LED lamps and lenses of the colors indicated. Unless otherwise indicated, indicating lights shall be push-to-test type.

E. Legend plates shall be provided on all oil tight control devices. Unless otherwise indicated, green indicating lights shall have "RUNNING" legend plates and legend plates for other indicating lights shall be as indicated or as selected by the Engineer.

F. Unless otherwise indicated, enclosures for control stations (control devices which are remote from motor starters or other equipment) which are located below grade or exposed to the weather shall be NEMA 4 stainless steel, enclosures for control stations located indoors above grade shall be NEMA 12. The enclosures for control stations located in hazardous locations shall be suitable for Class I, Division 2, Group D installation.

G. Thermostats

1. Supply air fan in MCC room and exhaust air fan in Pump room shall be controlled by 2-position type electric thermostats. When the thermostat senses a temperature 24 degrees C (85 F) (adjustable) or higher, the thermostat shall energize fan control circuits located in the Control Panel. Upon a drop in temperature below 24 degrees C (85 F), the fans shall stop.
2. Electric thermostats shall have bimetallic sensing elements and concealed adjustable set point. Electric thermostats shall have field adjustable sensitivity and be furnished with thermometers in stainless steel covers. Electric thermostats located in hazardous area shall be suitable for Class I, Division 2, Group D locations. Electric thermostats located in the Electrical Room shall have NEMA 12 enclosures.

2.14 Electric Unit Heaters

A. General

1. Electric unit heaters with their corresponding thermostats control and mounting brackets shall be provided and installed at the locations shown on the drawing.
2. Heaters shall be provided with heavy-duty magnetic control contactor except shown otherwise on the Plans.
3. Electric unit heaters shall be the type and have the capacity and electric characteristics indicated. If current other than that indicated is required, transforming devices shall be provided with the unit heaters. Fan motors shall be wired internally to the heater power supply.
4. Units shall be horizontal type as shown and be UL approved and bear the UL label. Units shall meet all requirements of the NEC.
5. Heaters shall have automatic reset thermal cutout overheat protection control with bulbs or capillary tubes located in the air stream. Overheat protection controls shall interrupt the heater load supply directly or by independent contractors connected to the thermal cutout only. Integral delay type thermostats or relays shall allow the fans to continue to run after the heating elements are off until the heat is dissipated. Where designated or required, delay thermostats shall prevent the fans from starting until the elements have warmed up.
6. Heating elements shall be non-glow, metal sheath finned tube type. They are shockproof. Heat radiation fins are corrosion resistant copper clad steel, furnace brazed to the tubular heating elements for good heat transfer.
7. Unit heaters shall be controlled by remote wall mounted, snap action thermostats. Thermostats shall have internal sensing elements and thermometers on cover and manually adjustable set points and differentials with a set point range of approximately 4 degrees C (40 degrees F) - 27 degrees C (80 degrees F) and a differential of 2 degrees C (3 degrees F).

8. Horizontal unit heaters shall be provided with factory made brackets for wall mounting as indicated. Brackets shall be complete with necessary fasteners, bolts, lock washers, cutter pins, and supports.
9. Adjustable louvers shall be provided on the discharge side to direct airflow. Resistance coils shall be located on the discharge side of fans on horizontal units. Fan motors shall be located out of the air stream and separated from it by separator plates.
10. Fans shall be broad bladed, non-sparking, all aluminum propeller type, with high efficiency and quiet operation, directly connected to motors and dynamically balanced with the motors. Motors shall be continuous heavy duty, totally enclosed, with sleeves, roller or ball bearings, built-in automatic reset, thermal overload protection, and designed for use with unit heaters. Fans and motors shall be resiliently mounted to prevent vibration and be provided with welded wire, or equal, removable fan guards.
11. Heating elements and entire units shall be enclosed in steel housing, bonderized and furnished with baked on enamel.
12. Unit heater shall be installed in accordance with the manufacturer's recommendations.

B. Unit Heaters in Non-Hazardous Locations

1. Each unit heater shall have integral mounted magnetic contactors, fused control power transformer, thermal cutouts, fan delay relay and remote wall-mounted thermostat. The unit heater shall be pre-wired, except of electrical service. Internal wiring shall extend to terminal blocks clearly marked. Service wire terminals for field connections shall be numbered.

C. Unit Heaters in Hazardous Locations

1. Unit Heaters in hazardous area shall meet UL requirements for Class I, Division 2, Group D classification for hazardous locations.
2. Each Unit heater shall have integral thermal cutouts and fan delay relay. The devices inside unit heater shall be pre-wired, except those require field connections shall be wired to terminal blocks with wire numbers clearly marked for external connections.
3. Each heater shall be furnished with remote wall mounted power disconnect switch and thermostat in explosion proof enclosure for field installation. Each heater shall have pre-wired, self-contained control center in an explosion proof enclosure.

2.15 Fire Alarm System

A. The fire alarm system shall include contact outputs for remote connection to the Intrusion Alarm Panel as shown on drawings.

B. The system shall be complete with two zones: the pump room, and the Electrical room. Notification and initiating devices shall be provided as indicated on the Contract Drawings. The smoke detectors shall be of photoelectric type. The smoke detectors in hazardous area shall meet UL requirements for Class I, Division 2, Group D classification for hazardous locations. All devices install shall be from the same manufacturer.

C. Submittal information shall include all necessary wiring diagrams and installation requirements

D. Complete installation shall be within guidelines of latest versions of ICBO, BOCA, SBCCI, IBC, IFC, and IMC.

E. The system shall be the product of a single manufacturer having local available service. The system shall be UL listed and Factory Mutual approved. Fire alarm system shall be manufactured by ISO 9001 certified company and meet requirements of BS EN9001: ANSI/ASQC Q9001. Fire alarm control panel shall meet UL 864 (control units).

F. Contractor shall have a minimum of 5 years documented fire alarm installations and must be able to provide parts and labor to expand system specified, if so requested for period of 5 years from date of acceptance.

G. Fire Alarm system shall indicate a fire; provide identifiable visual alarms with remote annunciator back up. Relay outputs for alarms shall be provided for transmitting an alarm to Intrusion Alarm system.

H. Complete installation shall conform to latest edition of applicable sections of NFPA 12B, 13, 13A, 15, 16, 17, 17A, 70, 70E, 71, 72, 90A, 101, and state and local building codes and requirements.

I. All system components and programming thereof shall be provided by contractor. Contractor is responsible to comply with state and local codes for installation of the system. At a minimum, the system shall meet NFPA 72 and the International Fire Code (IFC).

J. The system shall include a Digital Alarm Communicator Transmitter (DACT) and it shall accept two plain old telephone service (POTS) lines for primary and secondary communication channels.

K. Notification Devices

1. Photoelectric smoke detectors:
    a. Type: 2% light obscuration sensing, twist-lock base, LED source and silicon photodiode target, alarm LED, 360° smoke entry with insect screen, magnetic test switch.
    b. Power supply: 24 volts dc, 2 wire from fire alarm control panel.
    c. Each detector shall have on-board microprocessor that evaluates its photoelectric light scattering chamber activity and makes intelligent decision based upon light obscuration history as to whether alarm condition is present.
    d. Standards: UL 268 listed, FM-approved.

2. Heat Detectors
    a. They shall be combination rate of rise/fixed temperature heat detectors, 135^0F rating.
    b. Power supply: 24 volts dc, 2 wire from fire alarm control panel.
    c. The detector shall be hermetically sealed, shock resistant, corrosion resistant and tamper-proof.
    d. Standards: UL S539 listed, FM-approved.

3. Manual pull stations:
    a. Type: Noncoded, double-action, push/pull. Breakglass type not acceptable.
    b. Operation: Spring-loaded interference plate (marked “PUSH”) shall be pushed back to access pull lever. Firm downward pull shall activate alarm switch.
    c. Mounting: Surface or semi-recessed, as shown in Plans.
    d. Key lock test and reset.
    e. Construction: Lexan or cast aluminum, red satin baked enamel, white lettering.
    f. Enclosure to suit environment.
    g. Key to match control panel.
    h. Standards: UL 38 listed, FM-approved

L. Initiating Devices

1. Audio/visual alarm indicating appliance:
    a. Common enclosure for fire alarm audible and visual alarm devices. Visual portion of device shall be fully synchronized solid-state Xenon flashtube and shall meet requirements of ADA and UL Standard 1971.
    b. 15, 30, 75 and 110 candela models shall be available, with models rated 15/75 on axial.
    c. Design to accommodate speaker, horn, bell, or chime.
    d. T-tapping of signal device conductors to signal circuit conductors not acceptable.
    e. Front panel or bezel may be inverted so Xenon strobe is below audible device.
    f. Power supply: 24-volts dc from fire alarm control panel or NAC panel.
    g. Standards: UL-listed, FM-approved and meeting ADA requirements.

2.16 Intrusion Alarm System

A. New Intrusion Alarm System shall be provided in the control room. All inputs/outputs shall be provided for a complete and operational system.

B. An Intrusion Alarm System shall be provided as generally shown on the drawings and specified herein for the purposes of detecting unauthorized entry into the pump station along with communicating various indicated alarms. All required input alarms shall be communicated via telephone output to the designated destination.

C. The system shall consist of a new NEMA 12 wall mounted panel with lockable hinged door, 120V - 12V transformer, DC power supply with battery and battery charger, digital dialer, a transmit LED, a 6 volt control relay, alarm buzzer, magnetic reed switches at the entry doors, a key operated alarm override switch at the main entry door with LED and other appurtenances in the Intrusion Alarm Panel as indicated or required.

D. The magnetic reed switches shall consist of two elements, the magnet which mounts to the interior face of the door and the magnetically operated reed switch which mounts to the door frame. The switch contacts shall be closed when the door is open and open when the door is closed.

E. A keypad shall be provided inside the electrical room near the entrance to arm and disarm the alarm with a pass code.

F. A submittal for the Intrusion Alarm Panel showing the layout of the intrusion alarm system devices and complete point to point wiring diagram shall be provided.

G. The panel shall operate on 120V, 60 Hz input.

2.17 Time Switches

A. Time switches, unless otherwise noted, for the control of lighting or other functions shall be equipped with astronomical dials based on the latitude of the site. The switches shall be digital solid state. Each switch shall have a reserve power feature to provide continuous operation during loss of power, with not less than 16 hour capacity. The reserve power feature shall not require periodic battery replacement. Output contacts shall be double pole single throw normally open (DPST-NO), unless otherwise indicated and shall be rated not less than 40 amperes per pole at 277 volts. Unless otherwise indicated, switches shall be for operation on 120 volts. Provide a flush NEMA 1 enclosure with a gray finish similar to panelboards.

2.18 Electric Motors

A. This section outlines the requirements for electric motors as specified with equipment furnished under other Divisions.

B. Provide all submittals, including the following, and as specified in Section 012000.

1. Provide manufacturer's catalog data for each motor.
2. Provide shop drawings for each motor detailing arrangement, wiring, conduit boxes, and motor application.
3. Provide certified standard commercial test reports for all motors.

C. Motor Requirements

1. Design all polyphase motors for high energy efficiency and high power factor operation.
2. Provide motor nameplate horsepower as specified for the driven equipment.
3. Provide motors to operate continuously over the entire load range of the driven equipment without loading motor in excess of nameplate rating and its specified temperature limit.
4. Provide squirrel cage induction motors for 373 watts (1/2 hp) and larger operating at 460 volts, 3-phase, 60-hertz.
5. Provide 115-volt, single phase, 60-hertz motors less than 373 watts (1/2 hp).
6. Design motors to be suitable for continuous operation with a line voltage variation within ±10-percent of rated voltage.
7. Rate motors for continuous operation in 40 degrees C ambient.

D. Provide motors with the following mechanical protection.

1. Dry, clean and well ventilated areas: Provide open drip-proof motors.
2. Wet, damp or dusty areas: Provide totally enclosed, fan-cooled motors with removable drain plug.
3. Class I, Division 2 Area: Provide totally enclosed fan-cooled explosion-proof motor.
4. Submersible Locations: Provide a completely sealed submersible motor suitable for operation in a hazardous location.

E. Make conduit box NEMA enclosure ratings compatible with motor enclosures.

F. Provide NEMA Design B, unless otherwise specified with NEMA Class F moisture resistant insulation and NEMA Class B, 80 degrees C temperature rise at rated nameplate load.

G. Use antifriction ball or roller type bearings at manufacturer's option, unless otherwise specified.

H. Use regreaseable bearings with support side thrust loadings, with a AFBMA B-10 bearing life rated at least 100,000 hours, based on a reliability of 90 percent in accordance with ANSI B3.15.

I. Provide 1.15 service factor unless otherwise specified. Where motors with a 1.0 service factor are furnished, provide motors rated at least 15 percent greater than required brake kilowatts (horsepower).

J. Provide steady state shaft loading not to exceed 100 percent of full load rating under maximum load, excluding the service factor, unless otherwise specified.

K. Provide breakdown torque of 200 percent or more of motor full load torque. Provide locked rotor torque of 80 percent or more of motor full load torque.

L. Provide slide rails and sole plates as required for proper installation.

M. Provide capacitor or open split phase start, for smaller than 373 watts (1/2 hp) motors unless otherwise specified.

N. Provide horizontal or vertical squirrel cage induction motors for continuous duty with full voltage starting except as otherwise specified.

O. Provide motor having efficiency meeting the requirements of NEMA MG1-12.55.

P. Provide motor winding temperature switches or thermal devices as specified.

2.19 Telephone

A. Telephone and communication conduit systems shall have separate junction boxes and pull fittings.

B. Outlet boxes for wall concealed telephone and signaling systems shall be 4” (100 mm) square by 1-1/2”(38 mm) deep, minimum. Furnish with plaster ring and cover plate.

PART 3 - EXECUTION:

3.1 Raceway Installation

A. General

1. Except where otherwise indicated or specified, raceways in outdoor exposed applications shall be PVC coated rigid steel and other exposed raceways shall be rigid steel conduit.
2. No conduit smaller than 19mm (3/4-inch) diameter trade size shall be used unless specifically indicated. Wherever no conduit size is shown on the Drawings, the conduit size shall be taken to be 19mm (3/4-inch) diameter.

3. Conduit runs shall have no more than 270 degrees of bends (the equivalent of three 90degree bends) between pull points. Bends shall be long radius type unless specifically approved by the Engineer. Bends may be either factory-made bends or field bends using suitable bending apparatus.
4. Other raceways may be supported by trapeze or other hangers approved by the Engineer. Trapeze hangers shall be hot-dip galvanized steel channels or stainless steel channels except that in the wet pit atmosphere, below grade. Stainless steel shall be used with conduits held in place with heavy-duty U-bolts, nuts and lock washers. Trapeze hangers shall be hang using threaded galvanized or stainless steel rods not less than 3/8-inch diameter and appropriate anchors or by other means approved by the Engineer.
5. Threaded raceway joints shall be made with a conductive compound applied to the male threads. Threads shall be made to avoid butting and to avoid exposed threads. In no case will running threads be allowed.
6. Conduit reducers shall be provided as required for conduit terminations at equipment.
7. Unless otherwise indicated, conduits terminating at cast or malleable iron boxes or in sheet steel boxes below grade shall be terminated in conduit hubs. Hubs may be integral to the box or may be installed separately. Non-integral hubs or integral hubs which do not provide a flared, smooth entry shall not be used where conductors are 21 square mm (No. 4 AWG) or larger, in compliance with NEC Article 373-6(c), and in these cases two locknuts and an insulating bushing shall be used.
8. Threaded conduits terminating at sheet metal boxes or enclosures above grade, or where bushings cannot be brought into firm contact with the box or enclosure or where insulating bushings are required by the NEC, shall terminate with two locknuts and an insulating bushing. Conduit bushings constructed wholly of an insulating material shall not be used to secure a raceway.
9. Expansion fittings, as specified herein, shall be installed in all raceway runs crossing structural expansion joints. The structural, architectural and electrical drawings shall be examined to determine complete extent of expansion joints.

B. Exposed Raceways

1. Unless otherwise indicated, exposed raceways shall be run straight, parallel to walls and floors except those conduits shall be pitched slightly to drain to the nearest box or fitting wherever possible. Exposed runs shall be grouped together as much as possible.

C. Embedded Raceways

1. Raceway runs installed embedded in concrete or masonry must be approved by the Engineer and shall be installed in a way that will not detract from the structural integrity or watertightness of the structure.
   a. The raceways shall be placed in the approximate center of walls, floors, etc. The location of raceways within poured concrete shall be maintained by the use of spacers designed for the purpose. Raceways in poured concrete shall not be in contact with reinforcing steel. Concrete and rebar shall conform to IDOT Standard Specifications and ACI 318.
   b. Concrete-tight split couplings may be used in lieu of union type couplings for conduit embedded in poured concrete. The couplings shall be installed tight to assure good metal-to-metal continuity.

c. Raceways installed below slabs on grade shall be encased in not less than 3-inches of concrete all around. The concrete shall be monolithic with the floor slab and shall be tied to the floor slab with reinforcing steel as per floor slab construction.

D. Underground Raceway Installation

1. Unless otherwise indicated, conduit runs installed underground shall be rigid non-metallic conduit as specified encased in concrete. This shall not be taken to include conduit pushed or installed in trench to facilitate wiring of roadway lighting, which shall be as otherwise indicated or specified.
2. Underground conduit runs for electric utility service entrance cables shall be rigid steel conduits as specified, unless specifically required by the utility.
3. Underground raceways, encased in concrete, shall have steel reinforcing where installed below roadway or other paved vehicle areas and the reinforcement shall extend not less than 1500 mm (5 feet) additional from the edge of pavement unless otherwise indicated. Steel reinforcing shall also be provided where otherwise indicated. The concrete encasement shall comply with IDOT Standard Specifications.
4. Underground concrete-encased raceways shall be supported on plastic spacers specifically designed for the purpose spaced along the length of the run as recommended by the manufacturer. Spacing between raceways within a common duct bank shall be not less than 50 mm (2 inches) and concrete cover overall shall be not less than 75 mm (3 inches) on all outside faces of the encased run. Care shall be exercised during concrete placement to assure that these are no voids and that spacers are undisturbed so that conduit spacing is maintained.
5. Unless otherwise indicated, underground raceways shall be installed not less than 900 mm (36 inches) below grade and they shall be pitched to drain to the nearest manhole or handhole as applicable and shall generally be pitched away from structures. Underground raceway runs shall be placed to avoid interference with underground piping and utilities.
6. Underground raceways entering structures shall be sealed with duct seal or other similar material approved by the Engineer.
7. Raceways shall be protected from mechanical and corrosion damage during construction. Open ends shall be capped or fitted with plugs. Before cables are installed, raceways shall be cleared of all obstruction, moisture and burrs or rough edges. Conduits that have had mud, dirt or water inside shall be cleaned with a dry swab.

E. Wall Seals

1. Unless otherwise indicated, conduit wall seals as specified herein shall be provided in all conduit runs penetrating exterior walls below grade. Handholes and manholes shall not have wall seals.

F. Flexible Conduit

1. Unless otherwise indicated all flexible conduit shall be liquid-tight flexible metal conduit as specified herein.

2. Flexible conduit shall be used for raceway terminations where vibration will be present, such as at motors, limit switches, electric damper motors, solenoid valves and the like and the length of these flexible conduit terminations shall not exceed 900 mm (3 feet).
3. All fittings used with flexible conduit shall be suitable for the conduit in conformance with the conduit manufacturer's requirements.
4. Flexible conduits larger than 32 mm (1-1/4-inch) trade size shall be installed complete with an external bare copper grounding conductor complete with suitable terminating fittings at each end.
5. Flexible conduits used in Class I Division 2 shall be listed for use in the area.

G. Support of Raceways

1. The raceway installation shall include all raceway supports and anchors as required and as specified herein.
2. Inserts in poured concrete used for the support of raceways shall be provided under this Division.
3. Excavation, subbase preparation, aggregate base, reinforcing bars and concrete for concrete encased raceways shall comply with IDOT Standard Specifications.
4. Unless otherwise indicated or specified, surface-mounted conduits shall be held in place by one-hole clamps and clamp backs. Conduits that are mounted to steel beams or columns shall be held in place by suitable beam clamps. Clamps, clamp backs and beam clamps shall be of electroplated malleable iron.
5. Other raceways shall be supported by trapeze or other hangers approved by the Engineer. Trapeze hangers shall be hot-dip galvanized steel channels or angle irons with conduits held in place by heavy-duty U-bolts, nuts and lock washers. Trapeze hangers shall be hung using threaded galvanized or stainless steel rods not less than 10mm (3/8-inch) diameter and appropriate anchors or by other means approved by the Engineer.
6. Raceways shall be supported from the structure and shall not be supported from piping, ductwork or equipment. The use of wire, chain, perforated straps and hangers designed for the support of piping will not be permitted.
7. Fasteners for the support of raceways, for the attachment to the structure shall be as specified herein.
8. Spacing of raceway supports shall be in conformance with NEC requirements for the respective type of raceway.

H. Junction and Pull Boxes

1. Raceway runs shall include junction boxes and pull boxes indicated on the Drawings and shall also include all junction boxes, pull boxes and conduit fittings required to facilitate the installation.
2. Unless otherwise indicated, all boxes that are less than 1800 cubic inches shall be cast boxes.
3. Boxes installed concealed in masonry walls (not poured concrete) above grade may be sheet steel, square-corner type with suitable matching covers.
4. Boxes, which are exposed to the weather, shall be NEMA 4X, Stainless Steel, unless noted otherwise.
5. Boxes in which multiple devices are installed shall be multi-gang boxes sized such that one gang of box space is allocated for each device.

6. Boxes which are surface mounted below grade and other boxes, where indicated, shall be mounted on spacers to provide not less than 10 mm (3/8-inch) of space between the box and the wall.
7. Boxes, housing switches, circuit breakers and make-and-break contacts of pushbuttons etc., as described in NEC Articles 501.105 (B) 1, 501.115 (B) (1) and 501.150 (B) (1), in Pump Room, Trashrack Chamber and Wet Well shall be explosion proof and listed for use in Class I Division 2 locations and where shown.

3.2 Fasteners

A. Fasteners used to mount conduit supports, panels and other items attached to the structure shall be suitable for the weight supported and shall be compatible with the structure material, i.e., wood screws shall be used for wood, toggle bolts shall be used for hollow masonry, expansion bolts or power-set studs shall be used for solid masonry or concrete and clamps shall be used for structural steel.

B. Expansion anchors shall not be less than 6mm (1/4-inch) trade size and shall extend at least 50 mm (2 inches) into the masonry or concrete.

C. Power-set anchors shall not be less than 6mm (1/4-inch) trade size and they shall extend at least 32 mm (1-1/4 inches) into masonry or concrete.

3.3 Wire and Cable Installation

A. Wires and cables shall be carefully installed to avoid damage to insulation and cable jackets.

B. Wire lubricant shall be used when pulling wires into conduits. The lubricant shall be non-injurious to conduits, conductors, insulation or jackets and the lubricant shall be UL listed. Documentation shall be submitted to confirm suitability of the lubricant for the cables used on the project.

C. Each run of cable shall have sufficient slack.

D. Where a number of wires are trained through a box, manhole or handhole, they shall be grouped by circuit where applicable and bundled using appropriate cable ties and supported to minimize pressure or strain on cable insulation.

E. Wire and cable shall not be bent to a radius less than the manufacturer's recommended bending radius, either in permanent placement or during installation.

F. Cable pulling apparatus shall have no sharp edges or protrusions that could damage cables or raceways.

G. Power, control and instrumentation shall be installed in separate raceways.

3.4 Splicing Electrical Cables

A. Any splicing for circuits other than lighting and receptacle branch circuits shall be approved by the Engineer in writing or must be shown in the drawings. When approved, splices in electrical cables shall be made with materials that are compatible with conductors, insulation and any jackets of the associated cables.

B. Unless otherwise indicated, splices shall be made using compression type copper sleeves of the size and configuration required for the splice involved. The sleeves shall be made of tin-plated copper and shall be UL listed. The sleeves shall be installed with tools and methods recommended by the sleeve manufacturer.

C. Splices in branch circuits for interior lighting and receptacles operating at 240 volts or less may be made with screw-on spring pressure connectors (solderless). The connectors shall be suitable for the wire sizes involved. Springs shall be zinc-coated steel and shall be contained in a plastic insulated housing such that the ends of the conductors will not cut through the spring and housing. Splices shall be well made pigtail splices that are mechanically secure before the connector is installed and conductors shall not be exposed beyond the connector skirt.

D. No splices shall be made in manholes, handholes or other similar locations.

E. All non-waterproof splices, including screw-on pressure connectors, shall be wrapped with not less than 3 wraps of half-lapped electrical tape.

3.5 Excavation and Backfill

A. Excavation and backfill for work under this Division shall be provided under this Division in conformance with IDOT Standard Specifications.

3.6 Concrete

A. Concrete for equipment pads, conduit encasement, handholes, manholes and other work under this Division shall be provided under this Division in conformance with Section 503 of IDOT Standard Specifications.

3.7 Cutting and Patching

A. All cutting and patching of building materials required for work under this Division shall be provided under this Division.

B. No structural members shall be removed, cut or otherwise modified without approval of the Engineer and any such work shall be done in a manner as directed by the Engineer.

C. Holes made in concrete shall be made using a suitable core drill. The use of a star drill or air hammer will not be permitted.

D. Sleeves, chases, inserts and the like required for work under this Division shall be provided under this Division and the furnishing and placement of these items shall be fully coordinated with the other trades involved so as not to delay the new construction.

3.8 Hazardous Areas

A. The following areas are designed as Class I, Division 2, Group D hazardous areas as defined by the NEC, in accordance with NFPA 829.

1. Pump Room
2. Wet Well
3. Trash Rack Chamber

END OF THIS SECTION 160010

SECTION 160020 - MAJOR ELECTRICAL EQUIPMENT

PART 1 - GENERAL:

1.1 Description

A. Major electrical equipment shall be the items of equipment specified herein.

B. The manufacturer of each specified item shall provide not less than four (4) hard-cover operation and maintenance manuals for the respective equipment item furnished. The manuals shall contain final, approved shop drawings and product data sheets (including any field additions or modifications), as well as recommended installation, testing, operation and maintenance procedures.

C. The manufacturer shall provide one set of any special tools, as applicable, required for the maintenance of the equipment, housed in a metal toolbox.

D. Equipment furnished under this section shall be complete with anchor bolts and associated hardware required to anchor equipment to concrete. Anchor bolts and all hardware shall be galvanized steel.

E. For each specified item, a representative of the manufacturer shall check the installation and submit, to the Engineer, three (3) certified, signed statements, addressed to the Engineer, that the equipment has been properly installed and is in good working order.

1.2 Related Sections

A. Section 160000 - General Electrical Provisions

B. Section 160010 - Basic Electrical Materials and Methods

C. Section 160030 – Packaged Engine Generator System

1.3 References

A. Codes and Standards referred to in this Section are:

1. NEMA ICS-1 General Standards for Industrial Control and Systems
2. UL 845 Motor Control Centers
3. ISA Standards and Recommended Practices for Instrumentation and Control

1.4 Submittals

A. Provide shop drawings and product data as specified herein.

B. Submittals of shop drawings and product data shall be particularly detailed and complete. Submittals shall be complete with the manufacturer's guarantee. Piecemeal submittals will be returned without review.

C. Submittal information shall include schematic diagrams, point-to-point internal wiring diagrams, point-to-point field wiring diagrams, and other necessary diagrams and installation requirements for the motor starters, motor control center, automatic transfer switch, combustible gas monitor, float control system, alarm annunciator panel, intrusion alarm system, Control Panel including PLC, its Operator Interface Unit, annunciator panel, panel layouts and other components and systems that are interfaced to the other systems.

D. Specification Data and Drawings: Furnish instrument specification data sheet as per ISA standard instrument specification form, if applicable, wiring and/or connection diagram, outline dimensions, installation diagram and manufacturer's catalog for each instrument.

E. Panel Drawings: Furnish panel drawings for control panel.

F. System Diagrams

1. Schematic diagrams: Show point-to-point internal wiring diagrams, point to point field wiring diagrams, and other necessary diagrams and installation requirements for the control system and other components and systems that are interfaced to these systems.
2. Interconnecting Wiring Diagrams: Show schematically the wiring and piping runs for each instrumentation and control system. The diagram shall show and identify, with location noted, all instruments, piping and appurtenances furnished under this section and related electrical equipment furnished under other Sections. All terminal blocks and pipe taps shall be identified.

G. Software Documentation: Submit system software, application software, I/O point data base listing, programming ladder diagrams, graphic pages and report forms in prints. Software, application programs, ladder diagrams and control logics shall also be submitted in 740MB CD-R. The system integrator shall furnish the station operational program. The CD ROM copy and printout of the PLC control program shall be furnished to Engineer at the time of start-up. Disk and printed copy of the operating program shall be maintained on the file with the system integrator.

H. Instruction Manuals: Submit instruction manuals covering installation, operation, calibration, maintenance, diagnostic and repair for all hardware and software.

I. Record Documents: Accurately record actual calibration setting and scales of instruments.

1.5 Work For Hire

A. Any and all configuration, programming, setup or other software functions (SOFTWARE) performed on all intelligent devices provided as part of this Project is to be considered “Work for Hire” under the 1976 Copyright Act as amended (title 17 of the United States Code). The SOFTWARE shall be owned by IDOT and shall be turned over to IDOT fully documented as the work is completed.

B. IDOT intends only to obtain the SOFTWARE for its own use.

C. IDOT will not prevent the SOFTWARE supplier from reuse of the SOFTWARE concepts and ideas for other projects. Any reuse of the SOFTWARE concepts and ideas generated under this Project is solely the responsibility of the SOFTWARE supplier. The SOFTWARE supplier shall defend, indemnify and hold harmless IDOT from all claims, damages and expenses (including reasonable litigation costs), arising out of any use, misuse or misapplication of SOFTWARE concepts and ideas.

1.6 Operational and Performance Requirements

A. The control system includes a PLC system with an Operator Interface Panel (OIP) for human interface and with a level sensing system as the primary means of wet well level measurement and a multi-float/relay level monitoring system as the backup pump control system.

B. The PLC shall check the validity of analog level signals using float levels as reference, and select a valid signal for pump control (default to analog). If level signal is invalid, then the point level inputs signals from the multi-float system shall be used for pump control.

C. The Control System shall be designed for full automatic control of the pump station.

D. Pumping operation of the facility shall respond to water levels sensed in accordance with the pumping operation tables shown on the Drawings. The Programmable Logic Controller (PLC) shall be capable of automatically controlling pumping operations.

E. The control panel shall be designed to establish a 3-pump duty cycle for the main pumps and a 1-pump duty cycle for the low flow pump. The PLC shall sequence the pumps in its respective group in a cyclic mode, based on the sequence selector switch position. In the event of PLC failure, the float system shall control the pumps in accordance with control elevations shown on the drawings.

F. Conceptual PLC input/output (I/O) points are defined in the I/O Schedule on the drawings. In addition to those points shown, provide all I/O points necessary to affect a complete and operable system. Also, provide a minimum of 20% prewired spare I/O points of all types used. Wire spare points to terminal blocks. Segregate main pump inputs and outputs so that that a failure of one digital input (DI) or digital output (DO) cards shall not impact more than one main pump.

G. Control Scheme and HMI Development: After shop drawing review, the Contractor shall arrange and conduct minimum two software review meetings with systems integrator, IDOT personnel and Engineer for the development of control scheme and HMI screens. The first meeting shall be held to establish the requirements of the project. The system integrator shall develop the control scheme and HMI screens based on these requirements and present them at the second meeting for review by IDOT and the Engineer. If there are any deficiencies or they are determined not to be in compliance with the requirements specified at the first meetings, the system integrator shall correct those deficiencies and present them at a third meeting, if necessary, as determined by the Engineer. The control scheme and HMI screens shall not be implemented until approved by the Engineer. Provide minimum one week notice prior to setting up each of those meetings.

H. Systems Integrator Qualifications: The Contractor shall submit qualifications of the systems integrator for approval. The integrator must have prior experience in PLC based control systems for storm water pumping stations and shall have a minimum of 5 years of experience of developing and implementing such systems. The submittal shall include a minimum of 5 similar projects, previously implemented by the systems integrator and shall include references, contacts and telephone numbers for those projects.

1.7 Guarantee

A. All electrical equipment shall be guaranteed from all defects of material and workmanship for the manufacturer's standard length of guarantee or for 1 year from the date of final acceptance, whichever is longer.

1.8 Delivery, Storage and Handling

A. Delivery, storage and handling shall be in accordance with Manufacturer's recommendations and with IDOT Standard Specifications.

PART 2 - PRODUCTS:

2.1 Motor Control Centers

A. General

1. Provide Motor Control Center, service entrance rated main circuit breakers, automatic transfer switch, starters and circuit breakers to feed all equipment as shown in Drawings.
2. The equipment shall comply with all applicable requirements of ANSI for industrial control apparatus, IEEE Publication No. 15, and NEMA standards for industrial control, Publication No.ICS-1.
3. The Sections and Compartments shall be designed, manufactured and tested in accordance with the provisions of UL procedure 845. The UL label shall be displayed on each vertical section and on individual compartments wherever possible.
4. The Sections and Compartments shall be NEMA Class I-S, Type B. Enclosures shall be as otherwise specified herein.
5. The Mains and Sections shall be coordinated with the suppliers of pumps and other equipment and shall be sized to match the equipment loads for a fully operational system.
6. The Sections and Compartments shall be the finished product of Eaton or Square D who shall also be the manufacturer of the starters installed within.
7. The Sections and Compartments of MCC shall be complete, including all main and auxiliary bus work, door interlocks, internal wiring and other equipment required for the control and protection of associated circuits.
8. The Sections of MCC shall be completely tested at the factory, in accordance with ANSI and NEMA standards, including operating and high potential tests. A record of the tests shall be furnished to the Engineer prior to delivery of the equipment.
9. Acceptable Manufacturers: Eaton, Square D, General Electric, Allen Bradley or approved equal.

B. Enclosures

1. Enclosures shall be dust-tight and drip-proof, with gasketed doors, NEMA 1.
2. Each vertical section shall be nominally 20 inches wide by 21inches deep by 90 inches high, except for ATS section, which will be 28" wide.
3. The equipment shall be dead-front construction, unless otherwise specifically indicated.
4. Enclosures shall incorporate individual unit compartments as generally indicated on the drawings, separated from each other by means of metal pans, structure walls and baffles, designed and tested to dissipate and limit communication of fault currents. Unless otherwise specifically indicated, structures shall have individual compartments arranged in a manner to accommodate not more than six NEMA size 1 starters in a vertical section.

5. Each utilized compartment and each usable space unit shall have an individual flush door, a concealed hinge, and captive, spring-loaded quarter-turn fasteners. Each unusable space shall have a matching flush plate attached with machine screws or as otherwise approved by the Engineer. Doors on combination motor starter or overcurrent device units shall have mechanical interlocks, with hidden override, to prevent the doors from being opened unless the respective circuit protective device is in the off position.
6. Usable space units shall not be less in number and size than indicated on the drawings and each space unit shall be equipped with bus work and rails, sized for the maximum possible future load possible for that space, ready for the future installation of a combination starter or overcurrent device.
7. Sections structures shall have a top horizontal wireway, isolated from the horizontal bus, accessible via removable covers. Adequate top and bottom conduit and cable entry without structural interference shall be part of the motor control center design. Wiring shall be safely accessible without disrupting service.
8. Each vertical section shall have an individual vertical wireway with a hinged door or doors held closed with captive spring-loaded quarter-turn fasteners. Vertical wireways shall be isolated from the unit compartments.
9. Unit disconnects (unit overcurrent devices which are for feeders or which are part of combination starters) shall be operable via a separate mechanical operating mechanism which is not part of the device and which is operable with the unit door closed. The operator shall have a position indicating handle and it shall be possible to pad lock the handle in the "on" or "off" position. When the unit door is open, an interlock shall be provided to prevent closing the disconnect. An interlock shall prevent reinsertion of a draw-out unit while the disconnect is in the "on" position.
10. The manufacturer shall make particular note of NEC requirements. Where indicated on the drawings, motor control centers shall be installed on 4-inch high concrete pads. The arrangement of unit compartments and overcurrent device operators within compartments shall keep all operating handles, when in their highest position, no higher than 6.5 feet above the finished floor and this limitation shall take into account concrete pads as applicable.
11. Sections of motor control center shall have a steel channel base and shall be complete with end plates to cover base openings at the ends.
12. Sections of motor control center shall have shipping splits, coordinated as required to assure ease of building entry and ease of installation. The manufacturer shall assemble the complete line-up at the factory to assure matching of sections and shall appropriately mark and ship all parts and hardware required for re-assembly at the project site.
13. Motor control centers shall be chemically cleaned and treated to remove all dirt and grease and shall be prepared to assure a good paint finish. Enclosures shall be factory painted inside and outside. The type of paint finish shall be the manufacturer's standard. The colors of the motor control center enclosure shall be the manufacturer's standard internal color and the manufacturer's standard light gray external color.
14. Each motor control center section, including all auxiliary sections, shall be equipped with 120volt space heater to minimize condensation. The heaters shall be thermostatically controlled. The heaters shall be energized upon delivery to the site.

C. Busses

1. Unless otherwise indicated, main horizontal bus and vertical busses shall not be less than 600 amperes.
2. A copper ground bus having a cross-sectional area of not less than 0.375 square inches shall extend for the full length of each motor control center. It shall have adequate lugs for the connection of grounding conductors and it shall be bonded to each vertical section. The motor control center shall be grounded to the nearest main water pipe.
3. All bus work shall be mechanically secure. Buses, insulators and supports shall be rated to withstand a short circuit of not less than 65,000 RMS symmetrical amperes without damage. All bus joints shall be fronting accessible for ease of maintenance.
4. For line-ups to be mounted with backs against walls, all bus bolts, etc. shall be completely accessible from the front.
5. Buses (horizontal and vertical) shall be isolated from unit compartments and wireways and from each other, including phase-to-phase isolation. Locations for stabs for starter units and the like shall be equipped with removable plugs.
6. Neutral bus shall be provided in main and generator breaker sections.

D. Motor Starter Units

1. Unless otherwise indicated motor starters shall be full-voltage non-reversing starters.
2. Unless otherwise indicated motor starters shall be combination type, complete with motor circuit protector type short circuit overcurrent protective devices as specified herein.
3. Starters shall be sized for the motor to be connected, but shall not be smaller than NEMA size 1. Starter size shall be carefully coordinated based on the motor characteristics of the motor actually to be connected and the manufacturer's starter ratings. Where special pumps are involved, horsepower alone may not be sufficient to fully coordinate starter sizing. Horsepower ratings shown on the drawings are approximate.
4. All full-voltage non-reversing starter units through NEMA size 4 shall be of the draw-out type complete with guide rails and stab alignment means.
5. All starter units shall be equipped with pull-apart terminal blocks for control wiring and, for starter units through NEMA size 4, pull-apart terminal blocks shall be provided for power wiring.
6. Starters shall be electrically operated, electrically held, 3-pole, with arc-extinguishing characteristics and renewable silver-to-silver contacts. Each starter shall have an overload relay assembly with a thermal bimetallic overload element for each phase that shall be sized to the specific motor nameplate load data. Unless otherwise indicated, overload relay shall be resetable via an insulated button on the unit compartment door.
7. As a minimum, each starter shall be equipped with two normally open (N.O.) auxiliary contacts in addition to a starter seal-in (holding) contact. Additional contacts shall be provided as indicated or required for the control circuits indicated. An auxiliary relay shall be provided where the numbers of contacts required exceed the number, which can be mounted on the starter. Unused contacts shall be spare.

8. Unless otherwise indicated, control circuits shall operate at 120 volts derived from a control transformer integral to the combination starter. The control transformer shall have a fused secondary and shall be sized adequately for the starter and all connected control devices but in no case shall the transformer be sized less than 50 volt-amperes over the capacity required to operate the starter. Control transformers shall be NEMA type AA, dry, with a temperature rise not exceeding 55 degrees C. above a 40 degrees C. ambient temperature at continuous rated load. Data submitted for approval shall include starter coil load data and total VA rating of control transformers.
9. Starters shall be complete with control devices as required for the control of circuits, as indicated control devices shall be as specified herein. Control devices where indicated, shall be mounted on the unit compartment door and all control devices shall be arranged such that they do not interfere with access to starter wiring. Control device contact blocks shall not separate from the device operator when the compartment door is opened.

E. Circuit Protective Devices

1. Unless otherwise indicated, protective devices for incoming supply and downstream feeder circuits shall be circuit breakers as specified herein.
2. Circuit Breakers
   a. Circuit breakers shall be UL listed, molded case, thermal-magnetic, manually operated circuit breakers of the trip ratings shown or indicated.
   b. Unless otherwise indicated, circuit breakers shall be 3-pole.
   c. Unless otherwise indicated, circuit breakers shall be rated for use on 480 volt circuits.
   d. Multi-pole circuit breakers shall have a common trip and single operating handles. Handles shall be trip free. Circuit breakers in 250 ampere frames and above shall have an adjustable magnetic trip setting.
   e. The circuit breakers shall indicate "ON", "OFF", and "TRIPPED" conditions.
   f. Unless otherwise indicated, circuit breakers shall have a UL listed interrupting rating of not less than 65,000 RMS symmetrical amperes at 480 volts.
   g. Where indicated or where required for indicated functions, circuit breakers shall be equipped with accessories such as shunt trips, alarm switches, auxiliary switches, and under voltage release.
   h. As a minimum, each circuit breaker shall be equipped with one normally open (N.O.) and one normally (NC) closed auxiliary contacts.
3. Unless otherwise indicated, protective devices for use in combination starter units shall be motor circuit protectors as specified herein.
4. Motor Circuit Protectors
   a. Motor Circuit protectors shall be manually operated and shall have a magnetic trip level adjustment. Trip ratings shown on the Drawings are approximate and the trip rating provided shall be as recommended by the device manufacturer for the characteristics of each respective motor. The Contractor shall coordinate device selection with motors provided under other Divisions.
   b. Motor circuit protectors shall be 3-pole, for use on 480 volt circuits, with common trip and with position-indicating handles.

c. Motor circuit protectors shall be rated for use within a motor control center having an available fault current of 65,000 RMS symmetrical amperes. In order to meet this requirement, the devices may be equipped with bolt-on fuse type current limiting devices if required.
d. Unless otherwise indicated, each motor circuit protector shall be complete with both an alarm switch to close a contact whenever the breaker is tripped and an auxiliary switch to close a contact whenever the breaker is open. (The auxiliary switch may also close upon trip, but even when so operating, the separate alarm for trip shall also be provided.) Contacts shall be rated not less than 7 amperes.

F. Control Devices

1. Unless otherwise specifically indicated, pushbuttons, selector switches, indicating lights and other control devices shall be heavy-duty oil tight types.
   a. Contact blocks for pushbuttons and selector switches shall have not less than one double pole double throw (DPDT) contact. Pushbuttons shall be color-coded and shall be black for "start" and red for "stop" and as indicated or selected by the Engineer for other functions.
   b. Indicating lights shall have built-in transformers, 6-volt miniature bayonet base incandescent lamps and lenses of the colors indicated. Unless otherwise indicated, indicating lights shall be push-to-test type.
   c. Legend plates shall be provided on all oil tight control devices. Unless otherwise indicated, green indicating lights shall have "RUNNING" legend plates and legend plates for other indicating lights shall be as indicated or as selected by the Engineer.
   d. Where indicated, or where control functions are not possible with oil-tight units, instrument-grade multi-position control switches having pistol-grip handles.
   e. Control relays shall be hermetically sealed, with 4 pole Form C, high reliability contacts rated not less than 5 amperes resistive. Provide relaying clips to hold relay in place.
   f. Synchronous Motor Time Delay Relays: Synchronous motor driven time delay relays shall have a nominal 4-inch square face, shall be "on-delay" or "off-delay" as indicated and shall be of the range indicated. They shall be suitable for flush panel mounting. Each relay shall plug into a permanently wired molded case assembly. Time shall be set by turning a knob with a pointer on the face of the relay. The relay shall have a cycle progress pointer which will advance clockwise from the setting back to zero during timing. The relays shall have instantaneous and delayed contacts as required for the functions indicated. Unless otherwise indicated the relays shall be for 120-volt operation.

g. Solid State Time Delay Relays: Solid state time delay relays shall be "on-delay" or "off-delay" as indicated or may be of the convertible operation type. The relays shall have the dial range indicated and shall be complete with a permanently wired plug-in base. Where indicated, they shall be suitable for flush panel mounting, and shall then be complete with cycle progress pointer. When not indicated as for flush panel mounting, the relays shall be suitable for internal mounting and they shall then be equipped with retaining clips to keep them secure in their plug-in sockets. They shall have contacts as required for the functions indicated. Unless otherwise indicated, the relays shall be for 120-volt operation.
h. Overload relay shall be resettable without opening the door.

G. Automatic Transfer Switch

1. Automatic transfer switches shall be air break, double throw interrupter type, electrically operated and mechanically held in both the normal and emergency positions. The switch operators shall be single solenoid or single motor operated and shall be momentarily energized by the sources to which the load is transferred. Switches shall be capable of transfer in either direction on 70% of rated voltage.

2. Transfer time in either direction shall not exceed 0.5 second.

3. The switch shall be rated for 480 volts. The current rating shall be as indicated, as a minimum. Main contacts and main current carrying parts shall be insulated for 600 volts. The rating of the switch shall be a 24-hour continuous rating in a non-ventilated enclosure for all classes of loads including resistance inductive, tungsten lamp and ballast loads. Temperature rise shall conform to NEMA standards.

4. Main contacts shall be mechanically held in position by the operating linkage without the use of hooks, latches, magnets or springs and the contacts shall be of a silver-tungsten alloy.

5. Separate arcing contacts, with magnetic blowouts shall be provided. Interlocked molded case circuit breakers or interlocked contactors will not be acceptable.

6. The number of poles shall be as indicated. Four pole switches shall be equipped with four fully-rated poles, all operating on a common shaft and the short circuit rating of the fourth pole shall be identical to the rating of the main poles.

7. Not less than two auxiliary contacts, one closed on normal and one closed on emergency, rated not less than 10 amperes at 120 volts, shall be mounted on and actuated by the same shaft as the main contacts. Additional relay contacts, timers, control relays and associated wiring required for the functions indicated shall be front accessible. All wiring shall be tagged with self-sticking or tubular wire markers.

8. Except for the normal functioning of a programmed neutral position, failure of any component shall not result in a neutral position where both normal and emergency contacts remain open. Also, the failure of any component shall not result in a condition where both normal and emergency contacts are closed, or attempt to close at the same time.

9. Unless otherwise indicated, transfer switches shall be without integral and overcurrent or short circuit protection.

10. Switch components shall be easily maintainable from the front without removal of the switch from its enclosure and without disconnecting the main power cable. Adequate safety baffles and barriers shall be provided and all components shall be clearly identified.

11. Manual Operator
    a. Each transfer switch shall be equipped with a manual operator. The manual operator shall operate the switch in the same transfer time as normal electric operator transfer. Interlocking shall be provided to prevent electric operation of the switch when the manual operator is used. The manual operator shall be arranged to provide adequate shielding and protection from live electrical parts for operating personnel.

12. Withstand Rating, Tests and Certifications
    a. Transfer switches for 480 volt circuits shall have a withstand rating of not less than 50,000 RMS symmetrical amperes at 20% power factor for a duration of 3 cycles at 480 volts without contact separation or damage.

    b. In addition, they shall have a UL Standard 1008 listed withstand and closing rating, at 480 volts, when coordinated with molded case circuit breakers, of not less than 85,000 RMS symmetrical amperes.

    c. Product data submitted for approval shall include copies of a report form an independent testing laboratory which documents that identical switches have met the requirements of UL Standard 1008 for the specified ratings. In addition, the data shall include certified copies of test documentation of the 3-cycle withstand requirements specified herein.

    d. Also, the manufacturer shall document and certify that the switch has sufficient arc interrupting capabilities for 50 cycles of operation when operating between a normal and emergency source for the following load:

       600% of rated current at 0.4 power factor.
       20% of rated current at 0.4 power factor.

13. Basic Operation
    a. Operation shall be controlled by voltage sensing relays in each phase of both the normal and emergency sources.

    b. Upon a decrease in voltage on one or more phases of the normal source to roughly 70% of rated voltage, the load shall be transferred to the emergency source, after an emergency transfer, time delay as specified. Upon restoration of voltage to all phases of the normal source to roughly 90% of rated voltage, the load shall be re-transferred to the normal source, after a normal retransfer time delay as specified. If the emergency source fails at any time while connected to the load, the switch shall immediately retransfer to the normal source upon restoration of voltage to the normal source on all phases.

14. Control Features: Each transfer switch shall include, as a minimum, the following features of control:
    a. Emergency Transfer Time Delay - This time delay relay shall delay the transfer to the emergency source for a time to allow for momentary outages. This time delay shall be adjustable with a range of roughly 0 to 5 minutes.

    b. A test switch shall be mounted on the enclosure door to simulate failure of the normal power source.

    c. Indicating Lights - The switch shall have indicating lights mounted on the enclosure to indicate which position, normal or emergency, the switch is on.

    d. Normal Source Selector - The transfer switch shall be mounted on the enclosure door to allow either source to be selected as the normal source.

    e. Programmed Neutral Position - The switch operation shall have a programmed, adjustable time neutral position in which neither the normal or emergency sources are connected to the load. The time period shall be adjustable from roughly 0 to 20 seconds to prevent mechanical damage to motors which are running at the time of transfer.

    f. Override Switch - The transfer switch shall have an override switch, mounted on the enclosure door to hold transferred switch in the emergency position regardless of the status of the normal source.

    g. Auxiliary Contacts - An auxiliary contact for each of the following functions:

        1) A contact closed when source 1 connected (Normal Position).
        2) A contact closed when source 2 connected (Emergency Position).
        3) A contact closed when transferred to emergency.
        4) A contact closed on utility source 1 undervoltage.
        5) A contact closed on utility source 2 undervoltage.

    h. Normal Retransfer Time Delay - This time delay relay shall delay the retransfer to normal and it shall be adjustable from 0 to 30 minutes.

15. Enclosure
    a. Where indicated, transfer switches shall be installed within motor control centers. Such switches shall be installed at the motor control center manufacturer's factory and shall be an integral part of the motor control center equipment. The depth of the enclosure shall be the same as that of the motor control center and shall not exceed 21 inches.

    b. Where transfer switches in separate enclosures are indicated, those enclosures shall be NEMA 12 unless otherwise indicated.

16. Instructional Data/Material
    a. Not less than 4 full sets of hardbound installation and maintenance manuals, complete with any appropriate descriptive literature and any special tools required to service transfer switches shall be provided. Where more than one size is provided, the material shall address each size and shall be clearly delineated. The material so furnished shall include complete wiring diagrams.

b. Plastic-laminated step-by-step operating and test procedures, complete with schematic wiring diagrams shall be permanently attached to automatic transfer switch enclosures..

H. Micro Processor Based Metering System

1. The motor control center main line metering system shall be digital multi-meter, measuring current, voltage, power, energy, reactive power and power factor. The meter shall be Eaton type IQ 250 with necessary transducers or equal. Provide Modbus interface to communicate with PLC,

2.2 Surge Protective Devices

A. Provide surge protective devices (SPDs) at locations shown on the drawings.

B. SPDs shall be designed, manufactured, tested and installed in accordance with the following codes and standards:

1. NEC 2014

2. UL1449

3. UL 1283

4. ANSI/IEEE C62.34, C62.41, C62.45

C. Performance Ratings

1. Surge current capacity of ANSI/UL Type 1 SPDs shall be 250 kA surge rating per mode with field replaceable surge modules.

2. The nominal discharge current rating shall be Type 1, 20 kA.

3. The SPD shall provide protection in all modes, L_L, L-N and L-G

4. The maximum UL 1449 listed surge ratings for the modules shall not exceed the following: L-L: 2000V; L-G: 1200V; L-N: 1200V.

D. The SPD shall be life cycle tested to withstand 10kA (8x20µs), 20kV (1.2x50µs), IEEE C62.41 Category C3 surge current with less than 5% degradation of clamping voltage. The SPDs shall withstand a minimum of 15,000 Category C3 surges per mode.

E. All surge suppression components shall be individually fused and rated to allow maximum specified surge current capacity and with an interrupting rating greater of 200Kaic. The overcurrent protection must be part of all testing (ANSI/UL and surge testing). Devices that utilize a single fuse to protect two or more suppression paths are not excepted. Replaceable fusing is unacceptable. The SPD shall be tested and shipped as a complete unit as tested by ANSI/UL.

F. Submittals: Submit installation manual, electrical and mechanical drawings that show unit dimensions, weights, component and connection locations, mounting provisions, connection details and wiring diagram. These specifications are based on the Emerson Network Power Surge Protection 570 Series devices and LEA Model LS200 series surge protective devices. All other manufacturers shall submit for 15-day pre-approval, a completed detailed compliance or exception statements to all provisions of this specification to allow consideration. Manufacturers shall submit test data verifying surge current capacity, test data validating life cycle capabilities and provide UL1449 3rd Edition documentation for UL Type 1 20kA approval.

G. Quality Assurance: The manufacturer shall be ISO 9001:2000 certified. The manufacturer shall have a minimum of fifteen (15) years experience in the design, testing, and manufacturing of UL/ANSI approved surge protective devices

H. Component Testing and Monitoring: The SPD shall be single pulsed surge current tested in all modes at the rated surge currents witnessed by an independent certified test organization. The test shall include a surge impulse (6kV [1.2x50µs], 500 amp [8x20 □s] waveform) to benchmark the unit's suppression voltage. The applied impulse is followed by a single pulse surge of the maximum rated surge current magnitude, followed by a second 6kV [1.2x50µs], 500 amp [8x20 □s] impulse as a means of measuring clamping deviation. Less than 10% change in clamping characteristics is required to pass. Provide test report as part of the pre-approval process.

I. Environmental Requirements:

Storage Temperature:		-55 to +85°C (-67 to +185°F)
Operating Temperature:	-	40 to +60°C (-40 to +140°F)

J. Warranty: The manufacturer shall provide a standard ten year full parts replacement warranty. The warranty shall not be prorated during the warranty period. Any unit requiring removal and shipment to a certified technician for repair will not be accepted.

K. The SPD shall be provided in a NEMA 12 enclosure. The SPDs shall have an integral non-fused disconnect switch with through the door handle. Its terminals shall accommodate the wire sizes shown on drawings. The SPDs shall have Red and Green indicators and Form C contacts, audible alarm and surge event indication.

L. The SPD shall be installed with as short of conductors as practically possible and twist the SPD input conductors together to reduce conductor inductance. The Contractor shall follow the SPD manufacturer's installation instructions and comply with all applicable codes.

2.3 Control Panel

A. Control Panel

1. Provide control panel for control of the pumps and for monitoring and displaying of the alarms. It shall include PLC, Operator Interface Panel, UPS, intrinsically safe float control relays, level sensing system, pump sequence selector switch and alarm panel, as described herein.
2. Selector Switch shall be Electroswitch series 31 three position switch with three decks, maintained, oval shank handle or approved equal. The contact arrangement and wiring shall be done as shown on the Contract Drawing.

B. PLC System

1. Provide Allan-Bradley CompactLogix programmable logic controller (PLC) system with local input/output (I/O), Modbus interface to power meter, interface panels, modem and other capabilities as specified herein and shown on the Drawings.
2. Provide Operator Interface Panel (OIP), as described in the Section, control/graphic software, GE Proficy Machine Edition View and Control software or approved equal, PLC programming software, Rockwell Studio 5000 Automation Engineering and Design software to program and configure the PLC system. and other application software as specified herein and for a fully operational system.
3. Perform real time control, including, sequencing, of the pumps and monitor water levels in the wet well and trash rack chamber. Detect and alarm upon a clogged screen condition.
4. The system shall allow the operator to manually control when viewing the appropriate graphic screen on OIP
5. All process control functions including PID, calculations, sequencing, set points, timing, etc., shall be done in the PLCs. The graphic screens, program development, set point modification, shall be done through the OI or a personal laptop.
6. Wiring shall be brought to terminal strips near the bottom of enclosures and 10 percent spare terminals shall be provided in each. The identification of terminals shall conform to the schematic diagrams and shall consist of adhesive labels as manufactured by Brady, Thomas, or equal.

C. Operator Interface Panel

1. Interface panel shall be 12”, GE QuickPanel+ or approved equal.
2. Interface panel shall be configured to allow operator access to status and control of local processes being monitored by the PLC. Provide all software, hardware, cables, and appurtenances for a fully configured system.
3. Collect and store accurate, reliable operating information for present and future uses.
4. Accumulate and store equipment running times for use in preventative maintenance.
5. Provide color graphic displays and summary reports for use by the plant operating and supervisory personnel.
6. Provide trending for wet well level.
7. Provide control system diagnostics.
8. Provide industrial grade NEMA 4 sealed panel with keypad. Keypad shall include a minimum of 15 user definable panel buttons and 5 user definable control buttons. Provide 12.1-inch, 800 x 600 pixel or 6.5 inch as specified, 640 x 480 pixel, VGA, color TFT display.
9. Provide PLC communications interface drivers to allow direct access of the interface panel to the PLC and network. During configuration, the System Integrator shall assign specific addressing and input/output access to allow monitoring of the specific local process. Provide a minimum of two configurable serial communication ports.

10. Provide Windows based configuration software with the interface panel, as specified above. Configuration software shall utilize fill-in-the-blank style structure and support a minimum of 30 control display pages per panel. Control pages shall be stored in non-volatile EEPROM memory.
11. Provide screen templates for screen configuration including discrete indicator, analog numeric readout, message text display, graphical analog bar, register table, alarm windows, and control button. Panel software shall allow mixing of custom graphics and templates on any page configuration. Provide variable sizing of templates with no limitation on the number of elements on any alarm page.
12. Provide custom graphic capability for a schematic, graphical representation of the process. Resolution of graphics shall be to the screen pixel level. Custom graphics shall have the ability to be animated including proportional and status color based strategies. Provide a library of pre-developed symbols based on ISA graphical standards.
13. Provide alarm monitoring capabilities with audio output. Alarm buffer shall store a minimum of 100 alarms for scrolling, review, and acknowledgment by the operator using an alarm summary page. Provide alarm acknowledge and audio output silence logic. Alarm audio output shall be adjustable up to 2 watts maximum.
14. Provide system status screens that summarize the real time operational status of the pump station. Main menu and navigation screens shall be presented in a general to specific hierarchy.
15. Provide Help screen(s) that summarize operator interface formats, use of function keys, navigational standards, etc.
16. Provide capacity for a minimum of 100 text messages.
17. Provide all configuration, transfer, and graphics software as required.
18. Unit shall operate from 24V DC power source. Operating temperature range shall be 0-50 o C with 20-80% humidity range, non-condensing. Provide a single Form C alarm fault contact rated a minimum of 1A at 120 VAC. Contact shall be wired into a discrete input of the PLC serving the OIP.

D. Float Control System

1. Provide float control system designed for operation with three main and one low flow pumps.
2. Float switches shall be installed as shown on drawings and they shall be direct acting 120 VAC, 20A SPST Normally Open non-mercury switch encapsulated in a #316 stainless steel, Teflon coated housing with required length of 3-conductor #14, 105 strand, water resistant, Type SO cable, pipe mounted, completed with mounting clamps.They shall be suitable for use with intrinsically safe float relays.
3. Intrinsically safe relay shall be provided for each float. The relay shall be solid state electronic modules operated on 120V, 60Hz power supply, 13 volts sensing circuit suitable for application of float switches exposed in Class I, Division 2, Group C & D hazardous atmospheres, FM and U.L. approved. The relay shall have isolated 2 N.O. contacts or isolated 1 N.O. and 1 N.C. contacts rated 8 Amp at 250VAC. The relay shall be Square D or Warrick Controls Series 17, or approved equal. The float relay wiring shall be installed with a barrier from rest of the wiring.
   The system shall be intrinsically safe for installation of floats in the wet well. The float switch wiring shall be installed with a barrier from the rest of the wiring.

4. The system shall be complete to control pumps and provide alarm functions indicated on the Contract Drawings.
5. The float switch cables shall be terminated in a NEMA 4 junction box in the pump room and shall be extended to the Control Panel.

E. Submersible Level Sensing System

1. The level sensing system shall consist of submersible pressure sensor/transmitter units that are intrinsically safe and suitable for direct submersion into the liquid being measured. Sensor size shall not exceed 1-1/4 inch diameter by 9-inch length. The sensor shall be a solid-state variable capacitance or diffused silicon semiconductor type that shall provide an output signal directly proportional to the sensed pressure over a factory-calibrated range. The sensor assembly shall have a stainless steel or titanium housing and shall be supported by a polyethylene or urethane jacketed cable with a minimum 200 lb. test strength. The sensor cable shall be of sufficient length so that no splice or connector is required in the wet or inaccessible area, and the vent tube termination point is located in an area protected from dirt and moisture.
2. The transmitter shall have a two-wire type 4-20 mA dc current output that is proportional to level. The output shall have surge protection, and shall not be damaged by reverse polarity. The transmitter shall be suitable for an operating temperature range of 0 deg C to +50 deg C. Accuracy of the level transmitter shall be ±0.25 percent "best straight line", with an overall combined accuracy of ±1 percent over the entire operating temperature/pressure range.
3. Provide one unit in the wet well and one unit in the trash rack chamber.
4. Submersible pressure sensing level transmitters shall be Ametek U.S Gauge-PMT Products "Model 575", Endress+Hauser “Waterpilot” or “Deltapilot Series”, GE Measurement & Control Solutions "Model PTX1830", or Siemens “SITRANS P MPS”.

F. Alarm Annunciator

1. Unless otherwise indicated, alarm annunciator shall be of the solid state type and shall be configured of dual-alarm modules in an arrangement as indicated on the Drawings or as otherwise directed by the Engineer.
2. Each module shall be engraved as indicated on the Drawings or as otherwise directed by the Engineer.
3. The annunciator shall operate in a "Sequence A" flashing mode as follows:
   The control logic selectable to incorporate lock-in or non-lock-in alarm activation. Lock-in selection shall maintain alarm status until the alarm has been acknowledged by depressing the “acknowledge” pushbutton at the annunciator. Non-lock-in selection shall permit alarm status to return to the normal off condition as soon as the alarm input is cleared.
   Condition Window Status
   Normal Off
   Alarm Flashing
   Acknowledge Steady On
   Normal (clear) Off
   Lamp Test Steady On
4. Each alarm window shall be illuminated with not less than two long-life LED lamps which shall be easily accessible for replacement.

5. Each annunciator shall be complete with an integral flasher unit. Alarm logic, such as for the flasher, shall be solid state. The flasher shall not occupy a designated alarm module, i.e., if twelve alarm positions are shown, all shall be useable for alarms.
6. Unless otherwise indicated, annunciators shall have provisions for an audible alarm and silence upon alarm "acknowledge" condition for possible future addition of an audible alarm.
7. Unless otherwise indicated, annunciators shall operate from a 120 volt, 60 Hz supply.
8. Unless otherwise indicated, annunciators shall be flush panel mounted.
9. Blank alarm module units shall be fully equipped for alarms.
10. After power failure all alarm output contacts shall remain in the original positions just before the power failure.
11. Alarm annunciators shall be Panalarm Series AN-3100D or approved equal.

G. Uninterruptible Power Supply (UPS) System

1. Uninterruptible Power Supplies (UPS) System shall be provided for the PLC system as shown on the Drawings and specified herein. The UPS shall sustain operation during power failures, and shall provide power for an orderly shutdown to prevent the loss of data during power failure and shall provide isolation between the control system and the plant power system.
2. The UPS shall be a single phase, true on-line, with microprocessor controlled static inverter, hot pluggable batteries, battery charger, LED display and keypad, and manual isolated make before break maintenance bypass switch.
3. Under normal operating conditions, the critical load shall be continuously supplied by the UPS inverter. The battery charger shall maintain a float-charge on the battery. When AC line power fails, or goes out of tolerance, the inverter shall obtain power from the batteries and supply AC power to the loads without interruption.
4. The UPS system shall be sized to sustain the connected full load for a minimum period of 120 minutes in an operating environment of 32^{o} F to 104^{o} F. Final UPS sizing is the responsibility of System Integrator.
5. The UPS system shall be lightning and surge tested per ANSI/IEEE C62.41 and shall be capable of reducing an input spike to less than 3 volts on the output for a 2000 to 1 spike attenuation. The UPS system shall have 120 dB common mode and 60 dB Transverse mode noise attenuation. The UPS system shall provide a true separately derived power source as defined in the NEC article 250.30 with output neutral bonded to ground. There shall be no direct connection between input and output and less than 2 pf of effective input to output capacitance.
6. The UPS system output shall be regulated to 120 VAC + 3%, single phase three wire, 60 HZ + 0.5 HZ over the full dynamic range from no load to full load and low line VAC to high line VAC and low battery voltage to high battery voltage.
7. The UPS system shall provide computer grade sine wave power with 5 percent or less total harmonic distortion.
8. The UPS system capacity shall be rated in volt amperes (VA) while loaded with typical computer grade switch mode power supplies having a power factor of 0.6 to 0.7 and crest factor of 2.7 to 3.5.
9. The UPS system shall have an efficiency of at least 92% when operated from AC line.
10. The UPS system shall have built-in self-diagnostic monitoring capable of monitoring as a minimum AC volts in/out, AC current in/out, battery voltage, VA

load, watts, power factor percent of full load, time of day, system hours, inverter hours and projected run time available. Unit shall have relay contacts that close on UPS alarm condition and normal (utility) power failure.

11. The UPS system shall have a dual track redundant configuration that utilizes either line or inverter output for power and shall be designed to meet or exceed a MTBF of 100,000 hours.
12. The system input voltage shall be 120 VAC, 60 Hz, single phase, 3 wire. Provide external break before make disconnect switch to allow transition to like power for testing or removal of the UPS.
13. The system batteries shall be supplied with a battery cabinet of the same design and finish as the UPS. The batteries shall be sealed, no maintenance type rated to provide minimum continuous operation of connected equipment as specified herein.
14. The System Integrator shall provide sizing data on the UPS listing all loads and calculations required for sizing the UPS system. As a minimum a 1 KVA unit shall be provided. The battery shall be sized to carry the load for 120 minutes. The UPS system shall be Liebert GXT3 1000MT or approved equal.

2.4 Combustible Gas Monitoring System

A. The combustible gas monitoring system shall be a completely self-contained unit designed for continuous detection and monitoring of combustible gases, toxic gases or oxygen as shown on the drawings, using remote gas sensor/transmitters designed to measure the gas concentration.
B. The combustible gas system shall include one sensor with integral transmitters at floor level as shown on the drawings.
C. The combustible gas monitoring system shall operate in the diffusion mode, but also can be used with Ultima Sampling Module in applications where it is necessary or more convenient to draw a sample from a remote location. The combustible gas monitoring system shall be Model 9020 as manufactured by Mine Safety Appliances Instruments Company (MSA), or approved equal.
D. The gas monitoring system shall measure and display gas concentration. The system shall provide identifiable visual alarms when preset limits are exceeded. Relay outputs for alarms and analog signals representing gas concentrations shall be provided for transmitting an alarm to SCADA.

E. The system shall consist of at least two completely independent channels. An independent monitoring channel shall be provided with each sensor/transmitter having a full-scale range as specified. Each channel shall employ a three-digit LED display and three discrete alarm levels: caution, warning and alarm. Different color LED indicators shall differentiate alarm level: yellow for caution, amber for warning and red for alarm. A separate alarm relay output shall be provided for each alarm level. The alarm level shall be displayed by push-button. A second button, that also permits scrolling, permits easy change of the alarm levels. The sensor units shall be capable of being located remote from the monitor/readout unit by up to 5000 feet. Sensor unit shall receive power from and send signals corresponding to gas values to the monitor/readout unit. The IR type sensor units shall be in enclosures suitable for locations in Class I, Division 2, Group B, C&D classified areas. The sensor units shall have provisions for mounting to a wall or similar structure. The sensor for the pump room shall be an Ultima XE or approved equal, and the sensors in the stairwell, trash rack room, and wet well shall be Ultima XIR or approved equal.

F. The combustible gas Monitor shall be in NEMA 4X stainless steel enclosure, wall mountable assembly. All wiring connections shall be marked with functional designations such that connections can be made without the use of diagrams or tables. All connections must be easily accessible from the front.

G. Alarms and relays at the monitoring/readout unit shall be set for the following levels of gas concentration:
   1. Gas "WARNING" alarm - 20% LEL
   2. Gas "ALARM" - 50% LEL
   3. Trouble

H. In response to a WARNING or ALARM signal from the gas detection system, due to a high concentration of gas in the monitored space, alarm relay energized and the ventilation system for the monitored space shall be activated.

I. A calibration test kit for field checking the calibration of the gas detection system shall be furnished. The kit shall be complete, including a lightweight carrying case, dispensing valve, regulator assembly and hose, test coils and necessary cylinder for type of calibrating gas. The test kit shall be stored in an approved cabinet adjacent to and match the air monitor panel.

J. Spare parts shall be provide as follows:

   One set of fuses
   One set of lamps
   One sensor head assembly
   One sensor

K. The services of a qualified representative of the manufacturer shall be provided to inspect the installation, make any adjustments, test the equipment, field calibrate the air monitoring equipment upon completion of the installation; after 24 hours of operation and again after one week; and instruct the operating personnel in the operation, calibration and maintenance of the equipment.

2.5 Staff Gauges

A Two staff gauges, calibrated in feet and tenths of a foot, shall be provided, one each in the wet well and trash rack chamber for use to verify the float switch settings and level transmitter. Each gauge shall be porcelain enameled iron rod. The rods shall be professional type, 2-1/2" wide minimum, with large bold markings of a height for the full height of the wet well and the trash rack chamber. The trash rack chamber gauge's initial reading shall be offset by the difference in levels between the wet well and the chamber. Each staff gauge shall be attached and supported to the wall with corrosion-resistant hardware at locations to avoid conflict with level controls, and other equipment.

PART 3 - EXECUTION:

3.1 Examination

A. Verify layout of Motor Control Center, Control Panel, and location of Combustible Gas Detection System, Intrusion Alarm Panel and Fire Alarm System.

B. Verify that electrical power is available and have the correct characteristics.

3.2 Installation

A. Install system and components in accordance with manufacturer's specifications.

B. The installer shall provide all labor and perform all work to install and make operable all mechanical and electrical equipment necessary to assure safe and reliable operation.

3.3 Field Quality Control

A. Representative of the Manufacturer and System Integrator

1. The services of a qualified and approved manufacturer's representatives shall be provided to instruct on proper installation of the equipment, inspect the completed installation, make any necessary adjustments, participate in the startup of the equipment, participate in the field testing of the equipment, place the equipment in trouble-free operation, and instruct operating personnel in its operation and maintenance. This service shall include all equipment provided for this project including motor control center, pumping equipment, control panel, combustible gas detection system, fire alarm system, intrusion alarm panel and standby generator.
2. All equipment manufacturers shall provide written certification that their equipment has been installed in accordance with their requirements.
3. The start-up services, testing and training of the following equipment shall be coordinated with IDOT and Engineer shall be notified at least one week in advance:
   a) Motor Control Center and Automatic Transfer Switch
   b) Surge Protective Devices
   c) Pumping Equipment
   d) Control Panel
   e) Float Switch adjustment and operation
   f) Level Sensors calibration, adjustment and operation
   g) Combustible Gas Detection System
   h) Fire Alarm Panel
   i) Intrusion Alarm Panel
   j) Standby generator

4. The Contractor shall make arrangements for water, to fill the wet well, with the village as specified in Section 150030. At minimum, four fill-ups will be needed to complete the testing as described herein. The testing shall include the following in addition to the pump testing described in Section 150030:
   a) Generator and ATS testing: Coordinate with the utility and schedule an utility power outage to ensure generator automatically starts, transfer switch moves to emergency position and generator takes on load; then transfer switch moves to normal once the utility source has stabilized. This test shall be conducted with water in the wet well and shall include generator's ability to start and operate one low flow pump and one main pump as specified in Section 160030.
   b) Verify the level sensor calibration while the wet well is filled and emptied.
   c) Verify the float switch adjustment while the wet well is filled and emptied.
   d) Test the pumping system under normal power and control conditions.
   e) Test the pumping system under generator power and normal control conditions.
   f) Test the pumping system under a failed level sensor condition.
   g) Test the pumping system under a failed PLC condition
5. Training shall be provided for the equipment listed above to IDOT and Village staff. The training shall be provided over minimum 8 hours, spread over two to three days, until training on all systems are completed to the satisfaction of the Engineer. The training shall be conducted with water in the wet well so that all equipment, including float switches, level sensing system, pumps and standby generator are tested under live conditions with pumps in operation. The training may be scheduled in conjunction with the start-up of the pumps, upon approval by the Engineer, provided all preliminary testing has been completed successfully. The Contractor shall submit the training materials for Engineer's approval and shall notify the Engineer at least one week in advance of the scheduled training date.

END OF THIS SECTION 160020

SECTION 160030 – PACKAGED ENGINE GENERATOR SYSTEM

PART 1 - GENERAL:

1.1 Description

A. Major electrical equipment shall be the items of equipment specified herein.

B. The manufacturer of each specified item shall provide not less than four (4) hard-cover operation and maintenance manuals for the respective equipment item furnished. The manuals shall contain final, approved shop drawings and product data sheets (including any field additions or modifications), as well as recommended installation, testing, operation and maintenance procedures.

C. The manufacturer shall provide one set of any special tools, as applicable, required for the maintenance of the equipment, housed in a metal tool box.

D. Equipment furnished under this section shall be complete with anchor bolts and associated hardware required to anchor equipment to concrete. Anchor bolts and all hardware shall be galvanized steel.

E. For each specified item, a representative of the manufacturer shall check the installation and submit, to the Engineer, three (3) certified, signed statements, addressed to the Engineer, that the equipment has been properly installed and is in good working order.

F. Section Includes:

1. Engine generator set.
2. Cooling system.
3. Fuel system.
4. Starting system.
5. Weatherproof housing.

1.2 Related Sections

A. IDOT Standard Specifications - for Cast-In-Place Concrete.

B. Section 160000 - General Electrical Provisions.

C. Section 160010 - Basic Electrical Materials and Methods.

D. Section 160020 – Major Electrical Equipment.

1.3 References

A. Codes and Standards referred to in this Section are:

1. The generator set installation and on-site testing shall conform to the requirements of the following codes and standards, as applicable. The generator set shall include necessary features to meet the requirements of these standards:
   a. IEEE446 – Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.
   b. NFPA37 – Standard for Installation and Use of Stationary Combustion Engines and Gas Turbines.
   c. NFPA54 – National Fuel Gas Code.
   d. NFPA70 – National Electrical Code.
   e. NFPA110 – Emergency and Standby Power Systems.
2. The generator set and supplied accessories shall meet the requirements of the following standards:
   a. NEMA MG1-1998 part 32.
   b. UL1236 – Battery Chargers.
   c. UL2200 - Stationary Engine Generator assemblies.
3. The control system for the generator set shall comply with the following requirements:
   a. CSA C22.2, No. 14 – M91 Industrial Control Equipment.
   b. EN50082-2, Electromagnetic Compatibility – Generic Immunity Requirements, Part 2: Industrial.
   c. EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.
   d. FCC Part 15, Subpart B.
   e. IEC8528 part 4. Control Systems for Generator Sets.
   f. IEC Std 801.2, 801.3, and 801.5 for susceptibility, conducted, and radiated electromagnetic emissions.
   g. UL508. Safety Standard for Industrial control Equipment.
   h. UL1236 –Battery Chargers.
4. The generator set manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation, and service, in accordance with ISO 9001.

1.4 Submittals

A. Provide shop drawings and product data.

1. Show connections, mounting, and support provisions and access and working space requirements.
2. Wiring Diagrams for Systems: Show power and control connections and distinguish between factory-installed and field-installed wiring.

B. Product Data:

1. Include data of features, components, ratings, and performance. Include dimensioned outline plan and elevation drawings of engine generator set and other system components.

C. Test Results:

1. Certification of Torsional Vibration Compatibility: Conform to NEMA 110.
2. Factory Project-Specific Equipment Test Reports: For units to be shipped for this Project showing evidence of compliance with specified requirements.
3. Field Test Report.

D. Operation and Maintenance Data:

1. Detailed Operating Instructions: Describe operation under both normal and abnormal conditions.
2. Lists: Tools, test equipment, spare parts, and replacement items recommended to be stored at site for ready access. Include part and drawing numbers, current unit prices, and source of supply.

1.5 Guarantee

A. All electrical equipment shall be guaranteed from all defects of material and workmanship for the manufacturer's standard length of guarantee or for 1 year from the date of final acceptance, which is longer.

1.6 Delivery, Storage and Handling

A. Delivery, storage and handling shall be in accordance with Manufacturer’s manual.

1.7 Definitions

A. Emergency or Standby Rating: Power output rating equal to power that generator set delivers continuously under normally varying load factors for duration of power outage with capability of 24 continuous operating hours.

B. Operational Bandwidth: Total variation from lowest to highest value of parameter over range of conditions indicated, expressed as percentage of nominal value of parameter.

C. Power Output Rating: Gross electrical power output to generator set minus total power requirements of electric motor-driven accessories normally constituting part of engine assembly.

D. Steady-State Voltage Modulation: Uniform cyclical variation of voltage within operational bandwidth, expressed in Hz or cycles per second.

1.8 System Description

A. Design Requirements:

1. System Includes: Standby-rated, automatically started diesel engine coupled to ac generator unit. Engine and generator are factory-mounted and factory-aligned on structural steel skid. Subsystems and auxiliary components and equipment are as indicated.

2. Environmental Conditions: Engine generator system withstands following environmental conditions without mechanical or electrical damage or degradation of performance capability:
   a. Ambient Temperature: -30^0F to $+105^0$F.
   b. Altitude: Sea level to 1,000 ft.

B. Performance Requirements:

1. Functional Description: Switching “On-Off” switch on generator control to “On” position starts generator set. “Off” position of same switch initiates shutdown of unit. When unit is running, specified system or equipment failures or derangements automatically shut down unit and initiate alarms. Operation of remote emergency stop switch also shuts down unit.

2. System Performance:
   a. Steady-State Voltage Operational Bandwidth: 1% of rated output voltage from no load to full load.
   b. Steady-State Voltage Modulation: Less than 0.25 Hz.
   c. Transient Voltage Performance: Not more than 10% variation for 50% step-load increase or decrease. Voltage recovers to remain within steady-state operating band within 2 sec.
   d. Steady-State Frequency Operational Bandwidth: 0.5% of rated frequency from no load to full load.
   e. Steady-State Frequency Stability: When system is operating at constant load within rated load, there are no random speed variations outside steady-state operational band and no regular or cyclical hunting or surging of speed.
   f. Transient Frequency Performance: Less than 3 Hz variation for 50% step-load increase or decrease. Frequency recovers to remain within steady-state operating band within 3 sec.
   g. Output Waveform: At no load, harmonic content measures line-to-line or line-to-neutral does not exceed 5% total and 3% for single harmonics. Telephone influence factor determined according to NEMA MG1 does not exceed 50.
   h. Sustained Short-Circuit Current: For 3-ph bolted short circuit at system output terminals, system will supply minimum of 300% of rated full-load current for not less than 10 sec and then clear fault automatically, without damage to any generator system component.
   i. Temperature Rise of Generator: Within acceptable limits for insulation systems used according to NEMA MG1 when operating continuously at standby rating conditions. Temperature rise not to exceed 160^0 F over 105^0 F ambient.
   j. Nonlinear Load Performance: System performance is not degraded from that specified in this Article by continuous operation, with load current having minimum total harmonic content of 15% rms, and minimum single harmonic content of 10% rms.
   k. Starting Time: Maximum total time period for cold start, with ambient temperature at low end of specified range, is 10 sec. Time period includes output voltage and frequency settlement within specified steady-state bands.

1.9 Quality Assurance

A. Manufacturer Qualifications: Firms experienced in manufacturing equipment of types and capabilities indicated that have record of successful in-service performance.

1. Emergency Service: System manufacturer maintains service center capable of providing training, parts, and emergency maintenance and repairs at Project site within 4 hours maximum response time.

B. Comply with NFPA 70.

C. Engine Exhaust Emissions and Fuel System: Comply with applicable Federal, State, and local government requirements.

D. Permits: Provide required air permitting and fuel system permitting required in accordance with applicable Federal, State, and local government requirements.

E. Single-Source Responsibility: Obtain engine generator system components from single manufacturer with responsibility for entire system. Unit shall be representative product built from components that have proven compatibility and reliability and are coordinated to operate as unit as evidenced by records of prototype testing.

PART 2 - PRODUCTS:

2.1 Manufacturers

A. Engine Generator Sets:

1. Cummins Power Generation
2. Kohler Co.
3. Caterpillar
4. MTU Onsite Energy – Central Power Systems, St. Louis, MO

B. Engine Generator System:

1. System is coordinated assembly of compatible components.
2. Ratings: Coordinate with other equipment suppliers and size the generator to start one main pump, while the equipment listed in 2.1.B.3 Step 1, is operating. Minimum rating shall be 3-ph, 4-wire 277/480v, 60 Hz, 150 kW, 175 KVA.
3. Motor starting KVA of 350 minimum required to start and operate following load steps without exceeding 20% maximum voltage dip and with return to steady state in less than 2 sec.

    a. Step No.1 15 HP Low Flow Pump
    b. Step No.1 900 VA lighting at the station
    c. Step No.1 1 KVA UPS
    d. Step No.1 2 – 1/2 HP Exhaust Fan
    e. Step No.1 9 KW Unit Heater
    f. Step No.2 60 HP Main Pump
4. Safety Standard: Comply with ASME B15.1
5. Nameplates: Equip each major system component with conspicuous nameplate of component manufacturer. Nameplate identifies manufacturer of origin and address, and model and serial number of item.

C. Engine Generator Set:

1. Power Output Rating: Nominal ratings as indicated, with capacity as evidenced by records of prototype testing.
2. Skid: Welded steel base securely mounted with anchored mounting bolts. Adequate strength and rigidity to maintain alignment of mounted components without dependence on concrete foundation. Free from sharp edges and corners. Lifting attachments arranged to facilitate lifting with slings without damaging components.

3. Vibration Isolation: In accordance with Manufacturer's recommendations: Integral vibration isolators may be provided. When integral isolators are not provided, provide 95% efficient spring type vibration isolators. Mount isolators between steel base and concrete pad.
4. Rigging Diagram: Inscribed on metal plate permanently attached to skid. Diagram indicated location and lifting capacity of each lifting attachment and location of center of gravity.

D. Engine:

1. Comply with NFPA 37, NFPA 54.
2. Fuel: Natural gas.
3. Maximum Speeds:
    a. Engine: 1,800 rpm.
    b. Piston speed 4-cycles engines: 2,250 ft/min.

4. Lubrication Systems: Pressurized by positive displacement pump driven from engine crankshaft. Mount following items on engine or skid:

    a. Filter and Strainer: Rated to remove 90% of particles 5 microns and smaller while passing full flow.
    b. Oil Cooler: Maintains lubricating oil at manufacturer's recommended optimum temperature.
    c. Thermostatic Control Valve: Controls flow in system to maintain optimum oil temperature. Unit is capable of full flow and is designed to be fail-safe.
    d. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps or siphons or special tools or appliances.

5. Engine Fuel System: Comply with NFPA 37 and NFPA 54.

    a. Carburetor: Down draft type
    b. Gas Pressure Regulator and gas solenoid valve: Mounted on engine and shall be connected to the engine with a flexible gas connection, which shall be minimum 18" long and shall be recommended by the engine generator manufacturer. The solenoid valve coil shall be rated for generator starting battery voltage.

6. Jacket Coolant Heater: Electric immersion type, factory-installed in jacket coolant system. Unit is rated and thermostatically controlled to maintain an engine temperature of 77^0 F at low end of specified ambient temperature range.

    a. Voltage: 208V.
    b. Wattage: 2000W
    c. Quantity: 1.

7. Speed Governor: Adjustable isochronous type, with speed sensing.

8. Provide thermostatically controlled 120V, 100W oil pan heater and 120V, 100W battery jacket heater.

E. Engine Cooling System:

1. Closed-loop, liquid-cooled, with radiator factory-mounted on engine generator set skid and integral engine-driven coolant pumping.
2. Radiator Core Tubes: Nonferrous metal construction other than aluminum.
3. Size of Radiator: Adequate to contain expansion of total system coolant from start to 100% load condition.
4. Coolant: Solution of 50% ethylene glycol and 50% water.
5. Temperature Control: Self-contained thermostatic control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer. Features include:
   a. Thermostatic Elements: Interchangeable and nonadjustable.
   b. Actuator Design: Normally-open valves to return to open position when actuator fails.
6. Coolant Hose: Flexible assembly with nonporous rubber inside surface and aging, ultraviolet, and abrasion-resistant fabric outer covering:
   a. Rating: 50 psi maximum working pressure with 180^0 F coolant, and noncollapsible under vacuum.
   b. End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.

F. Fuel Supply System: Gas train, 11” to 15” water column pressure.

G. Engine Exhaust System:

1. Muffler: Industrial-type, sized as recommended by engine manufacturer. Measured sound level in 20-75 Hz frequency band, according to “DEMA Test Code for Measurement of Sound from Heavy-Duty Reciprocating Engines” at distance of 25 ft from exhaust discharge, is 87 dB or less.
2. Connections from Engine to Exhaust System: Furnish flexible section on corrugated stainless steel pipe with generator set.
3. Insulation for mufflers.
4. Supports for Muffler and Exhaust Piping: Vibrations isolating-type.

H. Starting System:

1. Description: 24 V electric with negative ground and including following items:

   a. Components: size so they will not be damaged during full engine-cranking cycle with specified maximum ambient temperature.
   b. Cranking Motor: Heavy-duty unit that automatically engaged and releases from engine flywheel without binding.
   c. Cranking Cycle: 60 sec.
   d. Battery complies with SAE J537 and has adequate capacity within ambient temperature range specified in Part 1 to provide specified cranking cycle series at least twice without recharging.
   e. Battery Cable: Size as recommended by generator set manufacturer for cable length required for connection to battery. Include required interconnecting conductors and connection accessories.

f. Battery Compartment: Factory-fabricated of metal with acid-resistant finish and thermal insulation. Thermostatically controller heater is arranged to maintain battery above 10 o C regardless of external ambient temperature within range specified in Part 1. Include accessories required to support and fasten batteries in place.
g. Battery-Charging Alternator: Factory-mounted on engine with solid-state voltage-regulation and 35 amp minimum continuous rating.
h. Battery Charger: Current limiting, automatic equalizing and float charging-type designed for operation from 120 v 60 Hz supply source. Unit shall comply with UL 508 and include the following features:

1) Operation: Equalizing charging rate of 10 amps is initiated automatically after battery has lost charge until adjustable equalizing voltage is achieved at battery terminals. Until then automatically switches to lower float-charging mode, and continues operating in that mode until battery is discharged again.
2) Automatic Temperature Compensation: Adjusts float and equalizes voltages for variations in ambient temperature from -40^0 C to +60^0 C to prevent overcharging at high temperatures and undercharging at low temperatures.
3) Automatic Voltage Regulation: Maintains output voltage constant regardless of input voltage variations up to +10%.
4) Ammeter and Voltmeter: Flush mounted in door. Meters indicate charging rates.
5) Safety Functions: Include sensing of abnormally low battery voltage arranged to close contacts providing “low battery voltage” indication on control and monitoring panel. Also include sensing of high battery voltage and loss of ac input or dc output of battery charger. Either of these conditions closes contacts that provide “battery charger malfunction” indication at system control and monitoring panel.
6) Enclosure and Mounting: NEMA Class 1 wall-mounted cabinet.

I. Control and Monitoring:

1. Operating and safety indications, protective devices, basic system controls, and engine gages are grouped on common control and monitoring panel mounted on generator set. Mounting method isolates control panel from generator set vibration.

a. Generator Circuit Breaker: Molded case type conforming to Section 160010, sub-section 2.8. Trip rating based on generator full load current.
b. Shunt Trip Device: For generator breaker, connected to trip breaker when generator set is shut down by protective devices.
c. Current and Potential Transformers: Instrument accuracy class.

2. Indicating and Protective Devices, and Controls: Include those required by NFPA 110 for Level 2 system plus following:

    a. AC Voltmeter.
    b. AC Ammeter.
    c. AC Frequency Meter.
    d. DC Voltmeter (Alternator Battery Charging).
    e. Engine Coolant Temperature Gage.
    f. Engine-Lubricating Oil Pressure Gage.
    g. Running Time Meter.
    h. Ammeter/Voltmeter Phase Selector Switch or Switches.
    i. Generator Voltage-Adjusting Rheostat.
    j. Frequency Adjusting Rheostat.

3. Supporting Items: Include sensors, transducers, terminals, relays, and other devices, and wiring required to support specified items. Locate sensors and other supporting items on engine, generator, or elsewhere as indicated. Where not indicated, locate to suit manufacturer's standard.

4. Common Remote Audible Alarms: Conform to NFPA 110 requirements for Level 1 systems. Include necessary contacts and terminals in control and monitoring panel. Provide audible device at the generator and a silencing means inside the generator control panel..
    a. High Engine Temperature Shutdown.
    b. Low-Lube Oil Pressure Shutdown.
    c. Overspeed Shutdown.
    d. Remote Emergency Stop Shutdown.
    e. High Engine Temperature Pre-alarm.
    f. Low-Lube Oil Pressure Pre-alarm.
    g. Low Fuel Pressure Alarm.
    h. Separate terminal block factory-wired to Form C dry contacts for each alarm.

J. Generator, Exciter, and Voltage Regulator:

1. Comply with NEMA MG 1 and specified performance requirements.
2. Drive: Generator shaft is directly coupled to engine shaft. Exciter is rotated integrally with generator rotor.
3. Electrical Insulation: Class H or Class F.
4. Stator Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.
5. Construction prevents mechanical, electrical, and thermal damage due to vibration, overspeed up to 125% of rating, and heat during operation at 100% of rated speed.
6. Excitation uses no-slip or collector rings, or brushes, and is arranged to sustain generator output under short circuit conditions as specified.
7. Enclosure: Dripproof.
8. Instrument Transformers: Mounted within generator enclosure.

9. Voltage Regulator: Solid-state-type, separate from exciter, providing performance as specified:
a. Adjusting rheostat on control and monitoring panel provided +5% adjustment of output voltage operating band.
10. Surge Protection: Conform to UL 1449. Mount suppressors in generator enclosure and connect to load terminals.
11. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.

K. Outdoor Generator Set Enclosure:

1. Description: Weatherproof steel housing. Multiple panels are lockable and provide adequate access to components requiring maintenance. Panels are removable by one person without tools. Enclosure shall be sized to allow access to components requiring maintenance.
2. Fixed Louvers: At air inlet and discharge. Louvers prevent entry of rain and snow.
3. Automatic Dampers: At air inlet and discharge. Dampers are closed to reduce engine and battery heat loss in cold weather when unit is not operating.
4. Air Flow Through Housing: Adequate to maintain temperature rise of system components within required limits.
5. Muffler/Silencer mounted inside of enclosure.
6. Light fixtures with wire guards shall be provided inside enclosure. Fixtures shall be factory wired to a light switch. Coordinate light switch position with access panels and locate near generator control panel.
7. Two duplex receptacles shall be provided inside enclosure. One receptacle shall be located next to light switch with the second located on the opposite side of the enclosure near an access panel.
8. The engine generator set’s auxiliary devices such as battery charger, jacket water heaters, lighting, maintenance receptacles, etc shall be powered by four single phase circuits from the auxiliary power panel, 120/208 3-phase, in the pump station. Devices within enclosure and provided with generator set shall be wired to the auxiliary power panel as shown on plan sheet E-11.

L. Finishes:

1. Outdoor Enclosures: Polyurethane enamel over corrosion-resistant pretreatment and manufacturer’s compatible standard primer.

M. Source Quality Control:

1. Factory Tests: Include prototype testing and Project-specific equipment tests (equipment manufactured specifically for this Project).

2. Project-Specific Factory Equipment Tests: Test engine generator set and other system components and accessories prior to shipment. Test items individually and assembled and connected as complete system at factory in manner equivalent to that required at Project site. Record and report test data. Conform to SAE 8528 and following:
   a. Test Equipment: Use instruments calibrated within previous 12 mos. and with accuracy directly traceable to National Institute of Standards and Technology (NIST).
   b. Hydrostatic Test: Perform on radiator, heat exchanger, and engine water jacket.
   c. Generator Tests: Conform to IEEE 115.
   d. Complete System Continuous Operation Test: Includes nonstop operation for minimum standard factory test, including at least 1 hr. at 50% and 75%, and 2 hrs. at 100% of full load. If unit stops during standard factory test, repeat complete test. Record following minimum data at start and end of each load run, at 15 min intervals between those times and at 15 min intervals during balance of test:
      1) Fuel consumption.
      2) Exhaust temperature.
      3) Jacket water temperature.
      4) Lubricating oil temperature and pressure.
      5) Generator load current and voltage, each phase.
      6) Generator system gross and net output kW.
   e. Complete System Performance Tests: Include following to demonstrate conformance to specified performance requirements:
      1) Single-step load pickup.
      2) Transient and steady-state governing.
      3) Transient and steady-state voltage performance.
      4) Safety shutdown devices.
   f. Observation of Factory Test: Provide 2 week advance notice of tests and opportunity for observation of test by Engineer.
   g. Report rest results within 10 days of completion of tests.

N. Special Tools and Spare Parts to be Furnished:

1. One set of all special tools that are required for the normal operation and maintenance of the engine generator unit.
2. Two complete spare replacement sets of all filter elements required for the generator unit.
3. Three complete replacement sets of each type and size of fuses.
4. Two complete replacement sets of each type of indicating lamps.

PART 3 - EXECUTION:

3.1 Examination

A. Verify location and layout of Engine Generator Set.

B. Verify that gas service is available and of correct characteristics.

3.2 Preparation

A. Install concrete pad after dimensions of equipment are confirmed by equipment manufacturers.

3.3 Installation

A. Anchor generator set and other system components on concrete pad as indicated. Provide anchorage and vibration isolation according to manufacturer's recommendations.

B. Maintain minimum working space around components according to manufacturer's approved submittals and NEC.

3.4 Cleaning

A. Upon completion of installation, inspect system components. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish. Clean components internally using methods and materials recommended by manufacturer.

3.5 Field Quality Control

A. Manufacturer's Field Services:

1. The services of a qualified representative of the manufacturer shall be provided to instruct on proper installation of the equipment, inspect the completed installation, make any necessary adjustments, participate in the startup of the equipment, participate in the field testing of the equipment, place the equipment in trouble-free operation, and instruct operating personnel in its operation and maintenance. Include minimum:
   a. 1 man-day for Installation Services.
   b. 1/2 man-day for Instructional Services.
   c. 1/2 man-day for Post Startup Services.
2. Supplier or manufacturer shall direct services to system and equipment operation, maintenance, troubleshooting, and equipment and system related areas.
3. In addition to the services specified above, provide manufacturer's services as required to successfully complete systems demonstration.
4. The start-up services for the Engine Generator System shall be coordinated with Engineer, who shall be notified at least one week in advance.

B. Tests: Provide services of qualified testing agency to perform tests listed below according to manufacturer's recommendations upon completion of installation of system. Use instruments bearing records of calibration within last 12 mos., traceable to NIST standards, and adequate for making positive observation of test results. Include following tests:

1. Battery Tests: Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions. Test for contact integrity of connectors.
2. Battery Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.

3. System Integrity Tests: Verify proper installation, connection, and integrity of each element of engine generator system before and during system operation. Check for air, exhaust, and fluid leaks.
4. Simulation of malfunctions to verify proper operation of local and remote protective, alarm, and monitoring devices.
5. Load Test: Use variable load bank capable of simulating kVA, kW, and power factor of load for which unit is rated. Run unit at 25, 50, and 75% of rated capacity for 30 min each, and at 100% for 1 hrs. Record voltage, frequency, load current, battery-charging current, power output, oil pressure, and coolant temperature during test.
6. Exhaust System Back-Pressure Test: Use manometer with scale exceeding 40 in. of water. Connect to exhaust line close to engine exhaust manifold. Verify that back pressure at full-rated load is within manufacturer's published allowable limits for engine.
7. Exhaust Emissions Test: Conform to applicable government test criteria.

C. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

END OF SECTION 160030

DRAINAGE SYSTEM
Effective : June 10, 1994
Revised: January 1, 2007

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

Material. The pipe and fittings shall be reinforced fiberglass according to ASTM D 2996 RTRP with a 30,000 psi (207 MPa) minimum short-time rupture strength hoop tensile stress. The reinforced fiberglass shall also have an apparent stiffness factor at 5 percent deflection exceeding 200 cu in.-lbf/sq. in. (22.6 cu mm-kPa) and a minimum wall thickness of 0.10 in. (2.54 mm). All pipe supports and associated hardware shall be hot dip galvanized according to AASHTO M 232 (M 232M). The fiberglass pipe and fittings furnished shall be pigmented through out, or have a resin-rich pigmented exterior coat, specifically designed for overcoating fiberglass, as recommended by the manufacturer. The color shall be as specified by the Engineer. The resin in either case shall have an ultraviolet absorber designed to prevent ultraviolet degradation. The supplier shall certify the material supplied meets or exceeds these requirements.

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

Installation. All connections of pipes and fittings shown on the plans to facilitate future removal for maintenance cleanout or flushing shall be made with a threaded, gasketed coupler or a bolted gasketed flange system. Adhesive bonded joints will be permitted for runs of pipe between such connections. The end run connection shall feature a minimum nominal 6 in. (150 mm) female threaded fiberglass outlet. Straight runs may utilize a 45 degree reducing saddle bonded to the pipe. The female outlet shall be filled with a male threaded PVC plug.

Runs of pipe shall be supported at spacings not exceeding those recommended by the manufacturer of the pipe. Supports that have point contact or narrow supporting areas shall be avoided. Standard slings, clamps, clevis hangers and shoe supports designed for use with steel pipe may be used. A minimum strap width for hangers shall be 1 1/2 in. (40 mm) for all pipe under 12 in. (300 mm) in diameter and 2 in. (50 mm) for diameters 12 in. (300 mm) or greater. Straps shall have 120 degrees of contact with the pipe. Pipes supported on less than 120 degrees of contact shall have a split fiberglass pipe protective sleeve bonded in place with adhesive.

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

Basis of Payment. This work will be paid for at the contract lump sum price for DRAINAGE SYSTEM.

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(l) 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 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.

MODULAR EXPANSION JOINT
Effective: May 19, 1994
Revised: April 18, 2014

Description. This work shall consist of furnishing and installing a modular expansion joint(s) as shown on the plans, and according to applicable portions of the Standard Specifications.

General. The expansion joint device shall be capable of handling the specified longitudinal movement. In addition, when specified, the joint shall also be capable of handling the differential non-parallel longitudinal movement. The expansion joint device shall effectively seal the joint opening in the deck surface and barrier curbs against the entrance of water and foreign materials. There shall be no appreciable change in the deck surface plane with the expansion and contraction movements of the bridge.

The device shall consist of a shop-fabricated modular assembly of transverse neoprene seals, edge and separation beams, bearing on support bars spanning the joint opening. The assembly shall maintain equal distances between intermediate support rails, at any cross section, for the entire length of the joint. The assembly shall be stable under all conditions of expansion and contraction, using a system of longitudinal control springs and upper and lower support beam bearings and springs.

At sidewalks, concrete median barriers and concrete parapet joints, a sliding steel plate shall be fabricated and installed according to the plans. Painting or galvanizing of sliding steel plates shall be as specified on the plans.

The expansion joint system options shall be limited to the following pre-approved systems:

For Modular Expansion Joints:
- Steelflex system, by the D.S. Brown Company
- WABO system, by the Watson Bowman Acme Corporation
- LR System, by TechStar Incorporated

For Swivel Modular Expansion Joints:
- MAURER Swivel system, by the D.S. Brown Company
- WABO X-CEL system, by the Watson Bowman Acme Corporation
- LG Swivel System, by TechStar Incorporated

Pre-approval of the expansion joint system does not include material acceptance at the jobsite.

Submittals: Shop drawings and a copy of the calculations and support documents shall be submitted to the Engineer for approval according to Article 105.04 of the Standard Specifications. Submittals will be required for each modular expansion joint device specified. In addition the Contractor shall provide the Department with a certification of compliance by the manufacturer listing all materials in the system. The certification shall attest that the system conforms to the design and material requirements and be supported by a copy of the successful results of the fatigue tests performed on the system as herein specified. Submittals with insufficient test data and supporting certifications will be rejected.

The shop drawings shall include tables showing the total anticipated movements for each joint and the required setting width of the joint assemblies at various temperatures.

Design Requirements: The maximum vertical, transverse and horizontal rotations and displacements shall be defined and included in the design.

The expansion joint device(s) shall be designed, detailed and successfully tested, for non AASHTO LRFD designed structures, according to the requirements specified in NCHRP Report 402 “Fatigue Design of Modular Bridge Expansion Joints” and NCHRP Report 467 “Performance Testing for Modular Bridge Joint Systems” and for LRFD designed structures according Section 14 of the AASHTO LRFD Bridge Design Specifications.

Top, bottom and sides of support bars shall be restrained to prevent uplift, transmit bearing loads, and maintain the lateral position of the bars.

The total movement of each individual sealing element shall not exceed 3 in. (75 mm).

Materials:

(a) Metals. Structural Steel. All structural steel shall be according to AASHTO M 270, Grade 50 (M 270M Grade 345), unless otherwise specified.

Stainless steel sheets for the sliding surfaces of the support bars shall conform to the requirements of ASTM A240 (A240M) type 302 or 304.

The use of aluminum components in the modular joint will not be allowed.

(b) Preformed Elastomeric Seals. The elastomeric sealing element shall be according to ASTM D5973.

Lubricant/Adhesive for installing the preformed elastomeric elements in place shall be a one-part, moisture-curing, polyurethane and hydrocarbon solvent mixture as recommended by the manufacturer and containing not less than 65 percent solids.

(c) Support Bar Bearings. Support bar bearings shall be fabricated from elastomeric pads with polytetrafluorethylene (PTFE) surfacing or from polyurethane compound with PTFE sliding surfaces. The elastomeric and PTFE materials shall meet the requirements of Section 1083 of the Standard Specifications.

(d) Control Springs. Suitable elastomeric type springs which work longitudinally shall be used to maintain the equidistant spacing between transverse edge and separation beams when measured at any given cross section through the joint.

(e) Support Bars. Support bars shall incorporate stainless steel sliding surfaces to permit joint movement.

Construction Requirements

General. Installation of expansion devices shall be according to the plans and shop drawings.

The fabricator of the modular joint assembly shall be AISC certified according to Article 106.08 for Bridge and Highway Metal Component Manufacturers. In lieu of AISC certification, the Contractor may have all welding on main members (support bars and separation beams) observed and inspected by independent (third party) personnel at the Contractor's expense. Welding shall then be observed by a Certified Welding Inspector (CWI) in addition to the manufacturer's own welding inspection. Third party Non Destructive Examination (NDE) shall be performed by inspector(s), certified as level II in applicable methods, and all complete penetration beam-to-bar welds and butt joints in beams shall be UT inspected and 10 percent of fillets and partial pen welds shall be MT inspected.

The manufacturer of the expansion device shall provide a qualified technical service representative to supervise installation. Modular expansion joint devices shall be factory prefabricated assemblies, preset by the manufacturer prior to shipment with provisions for field adjustment for the ambient temperature at the time of installation.

Unless otherwise shown on the plans, the neoprene seals shall be continuous without any field splices.

All steel surfaces of the prefabricated assembly shall be shop painted with the primer specified for structural steel, except areas in direct contact with the seals, galvanized items and stainless steel surfaces.

The metal surfaces in direct contact with the neoprene seals shall be blast cleaned to permit a high strength bond of the lubricant/adhesive between the neoprene seal and mating metal surfaces.

The Contractor shall anticipate and make all necessary adjustments to existing or plan-specified reinforcement bars, subject to the approval of the Engineer, in order to prevent interferences with placement of the selected joint in the structure. Any adjustments to reinforcement bars interfering with the joint installation shall be the responsibility of the Contractor and preapproved by the Engineer prior to installation of the joint. Cutting of reinforcement shall be minimized, and any bars that are cut shall be replaced in-kind at no additional cost.

The prefabricated joint assembly shall be properly positioned and attached to the structure according to the manufacturer's approved shop drawings. The attachment shall be sufficiently rigid to prevent non-thermal rotation, distortion, or misalignment of the joint system relative to the deck prior to casting the concrete. The joints shall be adjusted to the proper opening based on the ambient temperature at the time of installation and then all restraints preventing thermal movement shall be immediately released and/or removed. The joint assembly units shall be straight, parallel and in proper vertical alignment or reworked until proper adjustment is obtained prior to casting of the concrete around the joint.

After the joint system is installed, the joint area shall be flooded with water and inspected, from below for leakage. If leakage is observed, the joint system shall be repaired, at the expense of the Contractor, as recommended by the manufacturer and approved by the Engineer.

Method of Measurement. This work will be measured for payment in place, in feet (meters), along the centerline of the joint from face to face of the parapets or curbs. All sliding plate assemblies at the sidewalks, parapets and median barriers will not be measured for payment. The size will be defined as the specified longitudinal movement rounded up to the nearest 3 inch (75 mm) increment.

Basis of Payment: When only a longitudinal movement is specified, this work will be paid for at the contract unit price per foot (meter) for the MODULAR EXPANSION JOINT, of the size specified. When a differential non parallel movement is also specified, this work will be paid for at the contract unit price per foot (meter) for the MODULAR EXPANSION JOINT-SWIVEL, of the size specified.

All materials, equipment and labor required to fabricate, paint and install the sliding plate assemblies at the sidewalks, parapets and median barriers will not be paid for separately but shall be included in the price for the expansion joint specified.

When the fabrication and erection of modular expansion joint is accomplished under separate contracts, the applicable requirements of Article 505.09 shall apply, except the furnishing pay items shall include storage and protection of fabricated materials up to 75 days after the completion dates.

Fabricated modular expansion joints and other materials complying with the requirements of this item, furnished and accepted, will be paid for at the contract unit price per foot (meter) for FURNISHING MODULAR EXPANSION JOINT or FURNISHING MODULAR EXPANSION JOINT – SWIVEL of the size specified.

Storage and care of fabricated joints 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 MODULAR EXPANSION JOINTS 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.

Modular expansion joints and other materials erected according to the requirements of the specifications, and accepted, will be paid for at the contract unit price per foot (meter) for ERECTING MODULAR EXPANSION JOINT or ERECTING MODULAR EXPANSION JOINT - SWIVEL of the size specified.

DECK SLAB REPAIR
Effective: May 15, 1995
Revised: October 15, 2011

This work shall consist of hot-mix asphalt surface removal, when required, the removal and disposal of all loose and deteriorated concrete from bridge deck and the replacement with new concrete to the original top of deck. The work shall be done according to the applicable requirements of Sections 501, 503 and 1020 of the Standard Specifications and this Special Provision.

Deck slab repairs will be classified as follows:

(a) Partial-Depth. Partial-depth repairs shall consist of removing the loose and unsound deck concrete, disposing of the concrete removed and replacing with new concrete. The removal may be performed by chipping with power driven hand tools or by hydro-scarification equipment. The depth shall be measured from the top of the concrete deck surface, at least 3/4 in. (20 mm) but not more than 1/2 the concrete deck thickness.

(b) Full-Depth. Full-depth repairs shall consist of removing concrete full-depth of the deck, disposing of the concrete removed, and replacing with new concrete to the original concrete deck surface. The removal may be performed with power driven hand tools, hydraulic impact equipment, or by hydro-scarification equipment. Full-depth repairs shall be classified for payment as Full-Depth, Type I and Full-Depth, Type II according to the following:

Type I Full-depth patches less than or equal to 5 sq. ft. (0.5 sq m) in area. The minimum dimensions for a patch shall be 1 ft. x 1 ft. (300 mm x 300 mm).

Type II Full-depth patches greater than 5 sq. ft. (0.5 sq. m) in area.

Materials.

Materials shall be according to Article 1020.02.

Portland cement concrete for partial and full-depth repairs shall be according to Section 1020. Class PP-1, PP-2, PP-3, PP-4, PP-5 or BS concrete shall be used at the Contractor's option unless noted otherwise on the contract plans. For Class BS concrete, a CA 13, 14, or 16 shall be used. If the BS concrete mixture is used only for full depth repairs, a CA-11 may be used.

Equipment:

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

(a) Surface Preparation Equipment. Surface preparation and concrete removal equipment shall be according to the applicable portions of Section 1100 and the following:

(1) Sawing Equipment. Sawing equipment shall be a concrete saw capable of sawing concrete to the specified depth.

(2) Blast Cleaning Equipment. The blast cleaning may be performed by wet sandblasting, high-pressure waterblasting, shotblasting or abrasive blasting. Blast cleaning equipment shall be capable of removing rust and old concrete from exposed reinforcement bars, and shall have oil traps.

(3) Power-Driven Hand Tools. Power-driven hand tools will be permitted including jackhammers lighter than the nominal 45 lb. (20 kg) class. Chipping hammers heavier than a nominal 15 lb. (6.8 kg) class shall not be used for removing concrete from below any reinforcing bar for partial depth repairs, or for removal within 1 ft (300 mm) of existing beams, girders or other supporting structural members that are to remain in service or within 1 ft (300 mm) of the boundaries of full-depth repairs. Jackhammers or chipping hammers shall not be operated at an angle in excess of 45 degrees measured from the surface of the slab.

(4) Hydraulic Impact Equipment. Hydraulic impact equipment with a maximum rated striking energy of 360 ft-lbs (270 J) may be permitted only in areas of full depth removal more than 1 ft (300 mm) away from existing beams, girders or other supporting structural members that are to remain in service or more than 1 ft (300 mm) from the boundaries of full-depth repairs.

(5) Hydro-Demolition Equipment. The hydro-demolition equipment shall consist of filtering and pumping units operating with a remote-controlled robotic device. The equipment shall use water according to Section 1002. The equipment shall be capable of being controlled to remove only unsound concrete.

(b) Concrete Equipment: Equipment for proportioning and mixing the concrete shall be according to Article 1020.03.

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

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

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

(a) Hot-Mix Asphalt Surface Removal.

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

(b) Surface Preparation:

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

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

(1) Partial-Depth. Areas to be repaired will be determined and marked by the Engineer. A concrete saw shall be used to provide vertical edges approximately 3/4 in. (20 mm) deep around the perimeter of the area to be patched when a concrete overlay is not specified. Where high steel is present, the depth may be reduced as directed by the Engineer. A saw cut will not be required on those boundaries along the face of the curb, parapet or joint or when sharp vertical edges are provided by hydro-demolition.

The loose and unsound concrete shall be removed by chipping, with power driven hand tools or by hydro-demolition equipment. All exposed reinforcing bars and newly exposed concrete shall be thoroughly blast cleaned. Where, in the judgment of the Engineer, the bond between existing concrete and reinforcement steel within the patch area has been destroyed, the concrete adjacent to the bar shall be removed to a depth that will permit new concrete to bond to the entire periphery of the exposed bar. A minimum of 1 in. (25 mm) clearance will be required. The Engineer may require enlarging a designated removal area should inspection indicate deterioration beyond the limits previously designated. In this event, a new saw cut shall be made around the extended area before additional removal is begun. The removal area shall not be enlarged solely to correct debonded reinforcement or deficient lap lengths.

(2) Full-Depth. Concrete shall be removed as determined by the Engineer within all areas designated for full-depth repair and in all designated areas of partial depth repair in which unsound concrete is found to extend below half the concrete deck thickness. Full depth removal shall be performed according to Article 501.05 except that hydraulic impact equipment may be permitted in areas of full depth removal more than 1 ft (300 mm) away from the edges of existing beams, girders or other supporting structural members or more than 1 ft (300 mm) from the boundaries of full-depth repairs. Saw cuts shall be made on the top of the deck, except those boundaries along the face of curbs, parapets and joints or where hydro-demolition provided sharp vertical edges. The top saw cut may be omitted if the deck is to receive an overlay.

Forms for full-depth repair may be supported by hangers with adjustable bolts or by blocking from the beams below. When approved by the Engineer, forms for Type 1 patches may be supported by No. 9 wires or other devices attached to the reinforcement bars.

All form work shall be removed after the curing sequence is complete and prior to opening to traffic.

(3) Reinforcement Treatment. Care shall be exercised during concrete removal to protect the reinforcement bars and structural steel from damage. Any damage to the reinforcement bars or structural steel to remain in place shall be repaired or replaced. All existing reinforcement bars shall remain in place except as herein provided for corroded bars. Tying of loose bars will be required. Reinforcing bars which have been cut or have lost 25 percent or more of their original cross sectional area shall be supplemented by new in kind reinforcement bars. New bars shall be lapped a minimum of 32 bar diameters to existing bars. An approved mechanical bar splice capable of developing in tension at least 125 percent of the yield strength of the existing bar shall be used when it is not feasible to provide the minimum bar lap. No welding of bars will be permitted.

(4) Cleaning. Immediately after completion of the concrete removal and reinforcement repairs, the repair areas shall be cleaned of dust and debris. Once the initial cleaning is completed, the repair areas shall be thoroughly blast cleaned to a roughened appearance free from all foreign matter. Particular attention shall be given to removal of concrete fines. Any method of cleaning which does not consistently produce satisfactory results shall be discontinued and replaced by an acceptable method. All debris, including water, resulting from the blast cleaning shall be confined and shall be immediately and thoroughly removed from all areas of accumulation. If concrete placement does not follow immediately after the final cleaning, the area shall be carefully protected with well-anchored polyethylene sheeting.

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

(c) Placement & Finishing of Concrete Repair:

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

(2) Concrete Placement.

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

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

(d) Curing and Protection.

Concrete patches shall be cured by the Wetted Burlap or Wetted Cotton Mat Method according to Article 1020.13 (a)(3) or Article 1020.13 (a)(5). The curing period shall be 3 days for Class PP-1, PP-2, PP-3, PP-4, and PP-5 concrete. The curing period shall be 7 days for Class BS concrete. In addition to Article 1020.13, when the air temperature is less than 55º F (13º C), the Contractor shall cover the patch according to Article 1020.13 (d)(1) with minimum R12 insulation. Insulation is optional when the air temperature is 55º F. - 90º F (13º C - 32º C). Insulation shall not be placed when the air temperature is greater than 90° F (32° C). A 72-hour minimum drying period shall be required before placing waterproofing or hot-mix asphalt surfacing.

(e) Opening to Traffic.

No traffic will be permitted on a patch until after the specified cure period, and the concrete has obtained a minimum compressive strength of 4000 psi (27.6 MPa) or flexural strength of 675 psi (4.65 MPa).

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

Method of Measurement.

When specified, hot-mix asphalt surface removal and full or partial depth repairs will be measured for payment and computed in square yards (square meters).

Basis of Payment.

The hot-mix asphalt surface removal will be paid for at the contract unit price per square yard (square meter) for HOT-MIX ASPHALT SURFACE REMOVAL (DECK). Areas removed and replaced up to and including a depth of half the concrete deck thickness will be paid for at the contract unit price per square yard (square meter) for DECK SLAB REPAIR (PARTIAL). Areas requiring removal greater than a depth of half the concrete deck thickness shall be removed and replaced full depth and will be paid for at the contract unit price per square yard (square meter) for DECK SLAB REPAIR (FULL DEPTH, TYPE I) and/or DECK SLAB REPAIR (FULL DEPTH, TYPE II).

When corroded reinforcement bars are encountered in the performance of this work and replacement is required, the Contractor will be paid according to Article 109.04.

No payment will be allowed for removal and replacement of reinforcement bars damaged by the Contractor in the performance of his/her work or for any increases in dimensions needed to provide splices for these replacement bars.

Removal and disposal of asbestos waterproofing and/or asbestos bituminous concrete will be paid for as specified in the Special Provision for “Asbestos Waterproofing Membrane or Asbestos Hot-Mix Asphalt Surface Removal”.

TEMPORARY SHEET PILING
Effective: September 2, 1994
Revised: January 31, 2012

Description. This work shall consist of furnishing, driving, adjusting for stage construction when required and subsequent removal of the sheet piling according to the dimensions and details shown on the plans and according to the applicable portions of Section 512 of the Standard Specifications.

This work shall also include furnishing, installing and subsequent removal of all miscellaneous steel shapes, plates and connecting hardware when required to attach the sheeting to an existing substructure unit and/or to facilitate stage construction.

General. The Contractor may propose other means of supporting the sides of the excavation provided they are done so at no extra cost to the department. If the Contractor elects to vary from the design requirements shown on the plans, the revised design calculations and details shall be submitted to the Engineer for approval. The calculations shall be prepared and sealed by an Illinois Licensed Structural Engineer. This approval will not relieve the Contractor of responsibility for the safety of the excavation. Approval shall be contingent upon acceptance by all involved utilities and/or railroads.

Material. The sheet piling shall be made of steel and may be new or used material, at the option of the Contractor. The sheet piling shall have a minimum section modulus as shown on the plans or in the approved Contractor's alternate design. The sheeting shall have a minimum yield strength of 38.5 ksi (265 MPa) unless otherwise specified. The sheeting, used by the Contractor, shall be identifiable and in good condition free of bends and other structural defects. The Contractor shall furnish a copy of the published sheet pile section properties to the Engineer for verification purposes. The Engineer's approval will be required prior to driving any sheeting. All driven sheeting not approved by the Engineer shall be removed at the Contractor's expense.

Construction. The Contractor shall verify locations of all underground utilities before driving any sheet piling. Any disturbance or damage to existing structures, utilities or other property, caused by the Contractor's operation, shall be repaired by the Contractor in a manner satisfactory to the Engineer at no additional cost to the Department. The Contractor shall be responsible for determining the appropriate equipment necessary to drive the sheeting to the tip elevation(s) specified on the plans or according to the Contractor's approved design. The sheet piling shall be driven, as a minimum, to the tip elevation(s) specified, prior to commencing any related excavation. If unable to reach the minimum tip elevation, the adequacy of the sheet piling design will require re-evaluation by the Department prior to allowing excavation adjacent to the sheet piling in question. The Contractor shall not excavate below the maximum excavation line shown on the plans without the prior permission of the Engineer. The sheet piling shall remain in place until the Engineer determines it is no longer required.

The sheet piling shall be removed and disposed of by the Contractor when directed by the Engineer. When allowed, the Contractor may elect to cut off a portion of the sheet piling leaving the remainder in place. The remaining sheet piling shall be a minimum of 12 in. (300 mm) below the finished grade or as directed by the Engineer. Removed sheet piling shall become the property of the Contractor.

When an obstruction is encountered, the Contractor shall notify the Engineer and upon concurrence of the Engineer, the Contractor shall begin working to break up, push aside, or remove the obstruction. An obstruction shall be defined as any object (such as but not limited to, boulders, logs, old foundations etc.) where it's presence was not obvious or specifically noted on the plans prior to bidding, that cannot be driven through or around with normal driving procedures, but requires additional excavation or other procedures to remove or miss the obstruction.

Method of Measurement. The temporary sheet piling will be measured for payment in place in square feet (square meter). Any temporary sheet piling cut off, left in place, or driven to dimensions other than those shown on the contract plans without the written permission of the Engineer, shall not be measured for payment but shall be done at the contractor's expense.

If the Contractor is unable to drive the sheeting to the specified tip elevation(s) and can demonstrate that any further effort to drive it would only result in damaging the sheeting, then the Contractor shall be paid based on the plan quantity of temporary sheeting involved. However, no additional payment will be made for any walers, bracing, or other supplement to the temporary sheet piling, which may be required as a result of the re-evaluation in order to insure the original design intent was met. Portions of the temporary sheet piling left in place for reuse in later stages of construction shall only be measured for payment once.

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

Payment for any excavation performed in conjunction with this work will not be included in this item but shall be paid for as specified elsewhere in this contract.

Obstruction mitigation shall be paid for according to Article 109.04 of the Standard Specifications.

MECHANICALLY STABILIZED EARTH RETAINING WALLS
Effective: February 3, 1999 Revised: August 29, 2014

Description. This work shall consist of preparing the design, furnishing the materials, and constructing the mechanically stabilized earth (MSE) retaining wall to the lines, grades and dimensions shown in the contract plans and as directed by the Engineer.

General. The MSE wall consists of a concrete leveling pad, precast concrete face panels, a soil reinforcing system, select fill and concrete coping (when specified). The soil reinforcement shall have sufficient strength, quantity, and pullout resistance, beyond the failure surface within the select fill, as required by design. The material, fabrication, and construction shall comply with this Special Provision and the requirements specified by the supplier of the wall system selected by the Contractor for use on the project.

The MSE retaining wall shall be one of the following pre-approved wall systems:

Company Name: Wall System
Earth Tec International, LLC: EarthTrac HA
Sanders Pre-Cast Concrete Systems Company: Sanders MSE Wall
Shaw Technologies: Strengthened Soil
Sine Wall, LLC: Sine Wall
SSL Construction Products: MSE Plus
Vist-A-Wall Systems, LLC: Vist-A-Wall
Tensar Earth Technologies : ARES Wall
The Reinforced Earth Company: GeoMega System
The Reinforced Earth Company: Reinforced Earth
The Reinforced Earth Company: Retained Earth
Tricon Precast: Tricon Retained Soil
Tricon Precast: Tri-Web Retained Soil

Pre-approval of the wall system does not include material acceptance at the jobsite.

Submittals. The wall system supplier shall submit complete design calculations and shop drawings to the Engineer according to Article 1042.03(b) of the Standard Specifications no later than 90 days prior to beginning construction of the wall. No work or ordering of materials for the structure shall be done by the Contractor until the submittal has been approved in writing by the Engineer. All submittals shall be sealed by an Illinois Licensed Structural Engineer and shall include all details, dimensions, quantities and cross sections necessary to construct the wall and shall include, but not be limited to, the following items:

(a) Plan, elevation and cross section sheet(s) for each wall showing the following:

(1) A plan view of the wall indicating the offsets from the construction centerline to the face of the wall at all changes in horizontal alignment. The plan view shall show the limits of soil reinforcement and stations where changes in length and/or size of reinforcement occur. The centerline shall be shown for all drainage structures or pipes behind or passing through and/or under the wall.

(2) An elevation view of the wall indicating the elevations of the top of the panels. These elevations shall be at or above the top of exposed panel line shown on the contract plans. This view shall show the elevations of the top of the leveling pads, all steps in the leveling pads and the finished grade line. Each panel type, the number, size and length of soil reinforcement connected to the panel shall be designated. The equivalent uniform applied service (unfactored) nominal bearing pressure shall be shown for each designed wall section.

(3) A listing of the summary of quantities shall be provided on the elevation sheet of each wall.

(4) Typical cross section(s) showing the limits of the reinforced select fill volume included within the wall system, soil reinforcement, embankment material placed behind the select fill, precast face panels, and their relationship to the right-of-way limits, excavation cut slopes, existing ground conditions and the finished grade line.

(5) All general notes required for constructing the wall.

(b) All details for the concrete leveling pads, including the steps, shall be shown. The top of the leveling pad shall be located at or below the theoretical top of the leveling pad line shown on the contract plans. The theoretical top of leveling pad line shall be 3.5 ft. (1.1 m) below finished grade line at the front face of the wall, unless otherwise shown on the plans.

(c) Where concrete coping or barrier is specified, the panels shall extend up into the coping or barrier as shown in the plans. The top of the panels may be level or sloped to satisfy the top of exposed panel line shown on the contract plans. Cast-in-place concrete will not be an acceptable replacement for panel areas below the top of exposed panel line. As an alternative to cast in place coping, the Contractor may substitute a precast coping, the details of which must be included in the shop drawings and approved by the Engineer.

(d) All panel types shall be detailed. The details shall show all dimensions necessary to cast and construct each type of panel, all reinforcing steel in the panel, and the location of soil reinforcement connection devices embedded in the panels. These panel embed devices shall not be in contact with the panel reinforcement steel.

(e) All details of the wall panels and soil reinforcement placement around all appurtenances located behind, on top of, or passing through the soil reinforced wall volume such as parapets with anchorage slabs, coping, foundations, and utilities etc. shall be clearly indicated. Any modifications to the design of these appurtenances to accommodate a particular system shall also be submitted.

(f) When specified on the contract plans, all details of architectural panel treatment, including color, texture and form liners shall be shown.

(g) The details for the connection between concrete panels, embed devices, and soil reinforcement shall be shown.

(h) When pile sleeves are specified, the pile sleeve material, shape, and wall thickness shall be submitted to the Engineer for approval. It shall have adequate strength to withstand the select fill pressures without collapse until after completion of the wall settlement. The annulus between the pile and the sleeve shall be as small as possible while still allowing it to be filled with loose dry sand after wall erection.

The initial submittal shall include three sets of shop drawings and one set of calculations. One set of drawings will be returned to the Contractor with any corrections indicated. After approval, the Contractor shall furnish the Engineer with ten (10) sets of corrected plan prints for distribution by the Department. No work or ordering of materials for the structure shall be done until the submittal has been approved by the Engineer.

Materials. The MSE walls shall conform to the supplier's standards as previously approved by the Department, and the following:

(a) The soil reinforcing system, which includes the soil reinforcement, and all connection devices, shall be according to the following:

(1) Inextensible Soil Reinforcement. Steel reinforcement shall be according ASTM A 572 Grade 65 (450), ASTM A1064, ASTM A 1011 or ASTM A 463 Grade 50 (345). The steel reinforcement shall be either epoxy coated, aluminized Type 2, or galvanized. Epoxy coatings shall be according to Article 1006.10(a)(2), except the minimum thickness of epoxy coating shall be 18 mils (457 microns). No bend test will be required. Aluminized Type 2-100 shall be according to ASTM A 463. Galvanizing shall be according to AASHTO M 111 or ASTM A 653 with touch up of damage according to ASTM A 780.

(2) Extensible Soil Reinforcement. Geosynthetic reinforcement shall be monolithically fabricated from virgin high density polyethylene (HDPE) or high tenacity polyester (HTPET) resins having the following properties verified by mill certifications:

Property for Geosynthetic Reinforcement	Value	Test
Minimum Tensile Strength	**	ASTM D 6637

** as specified in the approved design calculations and shown on the shop drawings.

Property for HDPE	Value	Test
Melt Flow Rate (g/cm)	0.060 – 0.150	ASTM D 1238, Procedure B
Density (g/cu m)	0.941 – 0.965	ASTM D 792
Carbon Black	2% (min)	ASTM D 4218

Property for HTPET	Value	Test
Carboxyl End Group (max) (mmol/kg)	<30	GRI-GG7
Molecular Weight (Mn)	>25,000	GRI-GG8

(3) Panel Embed/Connection Devices. Panel embeds and connection devices shall be according to the following.

a. Metallic panel embed/connection devices and connection hardware shall be galvanized according to AASHTO M 232 and shall be according to the following.

Mesh and Loop Embeds	ASTM A1064 or ASTM A 706 Grade 60 (420)
Tie Strip Embeds	AASHTO M 270/M 270M Grade 50 (345) or ASTM A 1011 HSLAS Grade 50 (345) Class 2

b. Non metallic panel embed/connection devices typically used with geosynthetic soil reinforcement shall be manufactured from virgin or recycled polyvinyl chloride having the following properties:

Property for Polyvinyl Chloride	Value	Test
Heat Deflection Temperature (°F)	155 - 164	ASTM D 1896
Notched IZOD 1/8 inch @ 73°F (ft-lb/in)	4 – 12	ASTM D 256
Coefficient of Linear Exp. (in/in/°F)	3.5 – 4.5	ASTM D 696
Hardness, Shore D	79	ASTM D 2240

Property for Polypropylene	Value	Test
Melt Flow Rate (g/cm)	0.060 – 0.150	ASTM D 1238, Procedure B
Density (g/cu m)	0.88 – 0.92	ASTM D 792

(b) The select fill, defined as the material placed in the reinforced volume behind the wall, shall be according to Sections 1003 and 1004 of the Standard Specifications and the following:

(1) Select Fill Gradation. Either a coarse aggregate or a fine aggregate may be used. For coarse aggregate, gradations CA 6 thru CA 16 may be used. If an epoxy coated reinforcing is used, the coarse aggregate gradations shall be limited to CA 12 thru CA 16. For fine aggregate, gradations FA 1, FA 2, or FA 20 may be used.

(2) Select Fill Quality. The coarse or fine aggregate shall have a maximum sodium sulfate (Na_2SO_4) loss of 15 percent according to Illinois Modified AASHTO T 104.

(3) Select Fill Internal Friction Angle. The effective internal friction angle for the coarse or fine aggregate shall be a minimum 34 degrees according to AASHTO T 236 on samples compacted to 95 percent density according to Illinois Modified AASHTO T 99. The AASHTO T 296 test with pore pressure measurement may be used in lieu of AASHTO T 236. If the vendor's design uses a friction angle higher than 34 degrees, as indicated on the approved shop drawings, this higher value shall be taken as the minimum required.

(4) Select Fill and Steel Reinforcing. When steel reinforcing is used, the select fill shall meet the following requirements.

a. The pH shall be 5.0 to 10.0 according to Illinois Modified AASHTO T 289.
b. The resistivity according to Illinois Modified AASHTO T 288 shall be greater than 3000 ohm centimeters for epoxy coated and galvanized reinforcement, and 1500 ohm centimeters for Aluminized Type 2. However, the resistivity requirement is not applicable to CA 7, CA 8, CA 11, CA 13, CA 14, CA 15, and CA 16.
c. The chlorides shall be less than 100 parts per million according to Illinois Modified AASHTO T 291 or ASTM D 4327. For either test, the sample shall be prepared according to Illinois Modified AASHTO T 291.
d. The sulfates shall be less than 200 parts per million according to Illinois Modified AASHTO T 290 or ASTM D 4327. For either test, the sample shall be prepared according to Illinois Modified AASHTO T 290.
e. The organic content shall be a maximum 1.0 percent according to Illinois Modified AASHTO T 267.

(5) Select Fill and Geosynthetic Reinforcing. When geosynthetic reinforcing is used, the select fill pH shall be 4.5 to 9.0 according to Illinois Modified AASHTO T 289.

(6) Test Frequency. Prior to start of construction, the Contractor shall provide internal friction angle and pH test results, to show the select fill material meets the specification requirements. In addition, resistivity, chlorides, sulfates, and organic content test results will be required if steel reinforcing is used. The laboratory performing the Illinois Modified AASHTO T 288 test shall be approved by the Department according to the current Bureau of Materials and Physical Research Policy Memorandum “Minimum Laboratory Requirements for Resistivity Testing”. All test results shall not be older than 12 months. In addition, a sample of select fill material will be obtained for testing and approval by the Department. Thereafter, the minimum frequency of sampling and testing by the department at the jobsite will be one per 40,000 tons (36,300 metric tons) of select fill material. Testing to verify the internal friction angle will be required when the wall design utilizes a minimum effective internal friction angle greater than 34 degrees, or when crushed coarse aggregate is not used.

(c) The embankment material behind the select fill shall be according to Section 202 and/or Section 204. An embankment unit weight of 120 lbs/cubic foot (1921 kg/cubic meter) and an effective friction angle of 30 degrees shall be used in the wall system design, unless otherwise indicated on the plans.

(d) The geosynthetic filter material used across the panel joints shall be either a non-woven needle punch polyester or polypropylene or a woven monofilament polypropylene with a minimum width of 12 in. (300 mm) and a minimum non-sewn lap of 6 in. (150 mm) where necessary.

(e) The bearing pads shall be rubber, neoprene, polyvinyl chloride, or polyethylene of the type and grade as recommended by the wall supplier.

(f) All precast panels shall be manufactured with Class PC concrete according to Section 504, Article 1042.02, Article 1042.03, and the following requirements:

(1) The minimum panel thickness shall be 5 1/2 in. (140 mm).

(2) The minimum reinforcement bar cover shall be 1 1/2 in. (38 mm).

(3) The panels shall have a ship lap or tongue and groove system of overlapping joints between panels designed to conceal joints and bearing pads.

(4) The panel reinforcement shall be according to Article 1006.10(a)(2) or 1006.10(b)(1) except the welded wire fabric shall be epoxy coated according to ASTM A884.

(5) All dimensions shall be within 3/16 in. (5 mm).

(6) Angular distortion with regard to the height of the panel shall not exceed 0.2 inches in 5 ft (5 mm in 1.5 m).

(7) Surface defects on formed surfaces measured on a length of 5 ft. (1.5 m) shall not be more than 0.1 in. (2.5 mm).

(8) The panel embed/connection devices shall be cast into the facing panels with a tolerance not to exceed 1 in. (25 mm) from the locations specified on the approved shop drawings.

Unless specified otherwise, concrete surfaces exposed to view in the completed wall shall be finished according to Article 503.15(a). The back face of the panel shall be roughly screeded to eliminate open pockets of aggregate and surface distortions in excess of 1/4 in. (6 mm).

Design Criteria. The design shall be according to the AASHTO LRFD Design Specifications noted on the plans for Mechanically Stabilized Earth Walls except as modified herein. The wall supplier shall be responsible for all internal stability aspects of the wall design and shall supply the Department with computations for each designed wall section. The analyses of settlement, bearing capacity and overall slope stability will be the responsibility of the Department. The wall need not be designed for seismic unless noted on the plans.

External loads, such as those applied through structure foundations, from traffic or railroads, slope surcharge etc., shall be accounted for in the internal stability design. The presence of all appurtenances behind, in front of, mounted upon, or passing through the wall volume such as drainage structures, utilities, structure foundation elements or other items shall be accounted for in the internal stability design of the wall.

The design of the soil reinforcing system shall be according to the applicable design specifications for “Inextensible” steel or “Extensible” geosynthetic reinforcement criteria. The reduced section of the soil reinforcing system shall be sized to allowable stress levels at the end of a 75 year design life.

Steel soil reinforcing systems shall be protected by one of the following; epoxy coating, galvanizing or aluminizing. The design life for epoxy and aluminizing shall be assumed to be 16 years. The corrosion protection for the balance of the 75 year total design life shall be provided using a sacrificial steel thickness computed for all exposed surfaces.

Geosynthetic soil reinforcing systems shall be designed to account for the strength reduction due to long-term creep, chemical and biological degradation, as well as installation damage.

To prevent out of plane panel rotations, the soil reinforcement shall be connected to the standard panels in at least two different elevations, vertically spaced no more than 30 in. (760 mm) apart.

Typical design procedures and details, once accepted by the Department, shall be followed. All wall system changes shall be submitted in advance to the Department for approval.

For aesthetic considerations and differential settlement concerns, the panels shall be erected in such a pattern that the horizontal panel joint line is discontinuous at every other panel. This shall be accomplished by alternating standard height and half height panel placement along the leveling pad. Panels above the lowest level shall be standard size except as required to satisfy the top of exposed panel line shown on the contract plans.

At locations where the plans specify a change of panel alignment creating an included angle of 150 degrees or less, precast corner joint elements will be required. This element shall separate the adjacent panels by creating a vertical joint secured by means of separate soil reinforcement.

Isolation or slip joints, which are similar to corner joints in design and function, may be required to assist in differential settlements at locations indicated on the plans or as recommended by the wall supplier. Wall panels with areas greater than 30 sq. ft. (2.8 sq. m) may require additional slip joints to account for differential settlements. The maximum standard panel area shall not exceed 60 sq. ft. (5.6 sq. m).

Construction. The Contractor shall obtain technical assistance from the supplier during wall erection to demonstrate proper construction procedures and shall include any costs related to this technical assistance in the unit price bid for this item.

The foundation soils supporting the structure shall be graded for a width equal to or exceeding the length of the soil reinforcement. Prior to wall construction, the foundation shall be compacted with a smooth wheel vibratory roller. Any foundation soils found to be unsuitable shall be removed and replaced, as directed by the Engineer, and shall be paid for separately according to Section 202.

When structure excavation is necessary, it shall be made and paid for according to Section 502 except that the horizontal limits for structure excavation shall be from the rear limits of the soil reinforcement to a vertical plane 2 ft. (600 mm) from the finished face of the wall. The depth shall be from the top of the original ground surface to the top of the leveling pad. The additional excavation necessary to place the concrete leveling pad will not be measured for payment but shall be included in this work.

The concrete leveling pads shall have a minimum thickness of 6 in. (150 mm) and shall be placed according to Section 503.

As select fill material is placed behind a panel, the panel shall be maintained in its proper inclined position according to the supplier specifications and as approved by the Engineer. Vertical tolerances and horizontal alignment tolerances shall not exceed 3/4 in. (19 mm) when measured along a 10 ft. (3 m) straight edge. The maximum allowable offset in any panel joint shall be 3/4 in. (19 mm). The overall vertical tolerance of the wall, (plumbness from top to bottom) shall not exceed 1/2 in. per 10 ft. (13 mm per 3 m) of wall height. The precast face panels shall be erected to insure that they are located within 1 in. (25 mm) from the contract plan offset at any location to insure proper wall location at the top of the wall. Failure to meet this tolerance may cause the Engineer to require the Contractor to disassemble and re-erect the affected portions of the wall. A 3/4 in. (19 mm) joint separation shall be provided between all adjacent face panels to prevent direct concrete to concrete contact. This gap shall be maintained by the use of bearing pads and/or alignment pins.

The back of all panel joints shall be covered by a geotextile filter material attached to the panels with a suitable adhesive. No adhesive will be allowed directly over the joints.

The select fill and embankment placement shall closely follow the erection of each lift of panels. At each soil reinforcement level, the fill material should be roughly leveled and compacted before placing and attaching the soil reinforcing system. The soil reinforcement and the maximum lift thickness shall be placed according to the supplier's recommended procedures except, the lifts for select fill shall not exceed 10 in. (255 mm) loose measurement or as approved by the Engineer. Embankment shall be constructed according to Section 205.

At the end of each day’s operations, the Contractor shall shape the last level of select fill to permit runoff of rainwater away from the wall face. Select fill shall be compacted according to the project specifications for embankment except the minimum required compaction shall be 95 percent of maximum density as determined by Illinois Modified AASHTO T 99. Select fill compaction shall be accomplished without disturbance or distortion of soil reinforcing system and panels. Compaction in a strip 3 ft. (1 m) wide adjacent to the backside of the panels shall be achieved using a minimum of 3 passes of a light weight mechanical tamper, roller or vibratory system. The Engineer will perform one density test per 5000 cu yd (3800 cu m) and not less than one test per 2 ft (0.6 m) of lift.

Method of Measurement. Mechanically Stabilized Earth Retaining Wall will be measured for payment in square feet (square meters). The MSE retaining wall will be measured from the top of exposed panel line to the theoretical top of leveling pad line for the length of the wall as shown on the contract plans.

Basis of Payment. This work, including placement of the select fill within the soil reinforced wall volume shown on the approved shop drawings, precast face panels, soil reinforcing system, concrete leveling pad and accessories will be paid for at the contract unit price per square foot (square meter) for MECHANICALLY STABILIZED EARTH RETAINING WALL.

Concrete coping when specified on the contract plans will be included for payment in this work. Other concrete appurtenances such as anchorage slabs, parapets, abutment caps, etc. will not be included in this work, but will be paid for as specified elsewhere in this contract, unless otherwise noted on the plans.

Excavation necessary to place the select fill for the MSE wall shall be paid for as STRUCTURE EXCAVATION and/or ROCK EXCAVATION FOR STRUCTURES as applicable, according to Section 502.

Fill placed within the foot print of the reinforced soil mass, above the top layer of soil reinforcement and below the bottom of the subgrade or top soil, shall be included in the cost of the MSE wall.

Embankment placed outside of the select fill volume will be measured and paid for according to Sections 202 and/or 204 as applicable.

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.

DIAMOND GRINDING AND SURFACE TESTING BRIDGE SECTIONS
Effective: December 6, 2004
Revised: January 3, 2014

Description. This work shall consist of diamond grinding and surface testing bridge sections.

A bridge section shall consist of the bridge deck plus the bridge approach pavement and connector pavement on each side of the bridge.

Equipment. Equipment shall be according to the following.

(a) Diamond Grinder. The diamond grinder shall be a self-propelled planing machine specifically designed for diamond saw grinding. It shall be capable of accurately and automatically establishing the profile grade and shall have a positive means for controlling cross slope. It shall also have an effective means for removing excess material and slurry from the surface and for preventing dust from escaping into the air. The diamond grinder shall not cause strain or damage to the surface.

The grinding head shall be a minimum of 4 ft. (1.2 m) wide and the diamond saw blades shall be gang mounted on the grinding head at a rate of 50 blades / ft. (164 blades/m).

(b) Surface Testing Equipment. Required surface testing and analysis equipment and their jobsite transportation shall be provided by the Contractor.

(1) Profile Testing Device. The Profile Testing Device shall have a decal displayed to indicate it has been tested through the PEV Program administered by the Department.

a. California Profilograph. The California Profilograph shall be either computerized or manual and have a frame 25 ft (8 m) in length supported upon multiple wheels at either end. The profile shall be recorded from the vertical movement of a wheel attached to the frame at mid point.

The California Profilograph shall be calibrated according to the manufacturer's recommendations and California Test 526. All calibration traces and calculations shall be submitted to the Engineer for the project file.

b. Inertial Profiler. The inertial profiler shall be either an independent device or a system that can be attached to another vehicle using one or two non-contact sensors to measure the pavement profile. The inertial profiler shall be capable of performing a simulation of the California Profilograph to provide results in the Profile Index format.

The inertial profiler shall be calibrated according to the manufacturer's recommendations. All calibration traces and calculations shall be submitted to the Engineer for the project file.

(3) Trace Analysis. The Contractor shall reduce/evaluate these traces using a 0.00 in. (0.0 mm) blanking band and determine a Profile Index in in./mile (mm/km) for each bridge section. Traces produced using a computerized profile testing device will be evaluated without further reduction. When using a manual profile testing device, the Contractor shall provide an electronic scanner, a computer, and software to reduce the trace. All analysis equipment (electronic scanner, computerized recorder, etc.) shall be able to accept 0.00 in. (0.0 mm) for the blanking band.

All traces from bridge sections tested with the profile testing device shall be recorded on paper with scales of 300:1 longitudinally and 1:1 vertically. Equipment and software settings of the profile testing device and analysis equipment shall be set to those values approved through the PEV Program."

CONSTRUCTION REQUIREMENTS

General. After all components have been properly cured, the bridge section shall be ground over its entire length and over a width that extends to within 2 ft. (600 mm) of the curbs or parapets. The maximum thickness removed shall be 1/4 in. (6 mm); however, when the bridge deck thickness noted on the plans can be maintained, as a minimum, additional removal thickness may be permitted.

The vertical difference between longitudinal passes shall be 1/8 in. (3 mm) maximum. The grinding at the ends of the bridge section shall be diminished uniformly at a rate of 1:240 over the connector pavements.

Grinding shall be continuous through all joints. When sealed joints are specified, grinding shall be completed prior to final installation of the joints seals. During grinding, joint openings shall be temporarily filled with material approved by the Engineer.

Surface Testing. The diamond ground bridge section shall be surface tested in the presence of the Engineer prior to opening to traffic. All objects and debris shall be removed from the surface prior to testing. During surface testing, joint openings may be temporarily filled with material approved by the Engineer.

Profiles shall be taken in the wheel paths of each lane, 3 ft. (1 m) from and parallel to the planned lane lines. A guide shall be used to maintain the required distance.

The profile trace shall be printed on continuous paper with scales of 300:1 horizontally and 1:1 vertically and shall have stationing indicated every 500 ft. (150 m) at a minimum. Both ends of the profile trace shall be labeled with the following information: contract number, beginning and ending stationing, which direction is up on the trace, which direction the profilograph was pushed, and profilograph operator name(s). The top portion of the Profilograph Report of Bridge Smoothness (Attachment 1) shall be completed and the form secured around the trace roll.

Trace Reduction and Bump Locating Procedure. All traces shall be reduced. Traces produced by a mechanical recorder shall be reduced using an electronic scanner and computer software. This software shall calculate the profile index and indicate any bumps in excess of 0.30 in. (8 mm) with a line intersecting the profile on the printout. Computerized recorders shall provide the same information.

The average profile index and locations with deviations exceeding the 0.30 in. (8 mm) limit shall be recorded on the Profilograph Report of Bridge Smoothness as shown in Attachment 1.

All traces and completed reports shall be provided within two working days of completing the testing to the Engineer for the project file. Traces from either a computerized profile testing device or analysis software used with a manual profile testing device shall display the settings used for the data reduction. The Engineer will compare these settings with the approved settings from the PEV Program. If the settings do not match, the results will be rejected and the section shall be retested/reanalyzed with the appropriate settings.

Corrective Actions. Within the bridge section, all deviations in excess of 0.30 in. (8 mm) in a length of 25 ft. (8 m) or less shall be corrected regardless of the profile index value. Correction of deviations shall not result in the deck thickness being less than the minimum.

Any bridge section having an average profile index greater than 35.0 in/mile (555 mm), including bumps, shall be corrected to reduce the profile index to 35.0 in./mile (555 mm/km) or less on each trace.

Where corrective work is performed, the bridge section shall be retested to verify that corrections have produced a profile index of 35.0 in./mile (555 mm/km) or less for each trace.

Corrective actions shall be performed at no additional cost to the department. The Contractor shall furnish the surface profilograph tracing and the completed form to the Engineer within two working days after any corrections are made.

The Engineer may perform profilograph testing on the surface at any time for monitoring and comparison purposes.

Smoothness Assessments. Smoothness assessments will be based on the final average profile index determined for the bridge section after performing any corrective work. Additional payments/deductions will be as indicated in the Smoothness Assessment Schedule.

The Smoothness Assessment Work Sheet (Attachment 2) will be completed by the Engineer for payment.

SMOOTHNESS ASSESSMENT SCHEDULE

Profile Index in./mile (mm/km) per Bridge Section	Smoothness Assessment per Bridge Section
15.0 (240) or less	+$7,500.00
>15.0 (240) to 18.0 (285)	+$5,000.00
>18.0 (285) to 20.0 (315)	+$2,500.00
>20.0 (315) to 35.0 (555)	+$0.00
>35.0 (555) to 45.0 (710)	+$0.00
>45.0 (710)	-$5,000.00

Method of Measurement. This work will be measured for payment in place and the area computed in square yards (square meters) of diamond grinding performed.

Basis of Payment. This work will be paid for at the contract unit price per square yard (square meter) for DIAMOND GRINDING (BRIDGE SECTION).

INSTRUCTIONS FOR COMPLETING

PROFILOGRAPH REPORT OF BRIDGE SMOOTHNESS

This form shall be prepared and submitted, along with the profile trace, to the Engineer.

The Type of Report is one of the following:

Information – Test conducted for informational purposes only.

Initial – Testing of bridge section prior to any corrective action.

Intermediate – After some corrective action has been completed.

Final – After all corrective action has been completed.

Other Information:

Structure Number – Numerical identification of the bridge.

Traffic Direction – NB, SB, EB, or WB depending on the design traffic flow of the numbered route.

Lane Designation – DL (Driving Lane), CL (Center Lane), or PL (Passing Lane).

Operator – Printed name of Contractor personnel operating profilograph.

Engineer – Printed name of Department representative witnessing data collection.

Bump locations are listed by station for each track (wheel path).

EXAMPLE

PROFILOGRAPH REPORT FOR BRIDGE SMOOTHNESS

Type of Report:

____ **Information** __√__ **Initial** ____ **Intermediate** ____ **Final**

Contract No. 96739 **Route** IL 255

Contractor John Doe Construction Co. **Section No.** _____

Station 1795+06.0 **County** Madison

No. of Lanes 2 **Structure Number** 060-1234

Operator Joe Smith **Traffic Direction** EB

Engineer Mike Jones **Date Tested** 09/02/99

Section No.	Length mile (km)	Track 1 Measured Roughness in. (mm)	Track 1 Profile Index in./mile (mm/km)	Track 2 Measured Roughness in. (mm)	Track 2 Profile Index in./mile (mm/km)	Average Profile Index in./mile (mm/km)
1	0.100	2.16	21.6	1.30	13.0	17.3
2	0.100	2.18	21.8	2.26	22.6	22.2

Bump Locations: Track 1: 1893+53.5

Certified by: _____

Title: Chief Profilograph Pusher

Organization: John Doe Construction Co.

ATTACHMENT 1

PROFILOGRAPH REPORT FOR BRIDGE SMOOTHNESS

Type of Report:

____ Information **____ Initial** **____ Intermediate** **____ Final**

Contract No. _____ **Route** _____

Contractor _____ **Section No.** _____

Station _____ **County** _____

No. of Lanes _____ **Structure Number** _____

Operator _____ **Traffic Direction** _____

Engineer _____ **Date Tested** _____

Section No.	Length mile (km)	Track 1 Measured Roughness in. (mm)	Track 1 Profile Index in./mile (mm/km)	Track 2 Measured Roughness in. (mm)	Track 2 Profile Index in./mile (mm/km)	Average Profile Index in./mile (mm/km)

Bump Locations: _____

Certified by: _____

Title: _____

Organization: _____

ATTACHMENT 2

SMOOTHNESS ASSESSMENT WORK SHEET

Contract No. _____ Section _____

Route _____ County _____

Section Number	Structure Number	Final Profile Index	Smoothness Assessment (+ or -)	Accumulated Assessment (+ or -)	Remarks/Final Profile
			Final Assessment		

Computed by:_____ Checked by:_____

Approved by: _____

COFFERDAMS
Effective: October 15, 2011

Replace Article 502.06 with the following.

502.06 Cofferdams. A Cofferdam shall be defined as a temporary structure, consisting of engineered components, designed to isolate the work area from water to enable construction under dry conditions based on either the Estimated Water Surface Elevation (EWSE) or Cofferdam Design Water Elevation (CDWE) shown on the contract plans as specified below. When cofferdams are not specified in the contract documents and conditions are encountered where the excavation for the structure cannot be kept free of water for prosecuting the work by pumping and/or diverting water, the Contractor, with the written permission of the Engineer, will be permitted to construct a cofferdam.

The Contractor shall submit a cofferdam plan for each cofferdam to the Engineer for approval prior to the start of construction. Cofferdams shall not be installed or removed without the Engineer's approval. Work shall not be performed in flowing water except for the installation and removal of the cofferdam. The cofferdam plan shall address the following:

(a) Cofferdam (Type 1). The Contractor shall submit a cofferdam plan which addresses the proposed methods of construction and removal; the construction sequence including staging; dewatering methods; erosion and sediment control measures; disposal of excavated material; effluent water control measures; backfilling; and the best management practices to prevent reintroduction of excavated material into the aquatic environment. The design and method of construction shall provide, within the measurement limits specified in Article 502.12, necessary clearance for forms, inspection of exterior of the forms, pumping, and protection of fresh concrete from water. For Type 1 cofferdams, it is anticipated the design will be based on the EWSE shown on the contract plans. The Contractor shall assume all liability, financial or otherwise for a Type 1 cofferdam designed for an elevation lower than the EWSE.

(b) Cofferdam (Type 2). In addition to the requirements of Article 502.06(a), the Contractor’s submittal shall include detailed drawings and design calculations, prepared and sealed by an Illinois Licensed Structural Engineer. For Type 2 cofferdams it is anticipated the design will be based on the CDWE shown on the contract plans. The Contractor shall assume all liability, financial or otherwise for a Type 2 cofferdam designed for an elevation lower than the CDWE.

(c) Seal Coat. The seal coat concrete, when shown on the plans, is based on design assumptions in order to establish an estimated quantity. When seal coat is indeed utilized, it shall be considered an integral part of the overall cofferdam system and, therefore, its design shall be included in the overall cofferdam design submittal. If a seal coat was not specified but determined to be necessary, it shall be added to the contract by written permission of the Engineer. The seal coat concrete shall be constructed according to Article 503.14. After the excavation within the cofferdam has been completed and the piles have been driven (if applicable), and prior to placing the seal coat, the elevation of the bottom of the proposed seal coat shall be verified by soundings. The equipment and methods used to conduct the soundings shall meet the approval of the Engineer. Any material within the cofferdam above the approved bottom of the seal coat elevation shall be removed.

No component of the cofferdam shall extend into the substructure concrete or remain in place without written permission of the Engineer. Removal shall be according to the previously approved procedure. Unless otherwise approved in writing by the Engineer, all components of the cofferdam shall be removed.

Revise the first paragraph of 502.12(b) to read as follows.

(b) Measured Quantities. Structure excavation, when specified, will be measured for payment in its original position and the volume computed in cubic yards (cubic meters). Horizontal dimensions will not extend beyond vertical planes 2 ft (600 mm) outside of the edges of footings of bridges, walls, and corrugated steel plate arches. The vertical dimension for structure excavation will be the average depth from the surface of the material to be excavated to the bottom of the footing as shown on the plans or ordered in writing by the Engineer. The volume of any unstable and/or unsuitable material removed within the structure excavation will be measured for payment in cubic yards (cubic meters).

Revise the last paragraph of 502.12(b) to read as follows.

Cofferdam excavation will be measured for payment in cubic yards (cubic meters) in its original position within the cofferdam. Unless otherwise shown on the plans, the horizontal dimensions used in computing the volume will not extend beyond vertical planes 2 ft (600 mm) outside of the edges of the substructure footings or 4 ft (1.2 m) outside of the faces of the substructure stem wall, whichever is greater. The vertical dimensions will be the average depth from the surface of the material to be excavated to the elevation shown on the plans for bottom of the footing, stem wall, or seal coat, or as otherwise determined by the Engineer as the bottom of the excavation.

Revise the first sentence of the sixth paragraph of 502.13 to read as follows.

Cofferdams, when specified, will be paid for at the contract unit price per each for COFFERDAM (TYPE 1) or COFFERDAM (TYPE 2), at the locations specified.

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.

BRIDGE DECK CONSTRUCTION
Effective: October 22, 2013
Revised: April 18, 2014

Revise the Second Paragraph of Article 503.06(b) to read as follows.

"When the Contractor uses cantilever forming brackets on exterior beams or girders, additional requirements shall be as follows."

Revise Article 503.06(b)(1) to read as follows.

"(1) Bracket Placement. The spacing of brackets shall be per the manufacturer's published design specifications for the size of the overhang and the construction loads anticipated. The resulting force of the leg brace of the cantilever bracket shall bear on the web within 6 inches (150 mm) of the bottom flange of the beam or girder."

Revise Article 503.06(b)(2) to read as follows.

"(2) Beam Ties. The top flange of exterior steel beams or girders supporting the cantilever forming brackets shall be tied to the bottom flange of the next interior beam. The top flange of exterior concrete beams supporting the cantilever forming brackets shall be tied to the top flange of the next interior beam. The ties shall be spaced at 4 ft (1.2 m) centers. Permanent cross frames on steel girders may be considered a tie. Ties shall be a minimum of 1/2 inch (13 mm) diameter threaded rod with an adjusting mechanism for drawing the tie taut. The ties shall utilize hanger brackets or clips which hook onto the flange of steel beams. No welding will be permitted to the structural steel or stud shear connectors, or to reinforcement bars of concrete beams, for the installation of the tie bar system. After installation of the ties and blocking, the tie shall be drawn taut until the tie does not vary from a straight line from beam to beam. The tie system shall be approved by the Engineer."

Revise Article 503.06(b)(3) to read as follows.

"(3) Beam Blocks. Suitable beam blocks of 4 in x 4 in (100 x 100 mm) timbers or metal structural shapes of equivalent strength or better, acceptable to the Engineer, shall be wedged between the webs of the two beams tied together, within 6 inches (150 mm) of the bottom flange at each location where they are tied. When it is not feasible to have the resulting force from the leg brace of the cantilever brackets transmitted to the web within 6 inches (150 mm) of the bottom flange, then additional blocking shall be placed at each bracket to transmit the resulting force to within 6 inches (150 mm) of the bottom flange of the next interior beam or girder."

Delete the last paragraph of Article 503.06(b).

Revise the third paragraph of Article 503.16 to read as follows.

"Fogging equipment shall be in operation unless the evaporation rate is less than 0.1 lb/sq ft/hour (0.5kg/sq m/hour) and the Engineer gives permission to stop. The evaporation rate shall be determined according to the following formula.

$$E = (T_c^{2.5} - rT_a^{2.5})(1 + 0.4V)x10^{-6} \, (English)$$

$$E = 5[(T_c + 18)^{2.5} - r(T_a + 18)^{2.5}](V + 4)x10^{-6} \, (Metric)$$

Where:

E = Evaporation Rate, lb/ft^2/h (kg/sq m/h)

T_c = Concrete Temperature, °F (°C)

T_a = Air Temperature, °F (°C)

r = Relative Humidity in percent/100

V = Wind Velocity, mph (km/h)

The Contractor shall provide temperature, relative humidity, and wind speed measuring equipment. Fogging equipment shall be adequate to reach or cover the entire pour from behind the finishing machine or vibrating screed to the point of curing covering application, and shall be operated in a manner which shall not accumulate water on the deck until the curing covering has been placed."

Revise the third paragraph of Article 503.16(a)(1) to read as follows.

"At the Contractor's option, a vibrating screed may be used in lieu of a finishing machine for superstructures with a pour width less than or equal to 24 ft (7.3 m). After the concrete is placed and consolidated, it shall be struck off with a vibrating screed allowing for camber, if required. The vibrating screed shall be of a type approved by the Engineer. A slight excess of concrete shall be kept in front of the cutting edge at all times during the striking off operation. After screeding, the entire surface shall be finished with hand-operated longitudinal floats having blades not less than 10 ft (3 m) in length and 6 in. (150 mm) in width. Decks so finished need not be straightedge tested as specified in 503.16(a)(2)."

Delete the fifth paragraph of 503.16(a)(1).

Revise Article 503.16(a)(2) to read as follows.

"(2) Straightedge Testing and Surface Correction. After the finishing has been completed and while the concrete is still plastic, the surface shall be tested for trueness with a 10 ft (3 m) straightedge, or a hand-operated longitudinal float having blades not less than 10 ft (3 m) in length and 6 in. (150 mm) in width. The Contractor shall furnish and use an accurate 10 ft (3 m) straightedge or float which has a handle not less than 3 ft (1 m) longer than 1/2 the pour width. The straightedge or float shall be held in contact with the surface and passed gradually from one side of the superstructure to the other. Advance along the surface shall be in successive stages of not more than 1/2 the length of the straightedge or float. Any depressions found shall be immediately filled with freshly mixed concrete, struck off, consolidated, and refinished. High areas shall be cut down and refinished."

Replace the second sentence of the first paragraph of Article 1020.13(a)(5) with the following sentences.

"Cotton mats in poor condition will not be allowed. The cotton mats shall be placed in a manner which will not create indentations greater than 1/4 inch (6 mm) in the concrete surface. Minor marring of the surface is tolerable and is secondary to the importance of timely curing."

Revise Article 1020.14(b) to read as follows.

"(b) Concrete in Structures. Concrete may be placed when the air temperature is above 40 °F (4 °C) and rising, and concrete placement shall stop when the falling temperature reaches 45 °F (7 °C) or below, unless otherwise approved by the Engineer.

(1) Bridge Deck Concrete. For concrete in bridge decks, slabs, and bridge approach slabs the Contractor shall schedule placing and finishing of the concrete during hours in which the ambient air temperature is forecast to be lower than 85 °F (30 °C). It shall be understood this may require scheduling the deck pour at night in order to utilize the temperature window available. The temperature of the concrete immediately before placement shall be a minimum of 50 °F (10 °C) and a maximum of 85 °F (30 °C).

(2) Non-Bridge Deck Concrete. Except as noted above, the temperature of the concrete immediately before placement shall be a minimum of 50 °F (10 °C) and a maximum of 90 °F (32 °C).

If concrete is pumped, the temperature restrictions above shall be considered at point of placement. When insulated forms are used according to Article 1020.13(d)(1), the maximum temperature of the concrete mixture immediately before placement shall be 80 °F (25 °C).When concrete is placed in contact with previously placed concrete, the temperature of the freshly mixed concrete may be increased by the Contractor to offset anticipated heat loss, but in no case shall the maximum concrete temperature be permitted to exceed the limits stated in this Article."

Revise Article 1103.13(a) to read as follows.

"(a) Bridge Deck. The finishing machine shall be equipped with: (1) a mechanical strike off device; (2) either a rotating cylinder(s) or a longitudinal oscillating screed which transversely finishes the surface of the concrete. The Contractor may attach other equipment to the finishing machine to enhance the final finish when approved by the Engineer. The finishing machine shall produce a deck surface of uniform texture, free from porous areas, and with the required surface smoothness.

The finishing machine shall be operated on rails or other supports that will not deflect under the applied loads. The maximum length of rail segments supported on top of beams and within the pour shall be 10 ft (3 m). The supports shall be adjustable for elevation and shall be completely in place to allow the finishing machine to be used for the full length of the area to be finished. The supports shall be approved by the Engineer before placing of the concrete is started."

Revise Article 1103.17(k) to read as follows.

"(k) Fogging Equipment. Fogging equipment shall be hand held fogging equipment for humidity control. The equipment shall be capable of atomizing water to produce a fog blanket by the use of pressure 2500 psi minimum (17.24 MPa) and an industrial fire hose fogging nozzle or equivalent. Fogging equipment attached to the finishing machine will not be permitted."

FABRIC REINFORCED ELASTOMERIC
Effective: August 29, 2014

Revise the second paragraph of Article 1028.01 of the Standard Specifications to read:

"The elastomer compound shall be either Polychloroprene according to Table X1 of AASHTO M 251 having a minimum Hardness (Durometer) of 50 or Ethylene Propylene Diene Monomer (EPDM) according to Article 1052.02. The composite of the fabric and elastomer compound shall have a minimum tensile strength of 700 x 700 lb./in. (122.6 x 122.6 N/mm) according to ASTM D 378. The minimum elongation at ultimate tensile strength shall be 30 percent according to ASTM D 412."

AGGREGATE SUBGRADE IMPROVEMENT (BDE)
Effective: April 1, 2012 Revised: January 1, 2013

Add the following Section to the Standard Specifications:

"**SECTION 303. AGGREGATE SUBGRADE IMPROVEMENT**

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

303.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Coarse Aggregate	1004.06
(b) Reclaimed Asphalt Pavement (RAP) (Notes 1, 2, and 3)	1031

Note 1. Crushed RAP, from either full depth or single lift removal, may be mechanically blended with aggregate gradations CS 01, CS 02, and RR 01 but shall not exceed 40 percent of the total product. The top size of the 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, CS 02, or RR 01 are used in lower lifts.

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 CA 02, CA 06, or CA 10 shall be 12 in. (300 mm). The maximum nominal lift thickness of aggregate gradations CS 01, CS 02, and RR 01 shall be 24 in. (600 mm).

303.06 Capping Aggregate. The top surface of the aggregate subgrade shall consist of a minimum 3 in. (75 mm) of aggregate gradations CA 06 or CA 10. When the contract specifies that a granular subbase is to be placed on the aggregate subgrade improvement, the 3 in. (75 mm) of capping aggregate shall be the same gradation and may be placed with the underlying aggregate subgrade improvement material.

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) or ton (metric ton) for AGGREGATE SUBGRADE IMPROVEMENT or at the contract unit price per square yard (square meter) for AGGREGATE SUBGRADE IMPROVEMENT, of the thickness specified."

Add the following to Section 1004 of the Standard Specifications:

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

(a) Description. The coarse aggregate shall be crushed gravel, crushed stone, or crushed concrete.

(b) Quality. The coarse aggregate shall consist of sound durable particles reasonably free of deleterious materials.

(c) Gradation.

(1) The coarse aggregate gradation for total subgrade thickness less than or equal to 12 in. (300 mm) shall be CA 2, CA 6, CA 10, or CS 01.

The coarse aggregate gradation for total subgrade thickness more than 12 in. (300 mm) shall be CS 01, CS 02 or RR 01(see Article 1005.01(c)).

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

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

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

AUTOMATED FLAGGER ASSISTANCE DEVICES (BDE)
Effective: January 1, 2008

Description. This work shall consist of furnishing and operating automated flagger assistance devices (AFADs) as part of the work zone traffic control and protection for two-lane highways where two-way traffic is maintained over one lane of pavement. Use of these devices shall be at the option of the Contractor.

Equipment. AFADs shall be according to the FHWA memorandum, “MUTCD - Revised Interim Approval for the use of Automated Flagger Assistance Devices in Temporary Traffic Control Zones (IA-4R)”, dated January 28, 2005. The devices shall be mounted on a trailer or a moveable cart and shall meet the requirements of NCHRP 350, Category 4.

The AFAD shall be the Stop/Slow type. This device uses remotely controlled “STOP” and “SLOW” signs to alternately control right-of-way.

Signs for the AFAD shall be according to Article 701.03 of the Standard Specifications and the MUTCD. The signs shall be 24 x 24 in. (600 x 600 mm) having an octagon shaped “STOP” sign on one side and a diamond shaped “SLOW” sign on the opposite side. The letters on the signs shall be 8 in. (200 mm) high. If the “STOP” sign has louvers, the full sign face shall be visible at a distance of 50 ft (15 m) and greater.

The signs shall be supplemented with one of the following types of lights.

(a) Flashing Lights. When flashing lights are used, white or red flashing lights shall be mounted within the "STOP" sign face and white or yellow flashing lights within the "SLOW" sign face.

(b) Stop and Warning Beacons. When beacons are used, a stop beacon shall be mounted 24 in. (600 mm) or less above the "STOP" sign face and a warning beacon mounted 24 in. (600 mm) or less above, below, or to the side of the "SLOW" sign face. As an option, a Type B warning light may be used in lieu of the warning beacon.

A "WAIT ON STOP" sign shall be placed on the right hand side of the roadway at a point where drivers are expected to stop. The sign shall be 24 x 30 in. (600 x 750 mm) with a black legend and border on a white background. The letters shall be at least 6 in. (150 mm) high.

This device may include a gate arm or mast arm that descends to a horizontal position when the "STOP" sign is displayed and rises to a vertical position when the "SLOW" sign is displayed. When included, the end of the arm shall reach at least to the center of the lane being controlled. The arm shall have alternating red and white retroreflective stripes, on both sides, sloping downward at 45 degrees toward the side on which traffic will pass. The stripes shall be 6 in. (150 mm) in width and at least 2 in. (50 mm) in height.

Flagging Requirements. Flaggers and flagging requirements shall be according to Article 701.13 of the Standard Specifications and the following.

AFADs shall be placed at each end of the traffic control, where a flagger is shown on the plans. The flaggers shall be able to view the face of the AFAD and approaching traffic during operation.

To stop traffic, the "STOP" sign shall be displayed, the corresponding lights/beacon shall flash, and when included, the gate arm shall descend to a horizontal position. To permit traffic to move, the "SLOW" sign shall be displayed, the corresponding lights/beacon shall flash, and when included, the gate arm shall rise to a vertical position.

If used at night, the AFAD location shall be illuminated according to Section 701 of the Standard Specifications.

When not in use, AFADs will be considered nonoperating equipment and shall be stored according to Article 701.11 of the Standard Specifications.

Basis of Payment. This work will not be paid for separately but shall be considered as included in the cost of the various traffic control items included in the contract.

COARSE AGGREGATE IN BRIDGE APPROACH SLABS/FOOTINGS (BDE)
Effective: April 1, 2012 Revised: April 1, 2013

Revise the third paragraph of Article 1004.01(b) of the Standard Specifications to read:

"Aggregates used in Class BS concrete (except when poured on subgrade), Class PS concrete, and Class PC concrete (bridge superstructure products only, excluding the approach slab) shall contain no more than two percent by weight (mass) of deleterious materials. Deleterious materials shall include substances whose disintegration is accompanied by an increase in volume which may cause spalling of the concrete."

Revise the first sentence of the first paragraph of Article 1004.02(f) of the Standard Specifications to read:

"(f) Freeze-Thaw Rating. When coarse aggregate is used to produce portland cement concrete for base course, base course widening, pavement (including precast), driveway pavement, sidewalk, shoulders, curb, gutter, combination curb and gutter, median, paved ditch, concrete superstructures on subgrade such as bridge approach slabs (excluding precast), concrete structures on subgrade such as bridge approach footings, or their repair using concrete, the gradation permitted will be determined from the results of the Department's Freeze-Thaw Test (Illinois Modified AASHTO T 161)."

COATED GALVANIZED STEEL CONDUIT (BDE)
Effective: January 1, 2013 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 µm). The interior coating shall be applied in a manner so there are no runs, drips, or pinholes at any point. The coating shall not peel, flake, or chip off after a cut is made in the conduit or a scratch is made in the coating. The urethane interior coating applied shall afford sufficient flexibility to permit field bending without cracking or flaking of the interior coating.

All conduit fittings and couplings shall be as specified and recommended by the conduit manufacturer. All conduit fitting covers shall be furnished with stainless steel screws which have been encapsulated with a polyester material on the head to ensure maximum corrosion protection."

COILABLE NONMETALLIC CONDUIT (BDE)
Effective: August 1, 2014

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

"(c) Coilable Nonmetallic Conduit. The conduit shall be a high density polyethylene duct which is intended for underground use can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties or performance. The conduit and its manufacture shall be according to UL Standard 651A.

Performance Tests. Testing procedures and test results shall meet the requirements of UL Standard 651A. Certified copies of the test report shall be submitted to the Engineer prior to the installation of the conduit."

CONCRETE END SECTIONS FOR PIPE CULVERTS (BDE)
Effective: January 1, 2013

Description. This work shall consist of constructing cast-in-place concrete and precast concrete end sections for pipe culverts. These end sections are shown on the plans as Highway Standard 542001, 542006, 542011, or 542016. This work shall be according to Section 542 of the Standard Specifications except as modified herein.

Materials. Materials shall be according to the following Articles of Division 1000 – Materials of the Standard Specifications.

Item	Article/Section
(a) Portland Cement Concrete (Note 1)	1020
(b) Precast Concrete End Sections (Note 2)	
(c) Coarse Aggregate (Note 3)	1004.05
(d) Structural Steel (Note 4)	1006.04
(e) Anchor Bolts and Rods (Note 5)	1006.09
(f) Reinforcement Bars	1006.10(a)
(g) Nonshrink Grout	1024.02
(h) Chemical Adhesive Resin System	1027
(i) Mastic Joint Sealer for Pipe	1055
(j) Hand Hole Plugs	1042.16

Note 1. Cast-in-place concrete end sections shall be Class SI, except the 14 day mix design shall have a compressive strength of 5000 psi (34,500 kPa) or a flexural strength of (800 psi) 5500 kPa and a minimum cement factor of 6.65 cwt/cu yd (395 kg/cu m).

Note 2. Precast concrete end sections shall be according to Articles 1042.02 and 1042.03(b)(c)(d)(e) of the Standard Specifications. The concrete shall be Class PC according to Section 1020, and shall have a minimum compressive strength of 5000 psi (34,000 kPa) at 28 days.

Joints between precast sections shall be produced with reinforced tongue and groove ends according to the requirements of ASTM C 1577.

Note 3. The granular bedding placed below a precast concrete end section shall be gradation CA 6, CA 9, CA 10, CA 12, CA 17, CA 18, or CA 19.

Note 4. All components of the culvert tie detail shall be galvanized according to the requirements of AASHTO M 111 or M 232 as applicable.

Note 5. The anchor rods for the culvert ties shall be according to the requirements of ASTM F 1554, Grade 105 (Grade 725).

CONSTRUCTION REQUIREMENTS

The concrete end sections may be precast or cast-in-place construction. Toe walls shall be either precast or cast-in-place, and shall be in proper position and backfilled according to the applicable paragraphs of Article 502.10 of the Standard Specifications prior to the installation of the concrete end sections. If soil conditions permit, cast-in-place toe walls may be poured directly against the soil. When poured directly against the soil, the clear cover of the sides and bottom of the toe wall shall be increased to 3 in. (75 mm) by increasing the thickness of the toe wall.

(a) Cast-In-Place Concrete End Sections. Cast-in-place concrete end sections shall be constructed according to the requirements of Section 503 of the Standard Specifications and as shown on the plans.

(b) Precast Concrete End Sections. When the concrete end sections will be precast, shop drawings detailing the slab thickness and reinforcement layout shall be submitted to the Engineer for review and approval.

The excavation and backfilling for precast concrete end sections shall be according to the requirements of Section 502 of the Standard Specifications, except a layer of granular bedding at least 6 in. (150 mm) in thickness shall be placed below the elevation of the bottom of the end section. The granular bedding shall extend a minimum of 2 ft (600 mm) beyond each side of the end section.

Anchor rods connecting precast sections shall be brought to a snug tight condition followed by an additional 2/3 turn on one of the nuts. Match marks shall be provided on the bolt and nut to verify relative rotation between the bolt and the nut.

Method of Measurement. This work will be measured for payment as each, with each end of each culvert being one each.

Basis of Payment. This work will be paid for at the contract unit price per each for CONCRETE END SECTION, STANDARD 542001; CONCRETE END SECTION, STANDARD 542006; CONCRETE END SECTION, 542011; or CONCRETE END SECTION, 542016, of the pipe diameter and slope specified.

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_1 or T_2), according to ASTM C 920."

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 (BDE)
Effective: September 1, 2000 Revised: August 2, 2011

FEDERAL OBLIGATION. The Department of Transportation, as a recipient of federal financial assistance, is required to take all necessary and reasonable steps to ensure nondiscrimination in the award and administration of contracts. Consequently, the federal regulatory provisions of 49 CFR Part 26 apply to this contract concerning the utilization of disadvantaged business enterprises. For the purposes of this Special Provision, a disadvantaged business enterprise (DBE) means a business certified by the Department in accordance with the requirements of 49 CFR Part 26 and listed in the Illinois Unified Certification Program (IL UCP) DBE Directory.

STATE OBLIGATION. This Special Provision will also be used by the Department to satisfy the requirements of the Business Enterprise for Minorities, Females, and Persons with Disabilities Act, 30 ILCS 575. When this Special Provision is used to satisfy state law requirements on 100 percent state-funded contracts, the federal government has no involvement in such contracts (not a federal-aid contract) and no responsibility to oversee the implementation of this Special Provision by the Department on those contracts. DBE participation on 100 percent state-funded contracts will not be credited toward fulfilling the Department's annual overall DBE goal required by the US Department of Transportation to comply with the federal DBE program requirements.

CONTRACTOR ASSURANCE. The Contractor makes the following assurance and agrees to include the assurance in each subcontract that the Contractor signs with a subcontractor.

> The Contractor, subrecipient, or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of contracts funded in whole or in part with federal or state funds. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate.

OVERALL GOAL SET FOR THE DEPARTMENT. As a requirement of compliance with 49 CFR Part 26, the Department has set an overall goal for DBE participation in its federally assisted contracts. That goal applies to all federal-aid funds the Department will expend in its federally assisted contracts for the subject reporting fiscal year. The Department is required to make a good faith effort to achieve the overall goal. The dollar amount paid to all approved DBE companies performing work called for in this contract is eligible to be credited toward fulfillment of the Department's overall goal.

CONTRACT GOAL TO BE ACHIEVED BY THE CONTRACTOR. This contract includes a specific DBE utilization goal established by the Department. The goal has been included because the Department has determined that the work of this contract has subcontracting opportunities that may be suitable for performance by DBE companies. The determination is based on an assessment of the type of work, the location of the work, and the availability of DBE companies to do a part of the work. The assessment indicates that, in the absence of unlawful discrimination, and in an arena of fair and open competition, DBE companies can be expected to perform **15.00**% of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set for in this Special Provision:

(a) The bidder documents that enough DBE participation has been obtained to meet the goal: or

(b) The bidder documents that a good faith effort has been made to meet the goal, even though the effort did not succeed in obtaining enough DBE participation to meet the goal.

DBE LOCATOR REFERENCES. Bidders shall consult the IL UCP DBE Directory as a reference source for DBE-certified companies. In addition, the Department maintains a letting and item specific DBE locator information system whereby DBE companies can register their interest in providing quotes on particular bid items advertised for letting. Information concerning DBE companies willing to quote work for particular contracts may be obtained by contacting the Department's Bureau of Small Business Enterprises at telephone number (217)785-4611, or by visiting the Department's website at www.dot.il.gov.

BIDDING PROCEDURES. Compliance with this Special Provision is a material bidding requirement. The failure of the bidder to comply will render the bid not responsive.

(a) The bidder shall submit a Disadvantaged Business Utilization Plan on Department forms SBE 2025 and 2026 with the bid.

(b) The Utilization Plan shall indicate that the bidder either has obtained sufficient DBE participation commitments to meet the contract goal or has not obtained enough DBE participation commitments in spite of a good faith effort to meet the goal. The Utilization Plan shall further provide the name, telephone number, and telefax number of a responsible official of the bidder designated for purposes of notification of plan approval or disapproval under the procedures of this Special Provision.

(c) The Utilization Plan shall include a DBE Participation Commitment Statement, Department form SBE 2025, for each DBE proposed for the performance of work to achieve the contract goal. For bidding purposes, submission of the completed SBE 2025 forms, signed by the DBEs and faxed to the bidder will be acceptable as long as the original is available and provided upon request. All elements of information indicated on the said form shall be provided, including but not limited to the following:

(1) The names and addresses of DBE firms that will participate in the contract;

(2) A description, including pay item numbers, of the work each DBE will perform;

(3) The dollar amount of the participation of each DBE firm participating. The dollar amount of participation for identified work shall specifically state the quantity, unit price, and total subcontract price for the work to be completed by the DBE. If partial pay items are to be performed by the DBE, indicate the portion of each item, a unit price where appropriate and the subcontract price amount;

(4) DBE Participation Commitment Statements, form SBE 2025, signed by the bidder and each participating DBE firm documenting the commitment to use the DBE subcontractors whose participation is submitted to meet the contract goal;

(5) if the bidder is a joint venture comprised of DBE companies and non-DBE companies, the plan must also include a clear identification of the portion of the work to be performed by the DBE partner(s); and,

(6) If the contract goal if 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 is receives as a result of the lease arrangement.

(e) DBE as a material supplier:

(1) 60 percent goal credit for the cost of the materials or supplies purchased from a DBE regular dealer.

(2) 100 percent goal credit for the cost of materials of supplies obtained from a DBE manufacturer.

(3) 100 percent credit for the value of reasonable fees and commissions for the procurement of materials and supplies if not a 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, than 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 my 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.

FRICTION 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	Allowed Alone or in Combination [5/]: Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag Crushed Concrete
HMA Low ESAL	Stabilized Subbase or Shoulders	Allowed Alone or in Combination [5/]: Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag [1/] Crushed Concrete

<table>
<tr><th>Use</th><th>Mixture</th><th>Aggregates Allowed</th></tr>
<tr><td>HMA
High ESAL
Low ESAL</td><td>Binder
IL-19.0
or IL-19.0L

SMA Binder</td><td><u>Allowed Alone or in Combination</u> [5/]:

Crushed Gravel
Carbonate Crushed Stone[2/]
Crystalline Crushed Stone
Crushed Sandstone
Crushed Slag (ACBF)
Crushed Concrete[3/]</td></tr>
<tr><td>HMA
High ESAL
Low ESAL</td><td>C Surface and Leveling Binder
IL-9.5 or IL-9.5L

SMA
Ndesign 50 Surface</td><td><u>Allowed Alone or in Combination</u> [5/]:

Crushed Gravel
Carbonate Crushed Stone[2/]
Crystalline Crushed Stone
Crushed Sandstone
Crushed Slag (ACBF)
Crushed Steel Slag[4/]
Crushed Concrete[3/]</td></tr>
<tr><td rowspan="5">HMA
High ESAL</td><td rowspan="5">D Surface and Leveling Binder
IL-9.5

SMA
Ndesign 50
Surface</td><td><u>Allowed Alone or in Combination</u> [5/]:

Crushed Gravel
Carbonate Crushed Stone (other than Limestone)[2/]
Crystalline Crushed Stone
Crushed Sandstone
Crushed Slag (ACBF)
Crushed Steel Slag[4/]
Crushed Concrete[3/]</td></tr>
<tr><td><u>Other Combinations Allowed:</u>

Up to... | With...</td></tr>
<tr><td>25% Limestone | Dolomite</td></tr>
<tr><td>50% Limestone | Any Mixture D aggregate other than Dolomite</td></tr>
<tr><td>75% Limestone | Crushed Slag (ACBF) or Crushed Sandstone</td></tr>
<tr><td rowspan="3">HMA
High ESAL</td><td rowspan="3">E Surface
IL-9.5

SMA
Ndesign 80
Surface</td><td><u>Allowed Alone or in Combination</u> [5/]:

Crushed Gravel
Crystalline Crushed Stone
Crushed Sandstone
Crushed Slag (ACBF)
Crushed Steel Slag
Crushed Concrete[3/]

No Limestone.</td></tr>
<tr><td><u>Other Combinations Allowed:</u>

Up to... | With...</td></tr>
<tr><td></td></tr>
</table>

Use	Mixture	Aggregates Allowed	
		50% Dolomite[2/]	Any Mixture E aggregate
		75% Dolomite[2/]	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone
		75% Crushed Gravel or Crushed Concrete[3/]	Crushed Sandstone, Crystalline Crushed Stone, Crushed Slag (ACBF), or Crushed Steel Slag
HMA High ESAL	F Surface IL-9.5 SMA Ndesign 80 Surface	<u>Allowed Alone or in Combination</u> [5/]: Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag No Limestone.	
		<u>Other Combinations Allowed</u>:	
		Up to...	*With...*
		50% Crushed Gravel, Crushed Concrete[3/], or Dolomite[2/]	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone

1/ Crushed steel slag allowed in shoulder surface only.
2/ Carbonate crushed stone 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."

GRANULAR MATERIALS (BDE)
Effective: November 1, 2012

Revise the title of Article 1003.04 of the Standard Specifications to read:

"**1003.04 Fine Aggregate for Bedding, Trench Backfill, Embankment, Porous Granular Backfill, Sand Backfill for Underdrains, and French Drains.**"

Revise Article 1003.04(c) of the Standard Specifications to read:

"(c) Gradation. The fine aggregate gradations for granular embankment, granular backfill, bedding, and trench backfill for pipe culverts and storm sewers shall be FA 1, FA 2, or FA 6 through FA 21.

The fine aggregate gradation for porous granular embankment, porous granular backfill, french drains, and sand backfill for underdrains shall be FA 1, FA 2, or FA 20, except the percent passing the No. 200 (75 µm) sieve shall be 2±2."

Revise Article 1004.05(c) of the Standard Specifications to read:

"(c) Gradation. The coarse aggregate gradations shall be as follows.

Application	Gradation
Blotter	CA 15
Granular Embankment, Granular Backfill, Bedding, and Trench Backfill for Pipe Culverts and Storm Sewers	CA 6, CA 9, CA 10, CA 12, CA17, CA18, and CA 19
Porous Granular Embankment, Porous Granular Backfill, and French Drains	CA 7, CA 8, CA 11, CA 15, CA 16 and CA 18"

HOT-MIX ASPHALT - DENSITY TESTING OF LONGITUDINAL JOINTS (BDE)
Effective: January 1, 2010 Revised: April 1, 2012

Description. This work shall consist of testing the density of longitudinal joints as part of the quality control/quality assurance (QC/QA) of hot-mix asphalt (HMA). Work shall be according to Section 1030 of the Standard Specifications except as follows.

Quality Control/Quality Assurance (QC/QA). Delete the second and third sentence of the third paragraph of Article 1030.05(d)(3) of the Standard Specifications.

Add the following paragraphs to the end of Article 1030.05(d)(3) of the Standard Specifications:

"Longitudinal joint density testing shall be performed at each random density test location. Longitudinal joint testing shall be located at a distance equal to the lift thickness or a minimum of 4 in. (100 mm), from each pavement edge. (i.e. for a 5 in. (125 mm) lift the near edge of the density gauge or core barrel shall be within 5 in. (125 mm) from the edge of pavement.) Longitudinal joint density testing shall be performed using either a correlated nuclear gauge or cores.

a. Confined Edge. Each confined edge density shall be represented by a one-minute nuclear density reading or a core density and shall be included in the average of density readings or core densities taken across the mat which represents the Individual Test.

b. Unconfined Edge. Each unconfined edge joint density shall be represented by an average of three one-minute density readings or a single core density at the given density test location and shall meet the density requirements specified herein. The three one-minute readings shall be spaced ten feet apart longitudinally along the unconfined pavement edge and centered at the random density test location."

Revise the Density Control Limits table in Article 1030.05(d)(4) of the Standard Specifications to read:

"Mixture Composition	Parameter	Individual Test (includes confined edges)	Unconfined Edge Joint Density Minimum
IL-4.75	Ndesign = 50	93.0 – 97.4%	91.0%
IL-9.5, IL-12.5	Ndesign ≥ 90	92.0 – 96.0%	90.0%
IL-9.5,IL-9.5L, IL-12.5	Ndesign < 90	92.5 – 97.4%	90.0%
IL-19.0, IL-25.0	Ndesign ≥ 90	93.0 – 96.0%	90.0%
IL-19.0, IL-19.0L, IL-25.0	Ndesign < 90	93.0 – 97.4%	90.0%
SMA	Ndesign = 50 & 80	93.5 – 97.4%	91.0%
All Other	Ndesign = 30	93.0 - 97.4%	90.0%"

HOT-MIX ASPHALT – MIXTURE DESIGN COMPOSITION AND VOLUMETRIC REQUIREMENTS (BDE)

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

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)
IL-9.5, IL-9.5L	1 1/4 (32)
SMA-12.5	2 (51)
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 FA/FM 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."

Remove footnote 3/ from the tables and at the end of the tables in Article 1004.01(c) of the Standard Specifications.

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 1/ CA 16 and/or CA 13 CA 16
HMA Low ESAL	IL-19.0L IL-9.5L Stabilized Subbase or Shoulders	CA 11 1/ CA 16

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

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

"High ESAL	IL-19.0 binder; IL-9.5 surface
Low ESAL	IL-19.0L binder; IL-9.5L surface; Stabilized Subbase (HMA)1/; HMA Shoulders2/

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.

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.

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

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

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

High ESAL, MIXTURE COMPOSITION (% PASSING) [1/]								
Sieve Size	IL-19.0 mm		SMA 12.5 [4/]		IL-9.5 mm		IL-4.75 mm	
	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	90	99		100		100
3/8 in. (9.5 mm)			50	85	90	100		100
#4 (4.75 mm)	40	60	20	40	32	69	90	100
#8 (2.36 mm)	26	42	16	24 [5/]	32	52 [2/]	70	90
#16 (1.18 mm)	15	30			10	32	50	65
#50 (300 µm)	6	15			4	15	15	30
#100 (150 µm)	4	9			3	10	10	18
#200 (75 µm)	3	6	8.0	11.0 [3/]	4	6	7	9
Ratio Dust/Asphalt Binder		1.0				1.0		1.0 [3/]

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 24 percent."

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

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

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

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

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

2/ VFA for IL-4.75 shall be 76-83 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_{DES} =30	4.0	15.0	65-78
IL-19.0L	N_{DES} =30	4.0	13.5	N/A"

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

"(3) SMA Mixtures.

ESALs (million)	Ndesign	Design Air Voids Target %	Voids in the Mineral Aggregate (VMA), % min.	Voids Filled with Asphalt (VFA), %
≤ 10	50	4.0	16.0	75 – 80
> 10	80	4.0	17.0	75 – 80"

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

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

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

"Parameter	Frequency of Tests High ESAL Mixture Low ESAL Mixture	Test Method See Manual of Test Procedures for Materials
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	Illinois-Modified AASHTO R 35
	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)	
Air Voids Bulk Specific Gravity of Gyratory Sample Note 4.	Day's production ≥ 1200 tons: 1 per half day of production	Illinois-Modified AASHTO T 312
	Day's production < 1200 tons: 1 per half day of production for first 2 days and 1 per day thereafter (first sample of the day)	
Maximum Specific Gravity of Mixture	Day's production ≥ 1200 tons: 1 per half day of production	Illinois-Modified AASHTO T 209
	Day's production < 1200 tons: 1 per half day of production for first 2 days and 1 per day thereafter (first sample of the day)	

Note 1. The 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 ± 5 °F (132 ± 3 °C) for quality control testing. The WMA compaction temperature for quality assurance testing will be 270 ± 5 °F (132 ± 3 °C) if the mixture is not allowed to cool to room temperature. If the mixture is allowed to cool to room temperature, it shall be reheated to standard HMA compaction temperatures."

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 Low ESAL		SMA		IL-4.75	
	Individual Test	Moving Avg. of 4	Individual Test	Moving Avg. of 4	Individual Test	Moving Avg. of 4
% Passing: 1/						
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 % 2/	-0.5 % 2/	-0.7 % 2/	-0.5 % 2/	-0.7 % 2/	-0.5 % 2/

1/ Based on washed ignition oven

2/ Allowable limit below minimum design VMA requirement

DENSITY CONTROL LIMITS		
Mixture Composition	Parameter	Individual Test
IL-4.75	Ndesign = 50	93.0 - 97.4 % 1/
IL-9.5	Ndesign = 90	92.0 - 96.0 %
IL-9.5,IL-9.5L	Ndesign < 90	92.5 - 97.4 %
IL-19.0	Ndesign = 90	93.0 - 96.0 %
IL-19.0, IL-19.0L	Ndesign < 90	93.0 2/- 97.4 %
SMA	Ndesign = 50 & 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 1/ 3/	% Passing Sieves: 1/2 in. (12.5 mm) 2/ No. 4 (4.75 mm) No. 8 (2.36 mm) No. 30 (600 µm)
Total Dust Content 1/	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.

HOT-MIX ASPHALT – MIXTURE DESIGN VERIFICATION AND PRODUCTION (BDE)
Effective: November 1, 2013 Revised: November 1, 2014

Description. This special provision provides 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. This special provision also provides the plant requirements for hydrated lime addition systems used in the production of High ESAL, IL-4.75, and SMA mixes.

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 (Illinois Modified AASHTO T 324) and the Tensile Strength Test (Illinois Modified 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 necessary changes to the mix and provide passing Hamburg Wheel and tensile strength test results from a private lab. The Department will verify the passing results.

All new and renewal mix designs shall meet the following requirements for verification testing.

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

Illinois Modified AASHTO T 324 Requirements [1/]

PG Grade	Number of Passes
PG 58-xx (or lower)	5,000
PG 64-xx	7,500
PG 70-xx	15,000
PG 76-xx (or higher)	20,000

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.

(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 550 kPa (80 psi) 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 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."

System for Hydrated Lime Addition. Revise the fourth sentence of the third paragraph of Article 1030.04(c) of the Standard Specifications to read:

"The method of application shall be according to Article 1102.01(a)(10)."

Replace the first three sentences of the second paragraph of Article 1102.01(a)(10) of the Standard Specifications to read:

"When hydrated lime is used as the anti-strip additive, a separate bin or tank and feeder system shall be provided to store and accurately proportion the lime onto the aggregate either as a slurry, as dry lime applied to damp aggregates, or as dry lime injected onto the hot aggregates prior to adding the liquid asphalt cement. If the hydrated lime is added either as a slurry or as dry lime on damp aggregates, the lime and aggregates shall be mixed by a power driven pugmill to provide a uniform coating of the lime prior to entering the dryer. If dry hydrated lime is added to the hot dry aggregates in a dryer-drum plant, the lime shall be added in such a manner that the lime will not become entrained into the air stream of the dryer-drum and that thorough dry mixing shall occur prior to the injection point of the liquid asphalt. When a batch plant is used, the hydrated lime shall be added to the mixture in the weigh hopper or as approved by the Engineer."

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

"For 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.

If an anti-stripping additive is required for any other HMA mix, the cost of the additive will be paid for according to Article 109.04. The cost incurred in introducing the additive into 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 – 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 ± 0.01 (1.21 kg/sq m ±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."

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	V	V	V
78	II	II	III	IV	2020	2370	2730
84	II	II	III	IV	2020	2380	2740
90	II	II	III	1680	2030	2390	2750
96	II	III	III	1690	2040	2400	2750
102	II	III	III	1700	2050	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 Fill Height: 1 m and less 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	Type 5 Fill Height: Greater than 6 m not exceeding 7.5 m	Type 6 Fill Height: Greater than 7.5 m not exceeding 9 m	Type 7 Fill Height: 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	V	V	V
1950	II	II	III	IV	100	110	130
2100	II	II	III	IV	100	110	130
2250	II	II	III	80	100	110	130
2400	II	III	III	80	100	110	130
2550	II	III	III	80	100	120	130
2700	II	III	70	80	100	120	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 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'		
	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			(0.079)		
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)	0.109	(0.109)	0.079	0.079	(0.109)	0.079	(0.109)	0.109	(0.109)	0.109	(0.138)	(0.109)	0.109	(0.138E)	0.109	0.109	(0.138E)	0.109	(0.138)
54	0.109	(0.109)	0.109	(0.109)	0.079	0.079	0.109	(0.109)	0.109	0.109	(0.109)	0.109	(0.138)	0.109	0.109	(0.138E)	0.109	(0.138)	(0.138E)	0.138	0.138
60	0.109	0.109	0.109	0.109	0.079	(0.109)	0.109	(0.109)	0.109	0.109	(0.109)	0.109	(0.138)	0.109	0.109	(0.138E)	(0.138)	(0.138)	0.138E	(0.138E)	(0.138E)
66	(0.138)	0.109	0.109	0.109	0.079	(0.109)	0.109	(0.109)	0.109	0.109	0.109	0.109	(0.138)	0.109	(0.138)	(0.138E)	0.138	0.138	0.138E	(0.138E)	0.138E
72	0.138	0.109	(0.138)	0.138	(0.109)	(0.109)	0.138	(0.109)	0.109	0.138	0.109	0.109	0.138	(0.138)	(0.138)	(0.168E)	(0.138E)	0.138E	(0.168E)	(0.138E)	0.138E
78	0.168	0.109	(0.138)	0.168	(0.109)	0.109	0.168	0.109	0.109	0.168	0.109	(0.138)	0.168	(0.138)	(0.138)	H0.168E	(0.138E)	0.138E	H0.168E	0.138E	(0.168E)
84	0.168	(0.138)	(0.138)	0.168	(0.109)	0.109	0.168	0.109	0.109	0.168	0.109	(0.138)	0.168	(0.138)	0.138	H0.168E	(0.138E)	0.138E	H0.168E	(0.168E)	(0.168E)
90		(0.138)	(0.138)		(0.109)	0.109		0.109	0.109		(0.138)	(0.138)		(0.138)	0.138		0.138E	(0.168E)		(0.168E)	(0.168E)
96		(0.138)	(0.138)		(0.109)	0.109		0.109	0.109		(0.138)	(0.138)		(0.138)	0.138		(0.168E)	(0.168E)		(0.168E)	(0.168E)
102		0.109Z	0.109Z		(0.109)	0.109		0.109	(0.138)		(0.138)	(0.138)		(0.138)	0.138		(0.168E)	(0.168E)		H0.138E	H0.168E
108		0.109Z	(0.138Z)		0.109	0.109		0.109	(0.138)		(0.138)	0.138		0.138	(0.168)		(0.168E)	(0.168E)		H0.138E	H0.168E
114		0.109Z	(0.138Z)		0.109	0.109		0.109	(0.138)		(0.138)	0.138		(0.168)	(0.168)		(0.168E)	0.168E		H0.138E	H0.168E
120		0.109Z	(0.138Z)		0.109	0.109		(0.138)	(0.138)		(0.138)	0.138		(0.168)	(0.168)		H0.138E	H0.168E		H0.168E	H0.168E
126		0.138Z	0.138Z		0.138	0.138		0.138	0.138		0.138	(0.168)		(0.168)	(0.168)		H0.138E	H0.168E		H0.168E	H0.168E
132		0.138Z	0.138Z		0.138	0.138		0.138	0.138		(0.168)	(0.168)		0.168	0.168		H0.138E	H0.168E		H0.168E	H0.168E
138		0.138Z	0.138Z		0.138	0.138		0.138	0.138		(0.168)	(0.168)		(0.168E)	H0.168E		H0.168E	H0.168E		H0.168E	
144		0.168Z	0.168Z		0.168	0.168		0.168	0.168		0.168	0.168		H0.168E	H0.168E		H0.168E	H0.168E		H0.168E	

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 542.04(e)
Z 1'-6" Minimum fill

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: 1 m and less 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			Type 5 Fill Height: Greater than 6 m not exceeding 7.5 m			Type 6 Fill Height: Greater than 7.5 m not exceeding 9 m			Type 7 Fill Height: Greater than 9 m not exceeding 10.5 m		
	68 x 13 mm	75 x 25 mm	125 x 25 mm	68 x 13 mm	75 x 25 mm	125 x 25 mm	68 x 13 mm	75 x 25 mm	125 x 25 mm	68 x 13 mm	75 x 25 mm	125 x 25 mm	68 x 13 mm	75 x 25 mm	125 x 25 mm	68 x 13 mm	75 x 25 mm	125 x 25 mm	68 x 13 mm	75 x 25 mm	125 x 25 mm
300	1.63			1.63			1.63			1.63			1.63			1.63			1.63		
375	1.63			1.63			1.63			1.63			1.63			1.63			(2.01)		
450	(2.01)			1.63			1.63			1.63			1.63			(2.01)			(2.01)		
525	(2.01)			1.63			1.63			1.63			(2.01)			(2.01)			(2.01)		
600	(2.01)			1.63			1.63			1.63			(2.01)			(2.01)			(2.77)		
750	(2.77E)			1.63			1.63			(2.01)			(2.01)			(2.77)			2.77		
900	(2.77E)			1.63			(2.01)			(2.01)			(2.77)			2.77			(3.51E)		
1050	2.01			1.63			(2.01)			(2.01)			(2.77)			(2.77E)			(2.77E)		
1200	2.77	(2.77)	2.77	(2.77)	2.01	2.01	(2.77)	2.01	(2.77)	2.77	(2.77)	2.77	(3.51)	(2.77)	2.77	(3.51E)	2.77	2.77	(3.51E)	2.77	(3.51)
1350	2.77	(2.77)	2.77	(2.77)	2.01	2.01	2.77	(2.77)	2.77	2.77	(2.77)	2.77	(3.51)	2.77	2.77	(3.51E)	2.77	(3.51)	(3.51E)	3.51	3.51
1500	2.77	2.77	2.77	2.77	2.01	(2.77)	2.77	(2.77)	2.77	2.77	(2.77)	2.77	(3.51)	2.77	2.77	(3.51E)	(3.51)	(3.51)	3.51E	(3.51E)	(3.51E)
1650	(3.51)	2.77	2.77	2.77	2.01	(2.77)	2.77	(2.77)	2.77	2.77	2.77	2.77	(3.51)	2.77	(3.51)	(3.51E)	3.51	3.51	3.51E	(3.51E)	3.51E
1800	3.51	2.77	(3.51)	3.51	(2.77)	(2.77)	3.51	(2.77)	2.77	3.51	2.77	2.77	3.51	(3.51)	(3.51)	(4.27E)	(3.51E)	3.51E	(4.27E)	(3.51E)	3.51E
1950	4.27	2.77	(3.51)	4.27	(2.77)	2.77	4.27	2.77	2.77	4.27	2.77	(3.51)	4.27	(3.51)	(3.51)	H 4.27E	(3.51E)	3.51E	H 4.27E	3.51E	(4.27E)
2100	4.27	(3.51)	(3.51)	4.27	(2.77)	2.77	4.27	2.77	2.77	4.27	2.77	(3.51)	4.27	(3.51)	3.51	H 4.27E	(3.51E)	3.51E	H 4.27E	(4.27E)	(4.27E)
2250		(3.51)	(3.51)		(2.77)	2.77		2.77	2.77		(3.51)	(3.51)		(3.51)	3.51		3.51E	(4.27E)		(4.27E)	(4.27E)
2400		(3.51)	(3.51)		(2.77)	2.77		2.77	2.77		(3.51)	(3.51)		(3.51)	3.51		(4.27E)	(4.27E)		(4.27E)	(4.27E)
2550		2.77Z	2.77Z		(2.77)	2.77		2.77	(3.51)		(3.51)	(3.51)		(3.51)	3.51		(4.27E)	(4.27E)		H 3.51E	H 4.27E
2700		2.77Z	(3.51Z)		2.77	2.77		2.77	(3.51)		(3.51)	3.51		3.51	(4.27)		(4.27E)	(4.27E)		H 3.51E	H 4.27E
2850		2.77Z	(3.51Z)		2.77	2.77		2.77	(3.51)		(3.51)	3.51		(4.27)	(4.27)		(4.27E)	4.27E		H 3.51E	H 4.27E
3000		2.77Z	(3.51Z)		2.77	2.77		(3.51)	(3.51)		(3.51)	3.51		(4.27)	(4.27)		H 3.51E	H 4.27E		H 4.27E	H 4.27E
3150		3.51Z	3.51Z		3.51	3.51		3.51	3.51		3.51	(4.27)		(4.27)	(4.27)		H 3.51E	H 4.27E		H 4.27E	H 4.27E
3300		3.51Z	3.51Z		3.51	3.51		3.51	3.51		(4.27)	(4.27)		4.27	4.27		H 3.51E	H 4.27E		H 4.27E	H 4.27E
3450		3.51Z	3.51Z		3.51	3.51		3.51	3.51		(4.27)	(4.27)		(4.27E)	H 4.27E		H 4.27E	H 4.27E		H 4.27E	
3600		4.27Z	4.27Z		4.27	4.27		4.27	4.27		4.27	4.27		H 4.27E	H 4.27E		H 4.27E	H 4.27E		H 4.27E	

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

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 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'	
	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		(0.075)	
18	(0.075)		0.060		0.060		0.060		0.060		(0.075)		H 0.060	
21	H 0.060E		0.060		0.060		0.060		(0.075)		H 0.060		H 0.060E	
24	(0.105E)		0.060		0.060		(0.075)		(0.105)		(0.105)		(0.105E)	
30	H 0.075E	H 0.060	0.075	H 0.060	0.075	H 0.060	(0.105)	H 0.060	(0.105)	H 0.060	H 0.075E	H 0.060	H 0.075E	H 0.060
36	(0.135E)	H 0.060E	0.075	H 0.060	(0.105)	H 0.060	(0.105)	H 0.060	(0.135)	H 0.060	H 0.075E	H 0.060	H 0.075E	H 0.060E
42	0.105E	(0.075)	0.105	0.060	0.105	0.060	0.105	0.060	0.105	(0.075)	0.105E	0.105	0.105E	(0.105E)
48	0.105E	(0.075)	0.105	0.060	0.105	0.060	0.105	(0.075)	0.105	(0.105)	0.105E	(0.105E)	0.105E	(0.135E)
54	0.105E	(0.105)	0.105	0.060	0.105	0.060	0.105	(0.075)	0.105	(0.105)	0.105E	(0.105E)	(0.135E)	(0.135E)
60	0.135E	(0.105)	0.135	0.060	0.135	(0.075)	0.135	(0.105)	0.135	(0.105)	0.135E	(0.135E)	(0.164E)	(0.135E)
66	0.164E	(0.105)	0.164	0.060	0.164	(0.075)	0.164	(0.105)	0.164	(0.135)	0.164E	(0.135E)	H 0.164E	(0.135E)
72	0.164E	(0.105)	0.164	0.060	0.164	(0.075)	0.164	(0.105)	0.164	(0.135)	H 0.164E	(0.135E)	H 0.164E	(0.164E)
78		(0.135)		0.075		(0.105)		(0.105)		(0.135)		(0.135E)		(0.164E)
84		(0.135)		0.105		0.105		(0.135)		(0.135)		(0.164E)		(0.164E)
90		(0.135)		0.105		0.105		(0.135)		(0.135)		(0.164E)		(0.164E)
96		(0.135)		0.105		0.105		(0.135)		(0.135)		(0.164E)		H 0.135E
102		0.135Z		0.135		0.135		0.135		(0.164)		(0.164E)		H 0.135E
108		0.135Z		0.135		0.135		0.135		(0.164)		(0.164E)		H 0.164E
114		0.164Z		0.164		0.164		0.164		0.164		H 0.164E		H 0.164E
120		0.164Z		0.164		0.164		0.164		0.164		H 0.164E		

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

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)	(3.43E)	(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)	(4.17E)	(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	(3.43E)	H 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)	H 4.17E	(3.43E)	H 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		

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

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 1/2"		Corrugated Steel & Aluminum Pipe Arch 3" x 1"		Corrugated Steel Pipe Arch 5" x 1"		Min. Cover	Type 1					Type 2					Type 3				
								Fill Height: 3' and less					Fill Height: Greater than 3' not exceeding 10'					Fill Height: Greater than 10' not exceeding 15'				
	Span (in.)*	Rise (in.)	Span (in.)	Rise (in.)	Span (in.)	Rise (in.)	Steel & Aluminum	Steel			Aluminum		Steel			Aluminum		Steel			Aluminum	
								2 2/3" x 1/2"	3"x1"	5" x 1"	2 2/3" x 1/2"	3"x1"	2 2/3" x 1/2"	3"x1"	5" x 1"	2 2/3" x 1/2"	3"x1"	2 2/3" x 1/2"	3"x1"	5" x 1"	2 2/3" x 1/2"	3"x1"
15	17	13					1'-6"	0.064			0.060		0.064			0.060		0.064			0.060	
18	21	15					1'-6"	0.064			0.060		0.064			0.060		0.064			0.060	
21	24	18					1'-6"	0.064			(0.075)		0.064			0.060		0.064			0.060	
24	28	20					1'-6"	(0.079)			(0.105)		0.064			0.075		0.064			0.075	
30	35	24					1'-6"	(0.079)			(0.105)		0.064			0.075		(0.079)			(0.105)	
36	42	29					1'-6"	(0.079)			0.105		0.064			0.105		0.064			0.105	
42	49	33					1'-6"	0.109			0.105		(0.109)			0.105		(0.109)			0.105	
48	57	38	53	41	53	41	1'-6"	0.109	(0.109)	(0.109)	0.135	0.060	0.109	0.079	0.079	0.135	0.060	0.109	0.079	(0.109)	0.135	0.060
54	64	43	60	46	60	46	1'-6"	0.109	(0.109)	0.109	0.164	(0.075)	0.109	0.079	0.079	0.164	0.060	0.109	(0.109)	0.109	0.164	(0.075)
60	71	47	66	51	66	51	1'-6"	0.138	(0.109)	0.109	0.164	(0.075)	0.138	0.079	(0.109)	0.164	0.060	0.138	(0.109)	0.109	0.164	(0.075)
66	77	52	73	55	73	55	1'-6"	0.168	(0.109)	0.109		0.075	0.168	0.079	(0.109)		0.075	0.168	(0.109)	0.109		0.075
72	83	57	81	59	81	59	1'-6"	0.168	(0.109)	0.109		0.105	0.168	0.079	(0.109)		0.105	0.168	(0.109)	0.109		0.105
78			87	63	87	63	1'-6"		0.109	0.109		0.105		(0.109)	0.109		0.105		0.109	0.109		0.105
84			95	67	95	67	1'-6"		0.109	0.109		0.105		(0.109)	0.109		0.105		0.109	0.109		0.105
90			103	71	103	71	1'-6"		0.109	0.109		0.135		(0.109)	0.109		0.135		0.109	0.109		0.135
96			112	75	112	75	1'-6"		0.109	(0.138)		0.164		0.109	0.109		0.164		0.109	(0.138)		0.164
102			117	79	117	79	1'-6"		0.109	(0.138)		0.164		0.109	0.109		0.164		0.109	(0.138)		0.164
108			128	83	128	83	1'-6"		0.138	0.138				0.138	0.138				0.138	0.138		
114			137	87	137	87	1'-6"		0.138	0.138				0.138	0.138				0.138	0.138		
120			142	91	142	91	1'-6"		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 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.

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				
								Steel			Aluminum		Steel			Aluminum		Steel			Aluminum	
	Span (mm)*	Rise (mm)	Span (mm)	Rise (mm)	Span (mm)	Rise (mm)	Steel & Aluminum	68 x 13 mm	75 x 25 mm	125 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	125 x 25 mm	68 x 13 mm	75 x 25 mm	68 x 13 mm	75 x 25 mm	125 x 25 mm	68 x 13 mm	75 x 25 mm
375	430	330					0.5 m	1.63			1.52		1.63			1.52		1.63			1.52	
450	530	380					0.5 m	1.63			1.52		1.63			1.52		1.63			1.52	
525	610	460					0.5 m	1.63			(1.91)		1.63			1.52		1.63			1.52	
600	710	510					0.5 m	(2.01)			(2.67)		1.63			1.91		1.63			1.91	
750	870	630					0.5 m	(2.01)			(2.67)		1.63			1.91		(2.01)			(2.67)	
900	1060	740					0.5 m	(2.01)			2.67		1.63			2.67		1.63			2.67	
1050	1240	840					0.5 m	2.77			2.67		(2.77)			2.67		(2.77)			2.67	
1200	1440	970	1340	1050	1340	1050	0.5 m	2.77	(2.77)	(2.77)	3.43	1.52	2.77	2.01	2.01	3.43	1.52	2.77	2.01	(2.77)	3.43	1.52
1350	1620	1100	1520	1170	1520	1170	0.5 m	2.77	(2.77)	2.77	4.17	(1.91)	2.77	2.01	2.01	4.17	1.52	2.77	(2.77)	2.77	4.17	(1.91)
1500	1800	1200	1670	1300	1670	1300	0.5 m	3.51	(2.77)	2.77	4.17	(1.91)	3.51	2.01	(2.77)	4.17	1.52	3.51	(2.77)	2.77	4.17	(1.91)
1650	1950	1320	1850	1400	1850	1400	0.5 m	4.27	(2.77)	2.77		1.91	4.27	2.01	(2.77)		1.91	4.27	(2.77)	2.77		1.91
1800	2100	1450	2050	1500	2050	1500	0.5 m	4.27	(2.77)	2.77		2.67	4.27	2.01	(2.77)		2.67	4.27	(2.77)	2.77		2.67
1950			2200	1620	2200	1620	0.5 m		2.77	2.77		2.67		(2.77)	2.77		2.67		2.77	2.77		2.67
2100			2400	1720	2400	1720	0.5 m		2.77	2.77		2.67		(2.77)	2.77		2.67		2.77	2.77		2.67
2250			2600	1820	2600	1820	0.5 m		2.77	2.77		3.43		(2.77)	2.77		3.43		2.77	2.77		3.43
2400			2840	1920	2840	1920	0.5 m		2.77	(3.51)		4.17		2.77	2.77		4.17		2.77	(3.51)		4.17
2550			2970	2020	2970	2020	0.5 m		2.77	(3.51)		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		
2850			3470	2220	3470	2220	0.5 m		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		

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.

Table IIB: CLASSES OF REINFORCED CONCRETE ELLIPTICALL 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	
						Fill Height: 3' and less		Fill Height: Greater than 3' not exceeding 10'		Fill Height: Greater than 10' not exceeding 15'	
	Span	Rise	Span	Rise	RCCP HE & A	HE	Arch	HE	Arch	HE	Arch
15	23	14	18	11	1' -0"	HE-III	A-III	HE-III	A-III	HE-IV	A-IV
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-II	HE-III	A-III	HE-IV	A-IV
48	60	38	58 1/2	36	1' -0"	HE-I	A-II	HE-III	A-III	1460	1450
54	68	43	65	40	1' -0"	HE-I	A-II	HE-III	A-III	1460	1460
60	76	48	73	45	1' -0"	HE-I	A-II	HE-III	A-III	1460	1470
66	83	53	88	54	1' -0"	HE-I	A-II	HE-III	A-III	1470	1480
72	91	58	88	54	1' -0"	HE-I	A-II	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

Table IIB: CLASSES OF REINFORCED CONCRETE ELLIPTICALL 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	
						Fill Height: 1 m and less		Fill Height: Greater than 1 m not exceeding 3 m		Fill Height: Greater than 3 m not exceeding 4.5 m	
	Span	Rise	Span	Rise	RCCP HE & A	HE	Arch	HE	Arch	HE	Arch
375	584	356	457	279	0.3 m	HE-III	A-III	HE-III	A-III	HE-IV	A-IV
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	CPE	CPP	PVC	CPVC	PE	CPP
10	X	X	X	X	NA	X	X	X	X	NA	X	X	X	X	NA	X	X	X	NA
12	X	X	X	X	X	X	X	X	X	X	X	X	X	NA	X	X	X	X	NA
15	X	X	NA	X	X	X	X	NA	X	X	X	X	NA	NA	X	X	X	NA	X
18	X	X	X	X	X	X	X	X	X	X	X	X	X	NA	X	X	X	X	NA
21	X	X	NA	NA	NA	X	X	NA	NA	NA	X	X	NA	NA	NA	X	X	NA	NA
24	X	X	X	X	X	X	X	X	X	X	X	X	NA	NA	NA	X	X	X	NA
30	X	X	X	X	X	X	X	X	X	X	X	X	X	NA	X	X	X	X	NA
36	X	X	X	X	X	X	X	X	X	X	X	X	X	NA	NA	X	X	X	NA
42	X	NA	X	X	NA	X	NA	X	NA	NA	X	NA	X	NA	NA	X	NA	X	NA
48	X	NA	X	X	X	X	NA	X	NA	NA	X	NA	X	NA	NA	X	NA	X	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

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					Type 2					Type 3					Type 4			
	Fill Height: 1 m and less, with 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			
	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	NA	X	X	X	NA
300	X	X	X	X	X	X	X	X	X	X	X	X	X	NA	X	X	X	X	NA
375	X	X	NA	X	X	X	X	NA	X	X	X	X	NA	NA	X	X	X	NA	X
450	X	X	X	X	X	X	X	X	X	X	X	X	X	NA	X	X	X	X	NA
525	X	X	NA	NA	NA	X	X	NA	NA	NA	X	X	NA	NA	NA	X	X	NA	NA
600	X	X	X	X	X	X	X	X	X	X	X	X	NA	NA	NA	X	X	X	NA
750	X	X	X	X	X	X	X	X	X	X	X	X	X	NA	X	X	X	X	NA
900	X	X	X	X	X	X	X	X	X	X	X	X	X	NA	NA	X	X	X	NA
1000	X	NA	X	X	NA	X	NA	X	NA	NA	X	NA	X	NA	NA	X	NA	X	NA
1200	X	NA	X	X	X	X	NA	X	NA	NA	X	NA	X	NA	NA	X	NA	X	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

TABLE IIIB: 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		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

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”

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 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."

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	NA	1	*X	X	X	X	X	NA
12	IV	NA	X	X	X	X	X	X	II	1	*X	X	X	X	X	X
15	IV	NA	NA	X	X	NA	X	X	II	1	*X	X	X	NA	X	X
18	IV	NA	NA	X	X	X	X	X	II	2	X	X	X	X	X	X
21	III	NA	NA	X	X	NA	NA	NA	II	2	X	X	X	NA	NA	NA
24	III	NA	NA	X	X	X	X	X	II	2	X	X	X	X	X	X
27	III	NA	NA	NA	NA	NA	NA	NA	II	3	X	NA	NA	NA	NA	NA
30	IV	NA	NA	X	X	X	X	X	II	3	X	X	X	X	X	X
33	III	NA	NA	NA	NA	NA	NA	NA	II	NA	X	NA	NA	NA	NA	NA
36	III	NA	NA	X	X	X	X	X	II	NA	X	X	X	X	X	X
42	II	NA	X	X	NA	X	X	NA	II	NA	X	X	NA	X	NA	NA
48	II	NA	X	X	NA	X	X	X	II	NA	X	X	NA	X	NA	NA
54	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA
60	II	NA	NA	NA	NA	NA	NA	X	II	NA	NA	NA	NA	NA	NA	X
66	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA
72	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA
78	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA
84	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA
90	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA
96	II	NA	NA	NA	NA	NA	NA	NA	III	NA	NA	NA	NA	NA	NA	NA
102	II	NA	NA	NA	NA	NA	NA	NA	III	NA	NA	NA	NA	NA	NA	NA
108	II	NA	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

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	NA	1	*X	X	X	X	X	NA
300	IV	NA	X	X	X	X	X	X	II	1	*X	X	X	X	X	X
375	IV	NA	NA	X	X	NA	X	X	II	1	*X	X	X	NA	X	X
450	IV	NA	NA	X	X	X	X	X	II	2	X	X	X	X	X	X
525	III	NA	NA	X	X	NA	NA	NA	II	2	X	X	X	NA	NA	NA
600	III	NA	NA	X	X	X	X	X	II	2	X	X	X	X	X	X
675	III	NA	NA	NA	NA	NA	NA	NA	II	3	X	NA	NA	NA	NA	NA
750	IV	NA	NA	X	X	X	X	X	II	3	X	X	X	X	X	X
825	III	NA	NA	NA	NA	NA	NA	NA	II	NA	X	NA	NA	NA	NA	NA
900	III	NA	NA	X	X	X	X	X	II	NA	X	X	X	X	X	X
1050	II	NA	X	X	NA	X	X	NA	II	NA	X	X	NA	X	NA	NA
1200	II	NA	X	X	NA	X	X	X	II	NA	X	X	NA	X	NA	NA
1350	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA
1500	II	NA	NA	NA	NA	NA	NA	X	II	NA	NA	NA	NA	NA	NA	X
1650	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA
1800	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA
1950	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA
2100	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA
2250	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA	NA	NA	NA	NA	NA
2400	II	NA	NA	NA	NA	NA	NA	NA	III	NA	NA	NA	NA	NA	NA	NA
2550	II	NA	NA	NA	NA	NA	NA	NA	III	NA	NA	NA	NA	NA	NA	NA
2700	II	NA	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

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	X	NA	NA	3	X	X	X	X	NA
12	III	2	X	X	X	X	NA	X	IV	NA	NA	X	X	X	NA
15	III	3	X	X	X	NA	NA	X	IV	NA	NA	X	X	NA	X
18	III	NA	X	X	X	X	NA	X	IV	NA	NA	X	X	X	NA
21	III	NA	NA	X	X	NA	NA	NA	IV	NA	NA	X	X	NA	NA
24	III	NA	NA	X	X	X	NA	NA	IV	NA	NA	X	X	X	NA
27	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
30	III	NA	NA	X	X	X	NA	X	IV	NA	NA	X	X	X	NA
33	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
36	III	NA	NA	X	X	X	NA	NA	IV	NA	NA	X	X	X	NA
42	III	NA	NA	X	NA	X	NA	NA	IV	NA	NA	X	NA	X	NA
48	III	NA	NA	X	NA	X	NA	NA	IV	NA	NA	X	NA	X	NA
54	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
60	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
66	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
72	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
78	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
84	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
90	III	NA	NA	NA	NA	NA	NA	NA	1680	NA	NA	NA	NA	NA	NA
96	III	NA	NA	NA	NA	NA	NA	NA	1690	NA	NA	NA	NA	NA	NA
102	III	NA	NA	NA	NA	NA	NA	NA	1700	NA	NA	NA	NA	NA	NA
108	1360	NA	NA	NA	NA	NA	NA	NA	1710	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 Iinterior
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						
	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP	RCCP	CSP	ESCP	PVC	CPVC	PE	CPP
250	NA	2	X	X	X	X	X	NA	NA	3	X	X	X	X	NA
300	III	2	X	X	X	X	NA	X	IV	NA	NA	X	X	X	NA
375	III	3	X	X	X	NA	NA	X	IV	NA	NA	X	X	NA	X
450	III	NA	X	X	X	X	NA	X	IV	NA	NA	X	X	X	NA
525	III	NA	NA	X	X	NA	NA	NA	IV	NA	NA	X	X	NA	NA
600	III	NA	NA	X	X	X	NA	NA	IV	NA	NA	X	X	X	NA
675	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
750	III	NA	NA	X	X	X	NA	X	IV	NA	NA	X	X	X	NA
825	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
900	III	NA	NA	X	X	X	NA	NA	IV	NA	NA	X	X	X	NA
1050	III	NA	NA	X	NA	X	NA	NA	IV	NA	NA	X	NA	X	NA
1200	III	NA	NA	X	NA	X	NA	NA	IV	NA	NA	X	NA	X	NA
1350	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
1500	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
1650	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
1800	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
1950	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
2100	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
2250	III	NA	NA	NA	NA	NA	NA	NA	80	NA	NA	NA	NA	NA	NA
2400	III	NA	NA	NA	NA	NA	NA	NA	80	NA	NA	NA	NA	NA	NA
2550	III	NA	NA	NA	NA	NA	NA	NA	80	NA	NA	NA	NA	NA	NA
2700	70	NA	NA	NA	NA	NA	NA	NA	80	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.

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
250	NA	X	X	NA	X	X	NA	X
300	IV	X	X	V	X	X	V	X
375	IV	X	X	V	X	X	V	X
450	IV	X	X	V	X	X	V	X
525	IV	X	X	V	X	X	V	X
600	IV	X	X	V	X	X	V	X
675	IV	NA	NA	V	NA	NA	V	NA
750	IV	X	X	V	X	X	V	X
825	IV	NA	NA	V	NA	NA	V	NA
900	IV	X	X	V	X	X	V	X
1050	IV	X	NA	V	X	NA	V	NA
1200	IV	X	NA	V	X	NA	V	NA
1350	IV	NA	NA	V	NA	NA	V	NA
1500	IV	NA	NA	V	NA	NA	V	NA
1650	IV	NA	NA	V	NA	NA	V	NA
1800	V	NA	NA	V	NA	NA	V	NA
1950	100	NA	NA	110	NA	NA	130	NA
2100	100	NA	NA	110	NA	NA	130	NA
2250	100	NA	NA	110	NA	NA	130	NA
2400	100	NA	NA	120	NA	NA	130	NA
2550	100	NA	NA	120	NA	NA	130	NA
2700	100	NA	NA	120	NA	NA	130	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.

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."

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."

PAVED SHOULDER REMOVAL (BDE)
Effective: April 1, 2014

Revise the first paragraph of Article 440.07(b) of the Standard Specifications to read:

"(b) Measured Quantities. Pavement removal, driveway pavement removal, and paved shoulder removal will be measured for payment in place and the area computed in square yards (square meters)."

Revise Article 440.07(c) of the Standard Specifications to read:

"(c) Adjustment of Quantities. The quantity of pavement removal and paved shoulder removal will be adjusted if their respective thickness varies more than 15 percent from that shown on the plans. The quantity will be either increased or decreased according to the following table.

% change of thickness	% change of quantity
0 to less than 15	0
15 to less than 20	10
20 to less than 30	15
30 to less than 50	20

If the thickness of the existing pavement varies by 50 percent or more from that shown on the plans, the character of the work will be considered significantly changed and an adjustment to the contract will be made according to Article 104.02.

When an adjustment is made for variations in pavement or shoulder thickness a resulting adjustment will also be made in the earthwork quantities when applicable.

No adjustment will be made for variations in the amount of reinforcement."

PAVEMENT MARKING BLACKOUT TAPE (BDE)
Effective: November 1, 2014

Revise the fourth paragraph of Article 701.04 of the Standard Specifications to read:

"The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned from the view of motorists. All existing pavement markings which conflict with the revised traffic pattern shall be removed according to Section 783 or when specified, temporarily covered with pavement marking blackout tape. The width of blackout tape shall be at least 1 in. (25 mm) wider than the width of the pavement marking being covered. The removing or covering of existing markings shall be scheduled immediately to facilitate the revised traffic pattern. If darkness or inclement weather prohibits the removal or covering operations, such operations shall be resumed the next morning or when weather permits."

Revise Article 701.19(f) of the Standard Specifications to read:

"(f) Removal of existing pavement markings and raised reflective pavement markers will be measured for payment according to Article 783.05. Temporary covering of existing pavement markings with blackout tape will be measured for payment in feet (meters) in place. Removal of blackout tape will be measured for payment in square feet (square meters)."

Revise Article 701.20(j) of the Standard Specifications to read:

"(j) Removal of existing pavement markings and raised reflective pavement markers will be paid for according to Article 783.06. Temporary covering of existing pavement markings with blackout tape will be paid for at the contract unit price per foot for PAVEMENT MARKING BLACKOUT TAPE, of the line width specified." Removal of blackout tape will be paid for as work zone pavement marking removal according to Article 703.07."

Revise the first two paragraphs of Article 1095.06 of the Standard Specifications to read:

"**1095.06 Pavement Marking Tape.** White or yellow marking tape shall consist of glass spheres of high optical quality embedded into a binder on a suitable backing that is precoated with a pressure sensitive adhesive. The spheres shall be of uniform gradation and distributed evenly over the surface of the tape. Blackout marking tape shall be a Type III tape consisting of a matte black, non-reflective, patterned surface that is precoated with a pressure sensitive adhesive. The surface of the blackout pavement marking tape shall provide a minimum skid resistance value of 45 BPN when tested according to ASTM E 303-74.

The material shall be white, yellow, or matte black as specified. White and yellow colors shall conform closely to Federal color tolerances for pavement marking paint."

Revise the second table of Article 1095.06 to read:

"Test	Type I		Type III		
	White	Yellow	White	Yellow	Blackout
Initial Thickness, mils (mm)	20 (0.51)	20 (0.51)	20 (0.51)	20 (0.51)	65 (1.65) 1/ 10 (0.25) 2/
Durability (cycles)	5,000	5,000	1,500	1,500	1,500

Notes:
1/ Measured at the thickest point of the patterned surface.
2/ Measured at the thinnest point of the patterned surface."

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 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 – CURING OF ABUTMENTS AND PIERS (BDE)
Effective: January 1, 2014

Revise Note 7/ of the Index Table of Curing and Protection of Concrete Construction of Article 1020.13 of the Standard Specifications to read:

"7/ Asphalt emulsion for waterproofing may be used in lieu of other curing methods when specified and permitted according to Article 503.18. The top surfaces of abutments and piers shall be cured according to Article 1020.13(a)(3) or (5)."

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."

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."

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).

RECLAIMED ASPHALT PAVEMENT AND RECLAIMED ASPHALT SHINGLES (BDE)
Effective: November 1, 2012
Revise: April 1, 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 produced by cold milling or crushing an existing hot-mix asphalt (HMA) pavement. 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 93 percent passing the #4 (4.75 mm) sieve based on a dry shake gradation. RAS shall be uniform in gradation and asphalt binder content and shall meet the testing requirements specified herein. In addition, RAS shall meet the following Type 1 or Type 2 requirements.

(1) Type 1. Type 1 RAS shall be processed, preconsumer asphalt shingles salvaged from the manufacture of residential asphalt roofing shingles.

(2) Type 2. Type 2 RAS shall be processed post-consumer shingles only, salvaged from residential, or four unit or less dwellings not subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP).

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

(a) RAP Stockpiles. The Contractor shall construct individual, sealed RAP stockpiles meeting one of the following definitions. No additional RAP shall be added to the pile after the pile has been sealed. Stockpiles shall be sufficiently separated to prevent intermingling at the base. Stockpiles shall be identified by signs indicating the type as listed below (i.e. “Homogeneous Surface”).

Prior to milling, the Contractor shall request the District provide documentation on the quality of the RAP to clarify the appropriate stockpile.

(1) Fractionated RAP (FRAP). FRAP shall consist of RAP from Class I, HMA (High and Low ESAL) 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 fractionated prior to testing by screening into a minimum of two size 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 shall pass the sieve size specified below for the mix into which the FRAP will be incorporated.

Mixture FRAP will be used in:	Sieve Size that 100% of FRAP Shall Pass
IL-25.0	2 in. (50 mm)
IL-19.0	1 1/2 in. (40 mm)
IL-12.5	1 in. (25 mm)
IL-9.5	3/4 in. (20 mm)
IL-4.75	1/2 in. (13 mm)

(2) Homogeneous. Homogeneous RAP stockpiles shall consist of RAP from Class I, HMA (High and Low ESAL) mixtures and represent: 1) the same aggregate quality, but shall be at least C quality; 2) the same type of crushed aggregate (either crushed natural aggregate, ACBF slag, or steel slag); 3) similar gradation; and 4) similar asphalt binder content. If approved by the Engineer, combined single pass surface/binder millings may be considered “homogenous” with a quality rating dictated by the lowest coarse aggregate quality present in the mixture.

(3) Conglomerate. Conglomerate RAP stockpiles shall consist of RAP from Class I, HMA (High and Low ESAL) 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 prior to testing by crushing to where all RAP shall pass the 5/8 in. (16 mm) or smaller screen. Conglomerate RAP stockpiles shall not contain steel slag.

(4) Conglomerate “D” Quality (DQ). Conglomerate DQ RAP stockpiles shall consist of RAP from Class I, HMA (High or Low ESAL), or ”All Other” (as defined by Article 1030.04(a)(3)) mixtures. 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.

(5) Non-Quality. RAP stockpiles that do not meet the requirements of the stockpile categories listed above shall be classified as “Non-Quality”.

RAP/FRAP containing contaminants, such as earth, brick, sand, concrete, sheet asphalt, bituminous surface treatment (i.e. chip seal), pavement fabric, joint sealants, 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 not be intermingled. Each stockpile shall be signed indicating what type of RAS is present.

Unless otherwise specified by the Engineer, mechanically blending manufactured sand (FM 20 or FM 22) up to an equal weight of RAS with the processed RAS will be permitted to improve workability. The sand shall be “B Quality” or better from an approved Aggregate Gradation Control System source. The sand shall be accounted for in the mix design and during HMA production.

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

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

(a) RAP/FRAP Testing. When used in HMA, the RAP/FRAP shall be sampled and tested either during or after stockpiling.

(1) During Stockpiling. For testing during stockpiling, washed extraction samples shall be run at the minimum frequency of one sample per 500 tons (450 metric tons) for the first 2000 tons (1800 metric tons) and one sample per 2000 tons (1800 metric tons) thereafter. A minimum of five tests shall be required for stockpiles less than 4000 tons (3600 metric tons).

(2) After Stockpiling. For testing after stockpiling, the Contractor shall submit a plan for approval to the District proposing a satisfactory method of sampling and testing the RAP/FRAP pile either in-situ or by 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.

Each sample shall be split to obtain two equal 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 or RAS blended with manufactured sand shall be sampled and tested during stockpiling according to Illinois Department of Transportation Policy Memorandum, “Reclaimed Asphalt Shingle (RAS) Source”.

Samples shall be collected during stockpiling 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 250 tons (225 metric tons) thereafter. A minimum of five samples are required for stockpiles less than 1000 tons (900 metric tons). Once a ≤ 1000 ton (900 metric ton), five-sample/test stockpile has been established it shall be sealed. Additional incoming RAS or RAS blended with manufactured sand shall be stockpiled in a separate working pile as designated in the Quality Control plan and only added to the sealed stockpile when the test results of the working pile are complete and are found to meet the tolerances specified herein for the original sealed RAS stockpile.

Before testing, each sample shall be split to obtain two test samples. One of the two test samples from the final split shall be labeled and stored for Department use. The Contractor shall perform a washed extraction and test for unacceptable materials on 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.

If the sampling and testing was performed at the shingle processing facility in accordance with the QC Plan, the Contractor shall obtain and make available all of the test results from start of the initial stockpile.

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

(a) Evaluation of RAP/FRAP Test Results. All of the extraction results shall be compiled and averaged for asphalt binder content and gradation and, when applicable G_{mm}. Individual extraction test results, when compared to the averages, will be accepted if within the tolerances listed below.

Parameter	FRAP/Homogeneous /Conglomerate	Conglomerate "D" Quality
1 in. (25 mm)		± 5 %
1/2 in. (12.5 mm)	± 8 %	± 15 %
No. 4 (4.75 mm)	± 6 %	± 13 %
No. 8 (2.36 mm)	± 5 %	
No. 16 (1.18 mm)		± 15 %
No. 30 (600 µm)	± 5 %	
No. 200 (75 µm)	± 2.0 %	± 4.0 %
Asphalt Binder	± 0.4 % 1/	± 0.5 %
G_{mm}	± 0.03	

1/ The tolerance for FRAP shall be ± 0.3 %.

If more than 20 percent of the individual sieves and/or asphalt binder content tests are out of the above tolerances, the RAP/FRAP shall not be used in HMA unless the RAP/FRAP representing the failing tests is removed from the stockpile. All test data and acceptance ranges shall be sent to the District for evaluation.

With the approval of the Engineer, the ignition oven may be substituted for extractions according to the Illinois Test Procedure, "Calibration of the Ignition Oven for the Purpose of Characterizing Reclaimed Asphalt Pavement (RAP)".

(b) Evaluation of RAS and RAS Blended with Manufactured Sand Test Results. All of the test results, with the exception of percent unacceptable materials, shall be compiled and averaged for asphalt binder content and gradation. Individual test results, when compared to the averages, will be accepted if within the tolerances listed below.

Parameter	RAS
No. 8 (2.36 mm)	± 5 %
No. 16 (1.18 mm)	± 5 %
No. 30 (600 µm)	± 4 %
No. 200 (75 µm)	± 2.0 %
Asphalt Binder Content	± 1.5 %

If more than 20 percent of the individual sieves and/or asphalt binder content tests are out of the above tolerances, or if the percent unacceptable material exceeds 0.5 percent by weight of material retained on the # 4 (4.75 mm) sieve, the RAS or RAS blend shall not be used in Department projects. All test data and acceptance ranges shall be sent to the District for evaluation.

1031.05 Quality Designation of Aggregate in RAP/FRAP.

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

(1) RAP from Class I, Superpave/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. Coarse and fine FRAP 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.

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

(a) RAP/FRAP. The use of RAP/FRAP in HMA shall be as follows.

(1) Coarse Aggregate Size. The coarse aggregate in all RAP shall be equal to or less than the nominal maximum size requirement for the HMA mixture to be produced.

(2) Steel Slag Stockpiles. Homogeneous RAP stockpiles containing steel slag will be approved for use in all HMA (High ESAL and Low ESAL) Surface and Binder Mixture applications.

(3) Use in HMA Surface Mixtures (High and Low ESAL). RAP/FRAP stockpiles for use in HMA surface mixtures (High and Low ESAL) shall be FRAP or homogeneous in which the coarse aggregate is Class B quality or better. RAP/FRAP from Conglomerate stockpiles shall be considered equivalent to limestone for frictional considerations. Known frictional contributions from plus #4 (4.75 mm) homogeneous RAP and FRAP stockpiles will be accounted for in meeting frictional requirements in the specified mixture.

(4) Use in HMA Binder Mixtures (High and Low ESAL), HMA Base Course, and HMA Base Course Widening. RAP/FRAP stockpiles for use in HMA binder mixtures (High and Low ESAL), HMA base course, and HMA base course widening shall be FRAP, homogeneous, or conglomerate, in which the coarse aggregate is Class C quality or better.

(5) Use in Shoulders and Subbase. RAP/FRAP stockpiles for use in HMA shoulders and stabilized subbase (HMA) shall be FRAP, homogeneous, conglomerate, or conglomerate DQ.

(6) When the Contractor chooses the RAP option, the percentage of RAP shall not exceed the amounts indicated in Article 1031.06(c)(1) below for a given N Design.

(b) RAS. RAS meeting Type 1 or Type 2 requirements will be permitted in all HMA applications as specified herein.

(c) RAP/FRAP and/or RAS Usage Limits. Type 1 or Type 2 RAS may be used alone or in conjunction with RAP or FRAP in HMA mixtures up to a maximum of 5.0% by weight of the total mix.

(1) RAP/RAS. When RAP is used alone or RAP is used in conjunction with RAS, the percentage of virgin asphalt binder replacement shall not exceed the amounts listed in the Max RAP/RAS ABR table listed below for the given Ndesign.

RAP/RAS Maximum Asphalt Binder Replacement (ABR) Percentage

HMA Mixtures 1/, 2/	RAP/RAS Maximum ABR %		
Ndesign	Binder/Leveling Binder	Surface	Polymer Modified
30	30	30	10
50	25	15	10
70	15	10	10
90	10	10	10
105	10	10	10

1/ For HMA “All Other” (shoulder and stabilized subbase) N-30, the RAP/RAS ABR shall not exceed 50 percent of the mixture.

2/ When RAP/RAS ABR exceeds 20 percent, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent ABR would require a virgin asphalt binder grade of PG64-22 to be reduced to a PG58-28). If warm mix asphalt (WMA) technology is utilized, and production temperatures do not exceed 275 °F (135 °C) the high and low virgin asphalt binder grades shall each be reduced by one grade when RAP/RAS ABR exceeds 25 percent (i.e. 26 percent RAP/RAS ABR would require a virgin asphalt binder grade of PG64-22 to be reduced to a PG58-28).

(2) FRAP/RAS. When FRAP is used alone or FRAP is used in conjunction with RAS, the percentage of virgin asphalt binder replacement shall not exceed the amounts listed in the FRAP/RAS table listed below for the given N design.

FRAP/RAS Maximum Asphalt Binder Replacement (ABR) Percentage

HMA Mixtures 1/, 2/	FRAP/RAS Maximum ABR %		
Ndesign	Binder/Leveling Binder	Surface	Polymer Modified 3/, 4/
30	50	40	10
50	40	35	10
70	40	30	10
90	40	30	10
105	40	30	10

1/ For HMA "All Other" (shoulder and stabilized subbase) N30, the FRAP/RAS ABR shall not exceed 50 percent of the mixture.

2/ When FRAP/RAS ABR exceeds 20 percent for all mixes the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent ABR would require a virgin asphalt binder grade of PG64-22 to be reduced to a PG58-28). If warm mix asphalt (WMA) technology is utilized, and production temperatures do not exceed 275 °F (135 °C) the high and low virgin asphalt binder grades shall each be reduced by one grade when FRAP/RAS ABR exceeds 25 percent (i.e. 26 percent ABR would require a virgin asphalt binder grade of PG64-22 to be reduced to a PG58-28).

3/ For SMA the FRAP/RAS ABR shall not exceed 20 percent.

4/ For IL-4.75 mix the FRAP/RAS ABR shall not exceed 30 percent.

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

(a) RAP/FRAP and/or RAS. RAP/FRAP and/or RAS mix designs shall be submitted for verification. If additional RAP/FRAP stockpiles are tested and found that no more than 20 percent of the results, as defined under "Testing" herein, are outside of the control tolerances set for the original RAP/FRAP stockpile and HMA mix design, and meets all of the requirements herein, the additional RAP/FRAP stockpiles may be used in the original mix 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 (Gsb) of 2.500 shall be used for mix design purposes.

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

(a) RAP/FRAP. The coarse aggregate in all RAP/FRAP used shall be equal to or less than the nominal maximum size requirement for the HMA mixture being produced.

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 RAP feed system to remove or reduce oversized material. If material passing the sizing device adversely affects the mix production or quality of the mix, the sizing device shall be set at a size specified by the Engineer.

If the RAP/FRAP control tolerances or QC/QA test results require corrective action, the Contractor shall cease production of the mixture containing RAP/FRAP and either switch to the virgin aggregate design or submit a new RAP/FRAP design.

(b) RAS. RAS shall be incorporated into the HMA mixture either by a separate weight depletion system or by using the RAP weigh belt. Either feed system shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes. The portion of RAS shall be controlled accurately to within ± 0.5 percent of the amount of RAS utilized. When using the weight depletion system, flow indicators or sensing devices shall be provided and interlocked with the plant controls such that the mixture production is halted when RAS flow is interrupted.

(c) RAP/FRAP and/or RAS. HMA plants utilizing RAP/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 RAP/FRAP/RAS 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 RAP/FRAP material as a percent of the total mix to the nearest 0.1 percent.

h. Aggregate and RAP/FRAP moisture compensators in percent as set on the control panel. (Required when accumulated or individual aggregate and RAP/FRAP are printed in wet condition.)

(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).

e. RAP/FRAP/RAS weight to the nearest pound (kilogram).

f. Virgin asphalt binder weight to the nearest pound (kilogram).

g. Residual asphalt binder in the RAP/FRAP/RAS 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 in aggregate surface course (temporary access entrances only) and aggregate wedge shoulders Type B 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. (37.5 mm) sieve. The RAP material shall be reasonably well graded from coarse to fine. RAP material that is gap-graded or single sized will not be accepted.”

RETROREFLECTIVE SHEETING FOR HIGHWAY SIGNS (BDE)
Effective: November 1, 2014

Revise the first sentence of the first paragraph of Article 1091.03(a)(3) of the Standard Specifications to read:

"When tested according to ASTM E 810, with averaging, the sheeting shall have a minimum coefficient of retroreflection as show in the following tables."

Replace the Tables for Type AA sheeting, Type AP sheeting, Type AZ sheeting and Type ZZ sheeting in Article 1091.03(a)(3) with the following.

Type AA Sheeting
Minimum Coefficient of Retroreflection
Candelas/foot candle/sq ft (candelas/lux/sq m) of material

Type AA (Average of 0 and 90 degree rotation)

Observation Angle (deg.)	Entrance Angle (deg.)	White	Yellow	Red	Green	Blue	FO
0.2	-4	800	600	120	80	40	200
0.2	+30	400	300	60	35	20	100
0.5	-4	200	150	30	20	10	75
0.5	+30	100	75	15	10	5	35

Type AA (45 degree rotation)

Observation Angle (deg.)	Entrance Angle (deg.)	Yellow	FO
0.2	-4	500	165
0.2	+30	115	40
0.5	-4	140	65
0.5	+30	60	30

Type AP Sheeting
Minimum Coefficient of Retroreflection
Candelas/foot candle/sq ft (candelas/lux/sq m) of material

Type AP (Average of 0 and 90 degree rotation)

Observation Angle (deg.)	Entrance Angle (deg.)	White	Yellow	Red	Green	Blue	Brown	FO
0.2	-4	500	380	75	55	35	25	150
0.2	+30	180	135	30	20	15	10	55
0.5	-4	300	225	50	30	20	15	90
0.5	+30	90	70	15	10	7.5	5	30

Type AZ Sheeting
Minimum Coefficient of Retroreflection
Candelas/foot candle/sq ft (candelas/lux/sq m) of material

Type AZ (Average of 0 and 90 degree rotation)

Observation Angle (deg.)	Entrance Angle (deg.)	White	Yellow	Red	Green	Blue	FYG	FY
0.2	-4	375	280	75	45	25	300	230
0.2	+30	235	170	40	25	15	190	150
0.5	-4	245	180	50	30	20	200	155
0.5	+30	135	100	25	15	10	100	75
1.0	-4	50	37.5	8.5	5	2	45	25
1.0	+30	22.5	20	5	3	1	25	12.5

Type ZZ Sheeting
Minimum Coefficient of Retroreflection
Candelas/foot candle/sq ft (candelas/lux/sq m) of material

Type ZZ (Average of 0 and 90 degree rotation)

Observation Angle (deg.)	Entrance Angle (deg.)	White	Yellow	Red	Green	Blue	FYG	FY	FO
0.2	-4	570	425	90	60	30	460	340	170
0.2	+30	190	140	35	20	10	150	110	65
0.5	-4	400	300	60	40	20	320	240	120
0.5	+30	130	95	20	15	7	100	80	45
1.0	-4	115	90	17	12	5	95	70	35
1.0	+30	45	35	7	5	2	35	25	15

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 or 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."

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 ±1/4 in. (±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."

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."

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)."

RIGID METAL CONDUIT (BDE)
Effective: August 1, 2014

Add the following to Article 1088.01(a) of the Standard Specifications:

"(6) Stainless Steel Conduit. The conduit shall be Type 304 or Type 316 stainless steel, shall be manufactured according to UL Standard 6A, and shall meet ANSI Standard C80.1. Conduit fittings shall be Type 304 or Type 316 stainless steel and shall be manufactured according to UL Standard 514B.

All conduit supports, straps, clamps. And other attachments shall be Type 304 or Type 316 stainless steel. Attachment hardware shall be stainless steel according to Article 1006.31."

TRACKING THE USE OF PESTICIDES (BDE)
Effective: August 1, 2012

Add the following paragraph after the first paragraph of Article 107.23 of the Standard Specifications:

"Within 48 hours of the application of pesticides, including but not limited to herbicides, insecticides, algaecides, and fungicides, the Contractor shall complete and return to the Engineer, Operations form "OPER 2720"."

WATERWAY OBSTRUCTION WARNING LUMINAIRE (BDE)
Effective: August 1, 2014

Revise the second paragraph of Article 1067.07(a) of the Standard Specifications to read:

"The luminaire shall have a bronze housing and shall meet the requirements set forth by the United States Coast Guard in Title 33, Part 118 of the Code of Federal Regulations. Nuts, bolts, thumb screws, hardware, thread rods, and mounting bases which are exterior, shall be stainless steel (300 series) or bronze. Hardware on the interior of the lamp cavity shall be stainless steel or bronze."

Add the following paragraphs after the third paragraph of Article 1067.01(a) of the Standard Specifications:

"The pivot type mounting assembly shall be bronze and shall be mounted on an external vibration isolator. The pivot assembly shall include a greased bearing with a grease fitting installed near the counterweight such that the bearing can be lubricated from the bridge deck. An aluminum or stainless steel extension tube shall run from the grease fitting to the bearing. A locking rod assembly made of aluminum or stainless steel shall secure the luminaire in operating position. Stainless steel pipes shall be used to attach the pivot assembly to both the luminaire housing and the counterweights. A stainless steel locknut shall be used at all threaded connections to the pipes.

Stainless steel hook, ring, and connecting plates shall be attached to the bridge railing with stainless steel hardware or shall be anchored in the parapet. The connecting plate shall include a vandal-resistant rod locking mechanism. The service chain shall be stainless steel."

Add the following to the end of the first paragraph of Article 1067.07(a)(3) of the Standard Specifications:

"Surge protection for the luminaire shall be integral to the fixture housing."

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 ± 2 percent of the actual water metered. The foaming control system shall be electronically interfaced with the asphalt binder meter.

b. Additives. Additives shall be introduced into the plant according to the supplier's recommendations and shall be approved by the Engineer. The system for introducing the WMA additive shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes."

Mix Design Verification.

Add the following to Article 1030.04 of the Standard Specifications.

"(e) Warm Mix Technologies.

(1) Foaming. WMA mix design verification will not be required when foaming technology is used alone (without WMA additives). However, the foaming technology shall only be used on HMA designs previously approved by the Department.

(2) Additives. WMA mix designs utilizing additives shall be submitted to the Engineer for mix design verification."

Construction Requirements.

Revise the second paragraph of Article 406.06(b)(1) of the Standard Specifications to read:

"The HMA shall be delivered at a temperature of 250 to 350 °F (120 to 175 °C). WMA shall be delivered at a minimum temperature of 215 °F (102 °C)."

Basis of Payment.

This work will be paid at the contract unit price bid for the HMA pay items involved. Anti-strip will not be paid for separately, but shall be considered as included in the cost of the work.

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.

BITUMINOUS MATERIALS COST ADJUSTMENTS (BDE) (RETURN FORM WITH BID)
Effective: November 2, 2006 Revised: August 1, 2013

Description. Bituminous material cost adjustments will be made to provide additional compensation to the Contractor, or credit to the Department, for fluctuations in the cost of bituminous materials when optioned by the Contractor. The adjustments shall apply to permanent and temporary hot-mix asphalt (HMA) mixtures, bituminous surface treatments (cover and seal coats), and preventative maintenance type surface treatments. The adjustments shall not apply to bituminous prime coats, tack coats, crack filling/sealing, or joint filling/sealing.

The bidder shall indicate on the attached form whether or not this special provision will be part of the contract and submit the completed form with his/her bid. Failure to submit the form, or failure to fill out the form completely, shall make this contract exempt of bituminous materials cost adjustments.

Method of Adjustment. Bituminous materials cost adjustments will be computed as follows.

$CA = (BPI_P - BPI_L) \times (\%AC_V / 100) \times Q$

Where: CA = Cost Adjustment, $.
BPI_P = Bituminous Price Index, as published by the Department for the month the work is performed, $/ton ($/metric ton).
BPI_L = Bituminous Price Index, as published by the Department for the month prior to the letting, $/ton ($/metric ton).
$\%AC_V$ = Percent of virgin Asphalt Cement in the Quantity being adjusted. For HMA mixtures, the % AC_V will be determined from the adjusted job mix formula. For bituminous materials applied, a performance graded or cutback asphalt will be considered to be 100% AC_V and undiluted emulsified asphalt will be considered to be 65% AC_V.
Q = Authorized construction Quantity, tons (metric tons) (see below).

For HMA mixtures measured in square yards: Q, tons = A x D x (G_{mb} x 46.8) / 2000. For HMA mixtures measured in square meters: Q, metric tons = A x D x (G_{mb} x 1) / 1000. When computing adjustments for full-depth HMA pavement, separate calculations will be made for the binder and surface courses to account for their different G_{mb} and % AC_V.

For bituminous materials measured in gallons: Q, tons = V x 8.33 lb/gal x SG / 2000
For bituminous materials measured in liters: Q, metric tons = V x 1.0 kg/L x SG / 1000

Where: A = Area of the HMA mixture, sq yd (sq m).
D = Depth of the HMA mixture, in. (mm).
G_{mb} = Average bulk specific gravity of the mixture, from the approved mix design.
V = Volume of the bituminous material, gal (L).
SG = Specific Gravity of bituminous material as shown on the bill of lading.

Basis of Payment. Bituminous materials cost adjustments may be positive or negative but will only be made when there is a difference between the BPI_L and BPI_P in excess of five percent, as calculated by:

$\text{Percent Difference} = \{(BPI_L - BPI_P) \div BPI_L\} \times 100$

Bituminous materials cost adjustments will be calculated for each calendar month in which applicable bituminous material is placed; and will be paid or deducted when all other contract requirements for the work placed during the month are satisfied. The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

Return With Bid

ILLINOIS DEPARTMENT OF TRANSPORTATION

OPTION FOR BITUMINOUS MATERIALS COST ADJUSTMENTS

The bidder shall submit this completed form with his/her bid. Failure to submit the form, or failure to fill out the form completely, shall make this contract exempt of bituminous materials cost adjustments. After award, this form, when submitted, shall become part of the contract.

Contract No.: _____

Company Name:_____

Contractor's Option:

Is your company opting to include this special provision as part of the contract?

Yes ☐ No ☐

Signature: _____ **Date:** _____

FUEL COST ADJUSTMENT (BDE) (RETURN FORM WITH BID)
Effective: April 1, 2009 Revised: July 1, 2009

Description. Fuel cost adjustments will be made to provide additional compensation to the Contractor, or a credit to the Department, for fluctuations in fuel prices when optioned by the Contractor. The bidder shall indicate on the attached form whether or not this special provision will be part of the contract and submit the completed form with his/her bid. Failure to submit the form or failure to indicate contract number, company name and sign and date the form shall make this contract exempt of fuel cost adjustments for all categories of work. Failure to indicate "Yes" for any category of work will make that category of work exempt from fuel cost adjustment.

General. The fuel cost adjustment shall apply to contract pay items as grouped by category. The adjustment shall only apply to those categories of work checked "Yes", and only when the cumulative plan quantities for a category exceed the required threshold. Adjustments to work items in a category, either up or down, and work added by adjusted unit price will be subject to fuel cost adjustment only when the category representing the added work was subject to the fuel cost adjustment. Added work paid for by time and materials will not be subject to fuel cost adjustment. Category descriptions and thresholds for application and the fuel usage factors which are applicable to each are as follows:

(a) Categories of Work.

(1) Category A: Earthwork. Contract pay items performed under Sections 202, 204, and 206 including any modified standard or nonstandard items where the character of the work to be performed is considered earthwork. The cumulative total of all applicable item plan quantities shall exceed 25,000 cu yd (20,000 cu m). Included in the fuel usage factor is a weighted average 0.10 gal/cu yd (0.50 liters/cu m) factor for trucking.

(2) Category B: Subbases and Aggregate Base Courses. Contract pay items constructed under Sections 311, 312 and 351 including any modified standard or nonstandard items where the character of the work to be performed is considered construction of a subbase or aggregate, stabilized or modified base course. The cumulative total of all applicable item plan quantities shall exceed 5000 tons (4500 metric tons). Included in the fuel usage factor is a 0.60 gal/ton (2.50 liters/metric ton) factor for trucking.

(3) Category C: Hot-Mix Asphalt (HMA) Bases, Pavements and Shoulders. Contract pay items constructed under Sections 355, 406, 407 and 482 including any modified standard or nonstandard items where the character of the work to be performed is considered HMA bases, pavements and shoulders. The cumulative total of all applicable item plan quantities shall exceed 5000 tons (4500 metric tons). Included in the fuel usage factor is 0.60 gal/ton (2.50 liters/metric ton) factor for trucking.

(4) Category D: Portland Cement Concrete (PCC) Bases, Pavements and Shoulders. Contract pay items constructed under Sections 353, 420, 421 and 483 including any modified standard or nonstandard items where the character of the work to be performed is considered PCC base, pavement or shoulder. The cumulative total of all applicable item plan quantities shall exceed 7500 sq yd (6000 sq m). Included in the fuel usage factor is 1.20 gal/cu yd (5.94 liters/cu m) factor for trucking.

(5) Category E: Structures. Structure items having a cumulative bid price that exceeds $250,000 for pay items constructed under Sections 502, 503, 504, 505, 512, 516 and 540 including any modified standard or nonstandard items where the character of the work to be performed is considered structure work when similar to that performed under these sections and not included in categories A through D.

(b) Fuel Usage Factors.

English Units

Category	Factor	Units
A - Earthwork	0.34	gal / cu yd
B – Subbase and Aggregate Base courses	0.62	gal / ton
C – HMA Bases, Pavements and Shoulders	1.05	gal / ton
D – PCC Bases, Pavements and Shoulders	2.53	gal / cu yd
E – Structures	8.00	gal / $1000

Metric Units

Category	Factor	Units
A - Earthwork	1.68	liters / cu m
B – Subbase and Aggregate Base courses	2.58	liters / metric ton
C – HMA Bases, Pavements and Shoulders	4.37	liters / metric ton
D – PCC Bases, Pavements and Shoulders	12.52	liters / cu m
E – Structures	30.28	liters / $1000

(c) Quantity Conversion Factors.

Category	Conversion	Factor
B	sq yd to ton	0.057 ton / sq yd / in depth
	sq m to metric ton	0.00243 metric ton / sq m / mm depth
C	sq yd to ton	0.056 ton / sq yd / in depth
	sq m to metric ton	0.00239 m ton / sq m / mm depth
D	sq yd to cu yd	0.028 cu yd / sq yd / in depth
	sq m to cu m	0.001 cu m / sq m / mm depth

Method of Adjustment. Fuel cost adjustments will be computed as follows.

$CA = (FPI_P - FPI_L) \times FUF \times Q$

Where: CA = Cost Adjustment, $
FPI_P = Fuel Price Index, as published by the Department for the month the work is performed, $/gal ($/liter)
FPI_L = Fuel Price Index, as published by the Department for the month prior to the letting, $/gal ($/liter)
FUF = Fuel Usage Factor in the pay item(s) being adjusted
Q = Authorized construction Quantity, tons (metric tons) or cu yd (cu m)

The entire FUF indicated in paragraph (b) will be used regardless of use of trucking to perform the work.

Progress Payments. Fuel cost adjustments will be calculated for each calendar month in which applicable work is performed; and will be paid or deducted when all other contract requirements for the items of work are satisfied. The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

Final Quantities. Upon completion of the work and determination of final pay quantities, an adjustment will be prepared to reconcile any differences between estimated quantities previously paid and the final quantities. The value for the balancing adjustment will be based on a weighted average of FPI_P and Q only for those months requiring the cost adjustment. The cost adjustment will be applicable to the final measured quantities of all applicable pay items.

Basis of Payment. Fuel cost adjustments may be positive or negative but will only be made when there is a difference between the FPI_L and FPI_P in excess of five percent, as calculated by:

Percent Difference = $\{(FPI_L - FPI_P) \div FPI_L\} \times 100$

Return With Bid

ILLINOIS DEPARTMENT OF TRANSPORTATION

OPTION FOR FUEL COST ADJUSTMENT

The bidder shall submit this completed form with his/her bid. Failure to submit the form or properly complete contract number, company name, and sign and date the form shall make this contract exempt of fuel cost adjustments in all categories. Failure to indicate "Yes" for any category of work at the time of bid will make that category of work exempt from fuel cost adjustment. After award, this form, when submitted shall become part of the contract.

Contract No.: _____

Company Name:_____

Contractor's Option:

Is your company opting to include this special provision as part of the contract plans for the following categories of work?

Category A Earthwork.	Yes	☐
Category B Subbases and Aggregate Base Courses	Yes	☐
Category C HMA Bases, Pavements and Shoulders	Yes	☐
Category D PCC Bases, Pavements and Shoulders	Yes	☐
Category E Structures	Yes	☐

Signature: _____ **Date:** _____

STEEL COST ADJUSTMENT (BDE) (RETURN FORM WITH BID)
Effective: April 2, 2004 Revised: April 1, 2009

Description. Steel cost adjustments will be made to provide additional compensation to the Contractor, or a credit to the Department, for fluctuations in steel prices when optioned by the Contractor. The bidder shall indicate on the attached form whether or not this special provision will be part of the contract and submit the completed form with his/her bid. Failure to submit the form or failure to indicate contract number, company name, and sign and date the form shall make this contract exempt of steel cost adjustments for all items of steel. Failure to indicate "Yes" for any item of work will make that item of steel exempt from steel cost adjustment.

Types of Steel Products. An adjustment will be made for fluctuations in the cost of steel used in the manufacture of the following items:

Metal Piling (excluding temporary sheet piling)
Structural Steel
Reinforcing Steel

Other steel materials such as dowel bars, tie bars, mesh reinforcement, guardrail, steel traffic signal and light poles, towers and mast arms, metal railings (excluding wire fence), and frames and grates will be subject to a steel cost adjustment when the pay items they are used in has a contract value of $10,000 or greater.

Documentation. Sufficient documentation shall be furnished to the Engineer to verify the following:

(a) The dates and quantity of steel, in lb (kg), shipped from the mill to the fabricator.

(b) The quantity of steel, in lb (kg), incorporated into the various items of work covered by this special provision. The Department reserves the right to verify submitted quantities.

Method of Adjustment. Steel cost adjustments will be computed as follows:

SCA = Q X D

Where: SCA = steel cost adjustment, in dollars
Q = quantity of steel incorporated into the work, in lb (kg)
D = price factor, in dollars per lb (kg)

$D = MPI_M - MPI_L$

Where: MPI_M = The Materials Cost Index for steel as published by the Engineering News-Record for the month the steel is shipped from the mill. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

MPI_L = The Materials Cost Index for steel as published by the Engineering News-Record for the month prior to the letting. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

The unit weights (masses) of steel that will be used to calculate the steel cost adjustment for the various items are shown in the attached table.

No steel cost adjustment will be made for any products manufactured from steel having a mill shipping date prior to the letting date.

If the Contractor fails to provide the required documentation, the method of adjustment will be calculated as described above; however, the MPI_M will be based on the date the steel arrives at the job site. In this case, an adjustment will only be made when there is a decrease in steel costs.

Basis of Payment. Steel cost adjustments may be positive or negative but will only be made when there is a difference between the MPI_L and MPI_M in excess of five percent, as calculated by:

Percent Difference = $\{(MPI_L - MPI_M) \div MPI_L\} \times 100$

Steel cost adjustments will be calculated by the Engineer and will be paid or deducted when all other contract requirements for the items of work are satisfied. Adjustments will only be made for fluctuations in the cost of the steel as described herein. No adjustment will be made for changes in the cost of manufacturing, fabrication, shipping, storage, etc.

The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

Attachment

Item	Unit Mass (Weight)
Metal Piling (excluding temporary sheet piling)	
Furnishing Metal Pile Shells 12 in. (305 mm), 0.179 in. (3.80 mm) wall thickness)	23 lb/ft (34 kg/m)
Furnishing Metal Pile Shells 12 in. (305 mm), 0.250 in. (6.35 mm) wall thickness)	32 lb/ft (48 kg/m)
Furnishing Metal Pile Shells 14 in. (356 mm), 0.250 in. (6.35 mm) wall thickness)	37 lb/ft (55 kg/m)
Other piling	See plans
Structural Steel	See plans for weights (masses)
Reinforcing Steel	See plans for weights (masses)
Dowel Bars and Tie Bars	6 lb (3 kg) each
Mesh Reinforcement	63 lb/100 sq ft (310 kg/sq m)
Guardrail	
Steel Plate Beam Guardrail, Type A w/steel posts	20 lb/ft (30 kg/m)
Steel Plate Beam Guardrail, Type B w/steel posts	30 lb/ft (45 kg/m)
Steel Plate Beam Guardrail, Types A and B w/wood posts	8 lb/ft (12 kg/m)
Steel Plate Beam Guardrail, Type 2	305 lb (140 kg) each
Steel Plate Beam Guardrail, Type 6	1260 lb (570 kg) each
Traffic Barrier Terminal, Type 1 Special (Tangent)	730 lb (330 kg) each
Traffic Barrier Terminal, Type 1 Special (Flared)	410 lb (185 kg) each
Steel Traffic Signal and Light Poles, Towers and Mast Arms	
Traffic Signal Post	11 lb/ft (16 kg/m)
Light Pole, Tenon Mount and Twin Mount, 30 - 40 ft (9 – 12 m)	14 lb/ft (21 kg/m)
Light Pole, Tenon Mount and Twin Mount, 45 - 55 ft (13.5 – 16.5 m)	21 lb/ft (31 kg/m)
Light Pole w/Mast Arm, 30 - 50 ft (9 – 15.2 m)	13 lb/ft (19 kg/m)
Light Pole w/Mast Arm, 55 - 60 ft (16.5 – 18 m)	19 lb/ft (28 kg/m)
Light Tower w/Luminaire Mount, 80 - 110 ft (24 – 33.5 m)	31 lb/ft (46 kg/m)
Light Tower w/Luminaire Mount, 120 - 140 ft (36.5 – 42.5 m)	65 lb/ft (97 kg/m)
Light Tower w/Luminaire Mount, 150 - 160 ft (45.5 – 48.5 m)	80 lb/ft (119 kg/m)
Metal Railings (excluding wire fence)	
Steel Railing, Type SM	64 lb/ft (95 kg/m)
Steel Railing, Type S-1	39 lb/ft (58 kg/m)
Steel Railing, Type T-1	53 lb/ft (79 kg/m)
Steel Bridge Rail	52 lb/ft (77 kg/m)
Frames and Grates	
Frame	250 lb (115 kg)
Lids and Grates	150 lb (70 kg)

Return With Bid

ILLINOIS DEPARTMENT OF TRANSPORTATION

OPTION FOR STEEL COST ADJUSTMENT

The bidder shall submit this completed form with his/her bid. Failure to submit the form or properly complete contract number, company name, and sign and date the form shall make this contract exempt of steel cost adjustments for all items of steel. Failure to indicate "Yes" for any item of work will make that item of steel exempt from steel cost adjustment. After award, this form, when submitted shall become part of the contract.

Contract No.: _____

Company Name:_____

Contractor's Option:

Is your company opting to include this special provision as part of the contract plans for the following items of work?

Metal Piling	Yes	☐
Structural Steel	Yes	☐
Reinforcing Steel	Yes	☐
Dowel Bars, Tie Bars and Mesh Reinforcement	Yes	☐
Guardrail	Yes	☐
Steel Traffic Signal and Light Poles, Towers and Mast Arms	Yes	☐
Metal Railings (excluding wire fence)	Yes	☐
Frames and Grates	Yes	☐

Signature: _____ **Date:** _____

MENTOR-PROTÉGÉ PROGRAM (BDE)
Effective: June 1, 2007
Revised: February 1, 2013

Eligibility. This contract is eligible for the Department's Mentor-Protégé Program for those bidders with an approved Mentor-Protégé Development Plan.

In order for a Mentor-Protégé relationship to be recognized as part of this contract, the Protégé shall be used as a subcontractor and a Mentor-Protégé Agreement for Contract Assistance and Training shall be fully executed and approved. The Mentor-Protégé Agreement for Contract Assistance and Training shall be completed on the form provided by the Department and submitted with the DBE Utilization Plan for approval by the Department. If approved, the Mentor-Protégé Agreement for Contract Assistance and Training shall become part of the contract. In the event the Mentor-Protégé Agreement for Contract Assistance and Training is not approved, the contract shall be performed in accordance with the DBE Utilization Plan exclusive of the Agreement.

DBE Goal Reduction. The DBE participation goal set for this contract may, at the discretion of the Department, be reduced according to the Mentor-Protégé Program Guidelines when the Protégé is used as a subcontractor. When submitting the DBE Utilization Plan, the bidder shall indicate whether the Protégé will be used as a subcontractor and to what extent.

Quarterly Reports. The Mentor shall submit quarterly progress reports as outlined in the Mentor-Protégé Program Implementation document. The reports shall indicate the progress toward each of the Plan's stated goals. The reports shall be signed by an authorized principal of each firm and submitted to the Engineer of Construction.

Failure to timely submit reports, or submission of incomplete reports may result in dissolution of relationship.

Reimbursement of Mentor Expenses. The direct and indirect expenses of the Mentor, as detailed in the approved Mentor-Protégé Agreement for Contract Assistance and Training will be reimbursed by the Department.

404 PERMIT

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

October 16, 2014

Operations, Readiness
and Regulatory Division
Regulatory Branch
Project Number: MVS-2013-631 (P-2854)

Roger Driskell
Illinois Department of Transportation, Region 6
126 East Ash Street
Springfield, Illinois, 62704

Dear Applicants:

Transmitted herewith is Department of the Army Permit No. P-2854, which authorizes the discharge of fill material into jurisdictional waters of the United States. The proposed project is a bridge replacement project to replace the bridge that spans the Illinois River in Meredosia, Illinois. The project involves removing and replacing the existing bridge at Meredosia carrying Illinois Route 104 over the Illinois River in Morgan County. A new structure will be built approximately 256 feet north (upstream) from the existing bridge.

The project site is located at Meredosia, in Pike and Morgan Counties, Illinois. The proposed work would occur on both sides, and over, the Illinois River in Section 6, Township 3 South, Range 1 West.

It is to be understood that this instrument does not give any property rights either in real estate or material, or any exclusive privileges; and that it does not authorize any injury to private property or invasion of private rights, or any infringement of Federal, state or local laws or regulations; nor does it obviate the necessity of obtaining state assent to the work authorized.

General conditions designated 1 through 6 and parts 2 through 6 of "Further Information" are standard conditions for all permits. The special conditions on page 4 specify measures to ensure protection of the aquatic environment and permit compliance.

If any material changes in the scope, location and plans of the work are found necessary, due to unforeseen conditions or otherwise, revised plans detailing proposed modifications in the work must be submitted to the District Engineer for review and approval.

Proposed modifications may not be placed under construction until Department of the Army "Approval of Revised Plans" has been granted.

Sincerely,

Danny D. McClendon

Danny D. McClendon
Chief, Regulatory Branch

Copies Furnished By Electronic Mail: (w/Special Conditions only)

IEPA – Gove
FWS – Mangan
IDNR – Diedrichsen

DEPARTMENT OF THE ARMY PERMIT

IDOT - Meredosia Bridge Replacement

Permit No. P-2854

Issuing Office U.S. Army Engineer District, St. Louis

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: The Illinois Department of Transportation proposes to replace the bridge that spans the Illinois River in Meredosia, Illinois. The project involves removing and replacing the existing bridge at Meredosia carrying Illinois Route 104 over the Illinois River in Morgan County. A new structure will be built approximately 256 feet north (upstream) from the existing bridge. Once the new structure is built, the old structure will be removed in accordance with an approved removal plan reviewed by the U.S. Army Corps of Engineers, the United States Coast Guard, and River Industry Action Committee (RIAC). The purpose of the project is to provide transportation facility across the Illinois River that is reliable and meets current design standards.

Project Location: The proposed project site is located at Meredosia, in Pike and Morgan Counties, Illinois. The proposed work would occur on both sides, and over, the Illinois River in Section 6, Township 3 South, Range 1 West.

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2019. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions: See continuation sheet, page 4 of this document.

ENG FORM 1721, Nov 86 EDITION OF SEP 82 IS OBSOLETE (33 CFR 325 (Appendix A))

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

(X) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorization required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a revaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision. Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Roger L. Driskell SAM 7/28/2014
(PERMITTEE) (DATE)

Roger Driskell
Illinois Department of Transportation, Region 6
126 East Ash Street
Springfield, Illinois, 62704

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Danny D. McClendon 10/16/14
(DISTRICT ENGINEER) Anthony P. Mitchell (DATE)
Colonel, U.S. Army
BY: Danny D. McClendon
Chief, Regulatory Branch

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) (DATE)

SPECIAL CONDITIONS FOR P-2854

1. The permittee must provide compensatory mitigation to offset unavoidable impacts to jurisdictional waters of the United States by purchasing 5.49 credits from LaGrange Wetland Mitigation Bank approved in the St. Louis District.

2. Failure to secure these credits from the location, in the amounts, and within the timeframe listed above may subject you to Corps Enforcement Regulations at 33 CFR 326.

3. The permittee agrees to incorporate water quality certification guidelines supplied by the Illinois Environmental Protection Agency and incorporated them as special conditions into this permit.

4. This permit does not obviate the permittee from obtaining any other federal, state or local authorization required by law for the activity authorized.

5. Representatives of the U.S. Army Corps of Engineers shall be permitted to inspect the project during the construction phase, and to collect any samples, or to conduct any tests deemed necessary. Further, The Corps of Engineers shall remain as the immediate point of contact. The Corps of Engineers shall be allowed to inspect this project at irregular intervals to assure that conditions of this permit are in compliance. The failure to comply with permit conditions will result in enforcement actions by the Corps of Engineers.

6. The permittee shall submit any revisions to the engineering plans for the authorized project to the St. Louis District for approval prior to implementing such revisions.

7. The permittee will monitor bank stability and apply for corrective measures as necessary.

8. The permittee understands and agrees that, if future operation by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure of work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

9. The permitted activities shall not prohibit or interfere with future work, construction of weirs, or dikes, undertaken by the United States Government for navigation purposes, nor shall the United States Government be held liable for any changed conditions resulting from the installation of weirs, dikes, revetment, etc.

10. The permittee shall comply with all lightings or other conditions required by the United States Coast Guard to mark the permitted structures. The United States Coast Guard, Marine Safety Office, can be contacted at 1222 Spruce Street, St. Louis, Missouri 63103-2832 for further information.

11. During authorized activities, you shall comply with all U.S. Coast Guard and Corps of Engineers regulations concerning the prevention of navigation obstructions in navigable waters of the United States. You shall conduct operations in the river such that there will be no unreasonable interference with navigation.

12. If any part of the authorized work is performed by a contractor, before starting work you shall discuss the terms and conditions of this permit with the contractor; and, you shall give a copy of this entire permit to the contractor.

13. You shall store all construction materials, equipment, and/or petroleum products, when not in use, above anticipated high water levels. You shall employ measures to prevent or control spilled fuels or lubricants from entering the waters of the United States.

14. That the permittee contact the St. Louis District Regulatory Branch at the beginning of construction and at the end of all construction.

15. The permittee shall develop a contingency plan for the prevention and control of spills of fuels, oils, or other hazardous materials. This plan shall be maintained on board the barge at all times. All barge personnel shall be familiar with the plan.

16. In the event any item(s) are encountered that could be historically significant, the permittee shall remove the barge from that specific location and contact the State Historic Preservation Office.

17. This permit does not obviate the permittee from obtaining any other federal, state or local authorization required by law for the activity authorized.

NOTIFICATION OF APPEAL PROCESS (NAP) FACT SHEET AND REQUEST FOR APPEAL (RFA) FORM

Applicant: Illinois Department of Transportation, Region 6, Attn: Roger Driskell	File Number: MVS-2013-631 (P-2854)	Date: October 16, 2014
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
X	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
X	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
DEPARTMENT OF THE ARMY ST. LOUIS DISTRICT CORPS OF ENGINEERS Attn: Alan Edmondson 1222 SPRUCE STREET ST. LOUIS, MISSOURI 63103-2833	Administrative Appeals Officer CEMVD-PD-KM (Mississippi Valley Division) P.O. Box 80 (1400 Walnut Street) Vicksburg, MS 39181-0080 Phone: (601) 634-5821

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217)782-2829
PAT QUINN, GOVERNOR LISA BONNETT, DIRECTOR

217/782-3362

JUL 2 8 2014

U.S. Army Corps of Engineers, St. Louis District
ATTN: Regulatory Branch
1222 Spruce Street
St. Louis, MO 63103-2833

Re: Illinois Department of Transportation, District 6 (Morgan County)
Ill. Route 104 Illinois River Bridge Replacement - Meredosia
Log # C-0191-11 [CoE appl. # MVS-2013-631]

Gentlemen:

This Agency received a request on September 30, 2013 from Illinois Department of Transportation, District 6 requesting necessary comments concerning the proposed replacement of the IL Route 104 bridge over the Illinois River and construction of related structures near Meredosia. We offer the following comments.

Based on the information included in this submittal, it is our engineering judgment that the proposed project may be completed without causing water pollution as defined in the Illinois Environmental Protection Act, provided the project is carefully planned and supervised.

These comments are directed at the effect on water quality of the construction procedures involved in the above described project and are not an approval of any discharge resulting from the completed facility, nor an approval of the design of the facility. These comments do not supplant any permit responsibilities of the applicant toward the Agency.

This Agency hereby issues certification under Section 401 of the Clean Water Act (PL 95-217), subject to the applicant's compliance with the following conditions:

1. The applicant shall not cause:

   a. violation of applicable water quality standards of the Illinois Pollution Control Board, Title 35, Subtitle C: Water Pollution Rules and Regulations;

   b. water pollution defined and prohibited by the Illinois Environmental Protection Act;

   c. interference with water use practices near public recreation areas or water supply intakes; or

   d. violation of applicable provisions of the Illinois Environmental Protection Act.

4302 N. Main St., Rockford, IL 61103 (815)987-7760
595 S. State, Elgin, IL 60123 (847)608-3131
2125 S. First St., Champaign, IL 61820 (217)278-5800
2009 Mall St., Collinsville, IL 62234 (618)346-5120
9511 Harrison St., Des Plaines, IL 60016 (847)294-4000
5407 N. University St., Arbor 113, Peoria, IL 61614 (309)693-5462
2309 W. Main St., Suite 116, Marion, IL 62959 (618)993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601 (312)814-6026

2. The applicant shall provide adequate planning and supervision during the project construction period for implementing construction methods, processes and cleanup procedures necessary to prevent water pollution and control erosion.

3. Any spoil material excavated, dredged or otherwise produced must not be returned to the waterway but must be deposited in a self-contained area in compliance with all state statutes, regulations and permit requirements with no discharge to waters of the State unless a permit has been issued by this Agency. Any backfilling must be done with clean material and placed in a manner to prevent violation of applicable water quality standards.

4. All areas affected by construction shall be mulched and seeded as soon after construction as possible. The applicant shall undertake necessary measures and procedures to reduce erosion during construction. Interim measures to prevent erosion during construction shall be taken and may include the installation of staked straw bales, sedimentation basins and temporary mulching. All construction within the waterway shall be constructed during zero or low flow conditions. The applicant shall be responsible for obtaining an NPDES Storm Water Permit prior to initiating construction if the construction activity associated with the project will result in the disturbance of 1 (one) 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.

5. The applicant shall implement erosion control measures consistent with the "Illinois Urban Manual" (IEPA/USDA, NRCS; 2013).

6. Asphalt, bituminous material and concrete with protruding material such as reinforcing bar or mesh shall not be 1) used for backfill, 2) placed on shorelines/streambanks, or 3) placed in waters of the State.

7. The proposed work shall be constructed with adequate erosion control measures (i.e., silt fences, straw bales, etc.) to prevent transport of sediment and material downstream.

8. The fill material used for temporary work areas in waters of the State shall be predominantly sand or larger size material, with <20% passing a #230 U. S. sieve.

9. The wetland mitigation plan received by the Agency on April 28, 2011 within the document titled "Environmental Assessment", page 37 and updated via email dated April 22, 2014 shall be implemented. Modifications to the wetland mitigation plan must be submitted to the Agency for approval. The permittee shall submit annual reports by July 1 of each calendar year on the status of the mitigation. The first annual report shall include a hydric soils determination that represents the soils at the completion of initial construction for the wetland mitigation site(s). The permittee shall monitor the mitigation for 5 years after the completion of initial construction. A final report shall be submitted within 90 days after completion of a 5-year monitoring period. Each annual report and the final report shall include the following: IEPA Log No., date of completion of initial construction, representative photographs, floristic quality index, updated topographic maps, description of work in the past year, the performance standards for the mitigation as stated in the mitigation

plan, and the activities remaining to complete the mitigation plan. For wetland mitigation sites containing non-hydric soils at the time of initial construction, the final report shall include a hydric soils determination that represents the soils at the end of the 5-year monitoring period. For wetland mitigation provided by purchase of wetland mitigation banking credits, in lieu of the above monitoring and reporting, the permittee shall submit written proof from the wetland mitigation bank that the wetland credits have been purchased within thirty (30) days of said purchase. The subject reports and proof of purchase of mitigation credits shall be submitted to:

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control
Permits Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

10. The applicant is advised that the following permit(s) must be obtained from the Agency: the applicant must obtain permits to construct sanitary sewers, water mains and related facilities prior to construction.

This certification becomes effective when the Department of the Army, Corps of Engineers, includes the above conditions # 1 through # 10 as conditions of the requested permit issued pursuant to Section 404 of PL 95-217.

This certification does not grant immunity from any enforcement action found necessary by this Agency to meet its responsibilities in prevention, abatement, and control of water pollution.

Sincerely,

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:DLH:DRG:C-0191-11_401 WQ Certification_30Sep13.docx

cc: IEPA, Records Unit
IEPA, DWPC, FOS, Springfield
IDNR, OWR, Springfield
USEPA, Region 5
Illinois Department of Transportation, District 6, 126 East Ash, Springfield, Illinois 62704
DRG

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

October 10, 2014

Readiness Branch

Permit OD-R 13-030, Meredosia Bridge (IL 104), Meredosia, Illinois

Mr. Jeff Myers, P.E.
Illinois Department of Transportation
126 East Ash
Springfield, Illinois 62704-4792

Dear Mr. Myers,

The St. Louis District has reviewed the submitted plan for the proposed new bridge crossing the Illinois River in Meredosia, Illinois, on Illinois 104. The bridge piers will be placed in the existing embankment. However, the net levee section centerline will be shifted to the west maintaining the level of protection. The work has been reviewed under requirements in 33 USC Section 408 (section 408 alteration) with policy in affect in November, 2013. Note that no alteration permit is required for work on the approach ramp in Meredosia since there is no federal flood risk management project impacted.

This permit is approved as submitted subject to the following:

1. The St. Louis District shall be notified 72 hours prior to beginning construction and retains the authority to have the Contractor cease operations if the river stages threaten the project.
2. Embankment compaction specifications shall be required for materials placed landside of the existing levee out to approximate station 58+50 and below the current top of levee elevation (approximately 453.5). Additionally, these same embankment requirements shall be used where there are any degradations or excavations into the existing levee (demolition).
3. The new embankment work landside of the western approach shall be brought up to the existing levee level of protection prior to beginning any excavation or pier construction on the riverside of the levee.
4. Any changes from the approved plan should be submitted to the St. Louis District for approval.
5. Long-term maintenance beneath the bridge deck from potential erosion will need to be addressed with the Levee District.

A permit under Section 404 of the Clean Water Act issued by the St. Louis District Corps of Engineers will be sent under separate cover to the applicant.

If you have any questions regarding this action, please contact me at (314)-331-8569 or Matthew Hunn at (314)346-9563 / Matthew.Hunn@us.army.mil .

Sincerely,

HUNN.MATTHEW.JOHN.1142991019

Digitally signed by HUNN.MATTHEW.JOHN.1142991019
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OSD, cn=HUNN.MATTHEW.JOHN.1142991019
Date: 2014.10.10 13:56:01 -05'00'

FOR Jake Scanlon
Chief, Readiness Branch

US Army Corps of Engineers
St. Louis District

This notice of authorization must be conspicuously displayed at the site of work.

October 16, 2014

Department of the Army Permit No. P-2854, authorizing the permittee the discharge of fill material into jurisdictional waters of the United States. The proposed project is a bridge replacement project to replace the bridge that spans the Illinois River in Meredosia, Illinois. The project involves removing and replacing the existing bridge at Meredosia carrying Illinois Route 104 over the Illinois River in Morgan County. A new structure will be built approximately 256 feet north (upstream) from the existing bridge.

The project site is located at Meredosia, in Pike and Morgan Counties, Illinois. The proposed work would occur on both sides, and over, the Illinois River in Section 6, Township 3 South, Range 1 West.

Name of Permittee: Illinois Department of Transportation, Region 6, Attn: Dennis O'Connell,

Address of Permittee: 126 East Ash Street, Springfield, Illinois, 62704

Permit Number

P -2854

Danny D. McClendon 10/16/14

Anthony P. Mitchell (DATE)
Colonel, U.S. Army
BY: Danny D. McClendon
Chief, Regulatory Branch

ENG FORM 4336, Jul 81 (33 CFR 320-220) EDITION OF JUL 70 MAY BE USED (PROPONENT: CECW-O)

COAST GUARD PERMIT

U.S. Department of Homeland Security
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street, Room 2.102D
St. Louis, MO 63103-2832
Staff Symbol: dwb
Phone: (314)269-2382
Fax: (314)269-2737
Email: david.a.orzechowski@uscg.mil
www.uscg.mil/d8/westernriversbridges

16591.1/71.3 ILW
October 9, 2014

CERTIFIED RECEIPT REQUESTED – CERTIFIED MAIL

Mr. Roger L. Driskell, P.E.
Deputy Director of Highways
Region Four Engineer
Illinois Department of Transportation
126 East Ash Street
Springfield, IL 62704-4792

Subj: MEREDOSIA BRIDGE, MILE 71.3, ILLINOIS WATERWAY

Dear Mr. Driskell:

Your application requesting approval of the location and plans for a proposed bridge at mile 71.3 over the Illinois Waterway has been approved. Bridge Permit (5-14-8) dated October 6, 2014 is enclosed.

It is essential that we be kept informed of any events that could affect navigation during construction of the bridge. A representative from your office should be specifically instructed to keep our office informed of the progress of construction with particular reference to any and all events that may have an effect on navigation. The information received regarding the work will be disseminated to mariners by radio and written notices.

Your attention is directed to Condition (2) of the permit that requires plans for cofferdams, temporary causeways, or any other temporary structures that will be placed in the water to facilitate construction of the pier protection cells to be approved by this office. Construction of the pier protection cells must be accomplished with minimal interference to navigation. To this end, construction schedules, plans and erection schemes should be submitted to us at the earliest possible time so that approval can be assured prior to commencing work.

Navigation lights and retro-reflective panels for the bridge are prescribed in enclosure (2a). The lights and reflective panels, prescribed in accordance with Title 33, Code of Federal Regulations, Part 118, shall be installed at the locations and in the manner shown in enclosure (2b), which is a marked-up copy of the permit drawings.

You are required by Condition (5) of the Permit to install vertical clearance gauges. The gauges shall be installed as prescribed in enclosure (3) which is a copy of Coast Guard instructions for installing vertical clearance gauges on bridges.

Subj: MEREDOSIA BRIDGE, MILE 71.3,
ILLINOIS WATERWAY

16591.1/71.3 ILW
October 9, 2014

Please acknowledge receipt of the Permit. If you have any questions concerning our jurisdiction or requirements, you can contact David Orzechowski at 314-269-2382.

Sincerely,

ERIC A. WASHBURN
Bridge Administrator, Western Rivers
By direction of the District Commander

Enclosures: (1) USCG Bridge Permit (5-14-8), dtd October 6, 2014 w/approved dwgs
(2) a. Navigation Lights Narrative
b. Navigation Lighting Scheme
(3) Vertical Clearance Gauge Requirement

Copy: CDRUSAED St. Louis w/o encls
USCGC SANGAMON w/o encls
SECTOR UMR w/o encls
MSD Quad Cities

U.S. Department of Homeland Security
United States Coast Guard

BRIDGE PERMIT

(5-14-8)

06 OCT 2014

WHEREAS by Title V of an act of Congress approved August 2, 1946, entitled "General Bridge Act of 1946," as amended (33 U.S.C. 525-533), the consent of Congress was granted for the construction, maintenance and operation of bridges and approaches thereto over the navigable waters of the United States;

AND WHEREAS the Secretary of Homeland Security has delegated the authority of Section 502(b) of that act to the Commandant, U.S. Coast Guard by Department of Homeland Security Delegation Number: 0170.1;

AND WHEREAS before construction is commenced, the Commandant must approve the location and plans of any such bridge and may impose any specific conditions relating to the construction, maintenance and operation of the structure deemed necessary in the interest of public navigation, such conditions to have the force of law;

AND WHEREAS the **- STATE OF ILLINOIS -** has submitted for approval the location and plans of a bridge to be constructed across the Illinois Waterway at Meredosia, Morgan and Pike Counties, Illinois;

NOW THEREFORE, This is to certify that the location and plans dated 30 October 2013 are hereby approved by the Commandant, subject to the following conditions:

1. No deviation from the approved plans may be made either before or after completion of the structure unless the modification of said plans has previously been submitted to and received the approval of the Commandant.

2. The construction of falsework, pilings, cofferdams or other obstructions, if required, and the scheme for constructing the bridge shall be in accordance with plans submitted to and approved by the Commander, Eighth Coast Guard District, prior to construction of the bridge. All work shall be so conducted that the free navigation of the waterway is not unreasonably interfered with and the present navigable depths are not impaired. Timely notice of any and all events that may affect navigation shall be given to the District Commander during construction of the bridge. The channel or channels through the structure shall be promptly cleared of all obstructions placed therein or caused by the construction of the bridge to the satisfaction of the District Commander, when in the judgment of the District Commander the construction work has reached a point where such action should be taken, but in no case later than 90 days after the bridge has been opened to traffic.

ENCLOSURE(1)

Continuation Sheet

Bridge across the Illinois Waterway at Meredosia
Morgan and Pike Counties, Illinois

(5-14-8)

3. Issuance of this permit does not relieve the permittee of the obligation or responsibility for compliance with the provisions of any other law or regulation as may be under the jurisdiction of any federal, state or local authority having cognizance of any aspect of the location, construction or maintenance of said bridge.

4. A bridge fendering system shall be installed and maintained in good condition by and at the expense of the owner of the bridge when so required by the District Commander. Said installation and maintenance shall be for the safety of navigation and be in accordance with plans submitted to and approved by the District Commander prior to its construction.

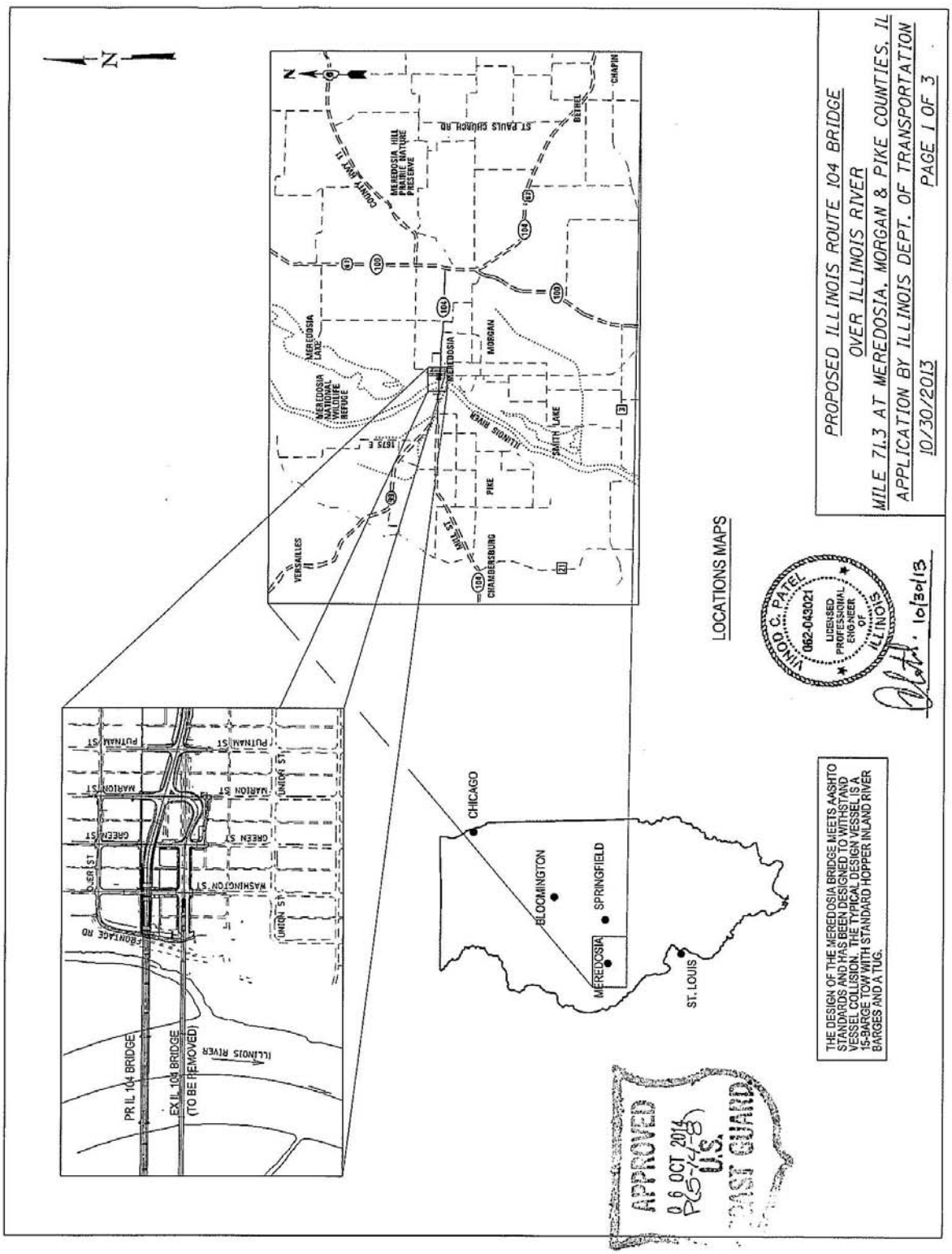
5. Clearance gauges shall be installed and maintained in a good and legible condition by and at the expense of the owner of the bridge when so required by the District Commander. The type of gauges and the locations in which they are to be installed will be submitted to the District Commander for approval.

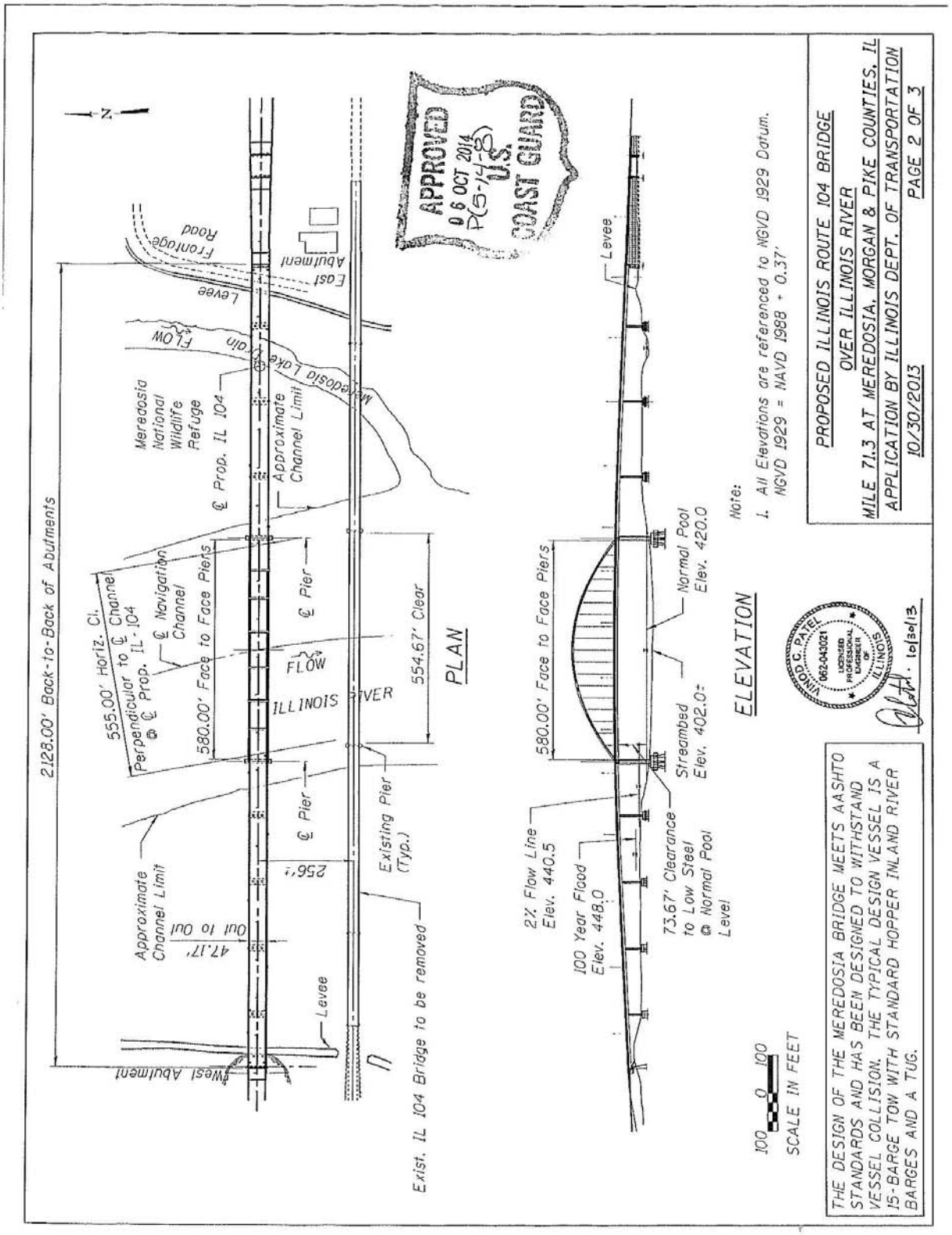
6. Pier 4 of the existing Meredosia Bridge, mile 71.3, will be authorized by a U.S. Army Corps of Engineers permit to be retained as a fishing pier. All other parts of the existing Meredosia Bridge, mile 71.3, not utilized in the new bridge shall be removed down to or below elevation 404.0 feet Mean Sea Level or the natural ground line and the waterway cleared to the satisfaction of the District Commander. A period of 90 days subsequent to the opening to traffic of the new bridge, mile 71.3, will be allowed for such removal and clearance. The proposed method and schedule for removal of the existing bridge shall be submitted to the District Commander for approval prior to commencement of such removal.

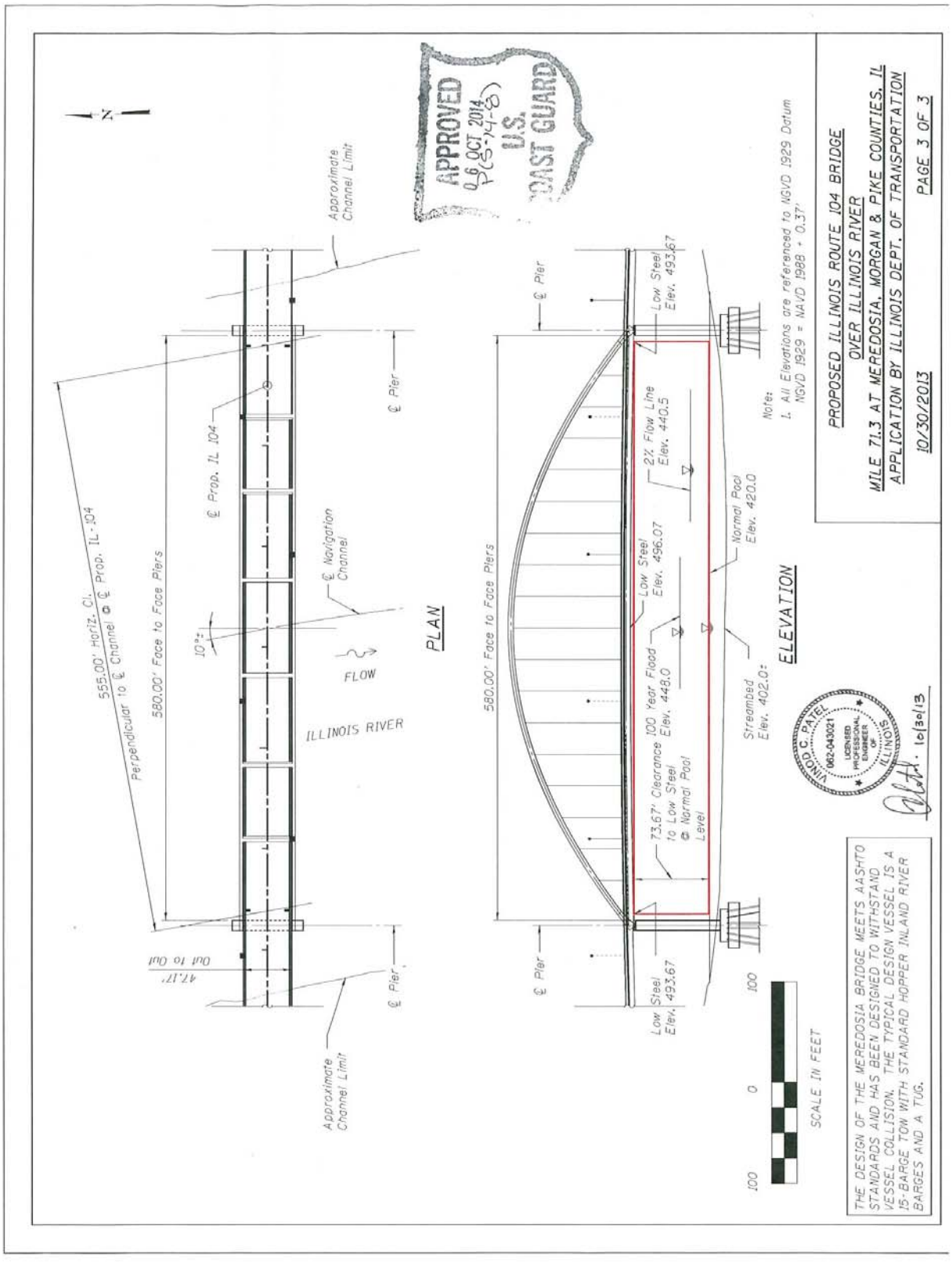
7. When the proposed bridge is no longer used for transportation purposes, it shall be removed in its entirety or to an elevation deemed appropriate by the District Commander and the waterway cleared to the satisfaction of the District Commander. Such removal and clearance shall be completed by and at the expense of the owner of the bridge upon due notice from the District Commander.

8. The approval hereby granted shall cease and be null and void unless construction of the bridge is commenced within three years and completed within five years after the date of this permit.

Brian L. Dunn
Chief, Office of Bridge Programs
U.S. Coast Guard
By direction of the Commandant


PROPOSED ILLINOIS ROUTE 104 BRIDGE
OVER ILLINOIS RIVER
MILE 71.3 AT MEREDOSIA, MORGAN & PIKE COUNTIES, IL
APPLICATION BY ILLINOIS DEPT. OF TRANSPORTATION
10/30/2013
PAGE 1 OF 3
LOCATIONS MAPS
VINOD C. PATEL
062-043021
LICENSED PROFESSIONAL ENGINEER OF ILLINOIS
10/30/13
THE DESIGN OF THE MEREDOSIA BRIDGE MEETS AASHTO STANDARDS AND HAS BEEN DESIGNED TO WITHSTAND VESSEL COLLISION. THE TYPICAL DESIGN VESSEL IS A 15-BARGE TOW WITH STANDARD HOPPER INLAND RIVER BARGES AND A TUG.
CHICAGO
BLOOMINGTON
SPRINGFIELD
MEREDOSIA
ST. LOUIS
PR IL 104 BRIDGE
EX IL 104 BRIDGE
(TO BE REMOVED)
ILLINOIS RIVER
APPROVED
06 OCT 2014
U.S. COAST GUARD


PROPOSED ILLINOIS ROUTE 104 BRIDGE
OVER ILLINOIS RIVER
MILE 71.3 AT MEREDOSIA, MORGAN & PIKE COUNTIES, IL
APPLICATION BY ILLINOIS DEPT. OF TRANSPORTATION
10/30/2013
PAGE 2 OF 3
APPROVED
06 OCT 2014
U.S. COAST GUARD
PLAN
ELEVATION
2128.00' Back-to-Back of Abutments
West Abutment
East Abutment
Levee
Frontage Road
Meredosia National Wildlife Refuge
℄ Prop. IL 104
Approximate Channel Limit
Meredosia Lake
555.00' Horiz. Cl. Channel Perpendicular to ℄ Prop. IL 104
℄ Navigation Channel
580.00' Face to Face Piers
℄ Pier
FLOW
ILLINOIS RIVER
554.67' Clear
Existing Pier (Typ.)
Exist. IL 104 Bridge to be removed
256'
47.17'
Out to Out
2% Flow Line Elev. 440.5
100 Year Flood Elev. 448.0
73.67' Clearance to Low Steel @ Normal Pool Level
Streambed Elev. 402.0±
Normal Pool Elev. 420.0
Note:
1. All Elevations are referenced to NGVD 1929 Datum. NGVD 1929 = NAVD 1988 + 0.37'
100 0 100
SCALE IN FEET
THE DESIGN OF THE MEREDOSIA BRIDGE MEETS AASHTO STANDARDS AND HAS BEEN DESIGNED TO WITHSTAND VESSEL COLLISION. THE TYPICAL DESIGN VESSEL IS A 15-BARGE TOW WITH STANDARD HOPPER INLAND RIVER BARGES AND A TUG.
VINOD C. PATEL
062-043021
LICENSED PROFESSIONAL ENGINEER
ILLINOIS
10/30/13


APPROVED
06 OCT 2014
U.S. COAST GUARD
PROPOSED ILLINOIS ROUTE 104 BRIDGE
OVER ILLINOIS RIVER
MILE 71.3 AT MEREDOSIA, MORGAN & PIKE COUNTIES, IL
APPLICATION BY ILLINOIS DEPT. OF TRANSPORTATION
10/30/2013
PAGE 3 OF 3
PLAN
ELEVATION
Approximate Channel Limit
℄ Pier
℄ Prop. IL 104
℄ Navigation Channel
555.00' Horiz. Cl. Perpendicular to ℄ Channel @ ℄ Prop. IL 104
580.00' Face to Face Piers
10°±
FLOW
ILLINOIS RIVER
Out to Out
47.17'
Low Steel Elev. 493.67
2% Flow Line Elev. 440.5
Low Steel Elev. 496.07
100 Year Flood Elev. 448.0
73.67' Clearance to Low Steel @ Normal Pool Level
Normal Pool Elev. 420.0
Streambed Elev. 402.0±
Note:
1. All Elevations are referenced to NGVD 1929 Datum
NGVD 1929 = NAVD 1988 + 0.37'
100 0 100
SCALE IN FEET
THE DESIGN OF THE MEREDOSIA BRIDGE MEETS AASHTO STANDARDS AND HAS BEEN DESIGNED TO WITHSTAND VESSEL COLLISION. THE TYPICAL DESIGN VESSEL IS A 15-BARGE TOW WITH STANDARD HOPPER INLAND RIVER BARGES AND A TUG.
VINOD C. PATEL
062-043021
LICENSED PROFESSIONAL ENGINEER OF ILLINOIS
10/30/13

NAVIGATION LIGHTS
FOR THE
MEREDOSIA BRIDGE
MILE 71.3, ILLINOIS WATERWAY

The center of the navigation channel span shall be marked by a range of two green lights. Each green light shall show through a horizontal arc of 360 degrees and shall be securely mounted just below the outermost edge of the bridge span structure in line with the axis of the channel so as to be visible from an approaching vessel.

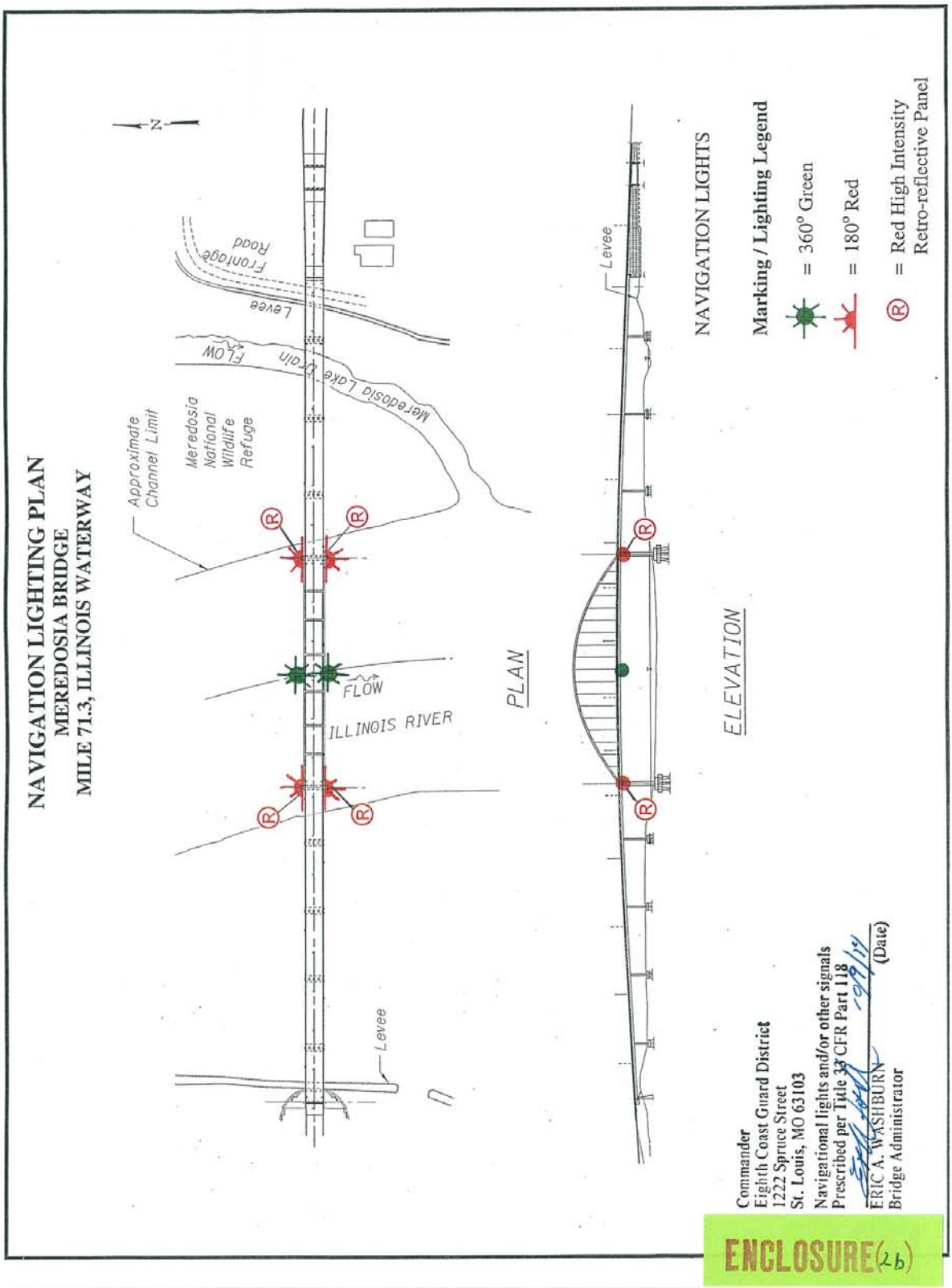
The upstream and downstream sides of the channel piers shall be marked with red lights. Each red light shall show through a horizontal arc of 180 degrees and shall be securely mounted no higher than the green navigation lights to show 90 degrees on either side of a line parallel to the axis of the channel so as to be visible from an approaching vessel.

Each margin of the channel piers, one on the upstream side and one on the downstream side shall be marked with high intensity red retro-reflective material, which measures two feet per side. The high intensity red retro-reflective panels should be placed near the top of the red navigation lights so as to effectively reflect the searchlight of an approaching vessel but not positioned so as to obscure the red navigation lights.

The lights and retro-reflective panels prescribed above shall be displayed from sunset to sunrise each night of the year and at other times when the visibility is less than one mile. The lights shall be of sufficient candlepower as to be visible against the background lighting at a distance of at least 2,000 yards 90% of the nights of the year.

Responsibility of the owner does not cease upon installation of the prescribed lights and retro-reflective panels. Provisions for maintaining all lights and reflectors prescribed herein should be included in the planning for initial installation. A continuing program of inspection and maintenance is necessary to insure that the lights and reflectors are properly displayed.

This is enclosure (2a) to CGD8 (dwb) ltr dated October 9, 2014


NAVIGATION LIGHTING PLAN
MEREDOSIA BRIDGE
MILE 71.3, ILLINOIS WATERWAY
N
Frontage Road
Levee
FLOW
Meredosia Lake Drain
Meredosia National Wildlife Refuge
Approximate Channel Limit
FLOW
ILLINOIS RIVER
Levee
PLAN
Levee
NAVIGATION LIGHTS
ELEVATION
Marking / Lighting Legend
= 360° Green
= 180° Red
= Red High Intensity Retro-reflective Panel
Commander
Eighth Coast Guard District
1222 Spruce Street
St. Louis, MO 63103
Navigational lights and/or other signals
Prescribed per Title 33 CFR Part 118
ERIC A. WASHBURN
Bridge Administrator
(Date)
ENCLOSURE(2b)

VERTICAL CLEARANCE GAUGES
FOR THE
MEREDOSIA BRIDGE
MILE 71.3, ILLINOIS WATERWAY

Vertical clearance gauges shall be installed on the upstream side of the right descending channel pier and the downstream side of the left descending channel pier. The E Series, 36-inch standard numerals shall be used unless the width of the pier will not accommodate this size gauge, in which case the largest numeral compatible with the width of the pier shall be used. The line indicating the topmost numeral of the gauge shall be at least 30 feet below low steel of the bridge. The line indicating the bottom numeral shall be at least 60 feet below low steel of the bridge.

The gauge prescribed herein shall read from top to bottom and measure the distance from low steel to the bottom of the foot marks.

Responsibility of the owner does not cease upon installation of the prescribed clearance gauge. Provision for maintaining the clearance gauge prescribed herein should be included in the planning for initial installation. A continuing program of inspection and maintenance is necessary to ensure that the clearance gauge is accurate and properly displayed.

This is enclosure (3) to CGD8 (dwb) ltr dated October 9, 2014

PROJECT LABOR AGREEMENT - QUARTERLY EMPLOYMENT REPORT

Public Act 97-0199 requires the Department to submit quarterly reports regarding the number of minorities and females employed under Project Labor Agreements. To assist in this reporting effort, the Contractor shall provide a quarterly workforce participation report for all minority and female employees working under the project labor agreement of this contract. The data shall be reported on Construction Form BC 820, Project Labor Agreement (PLA) Workforce Participation Quarterly Reporting Form available on the Department's website http://www.dot.il.gov/const/conforms.html.

The report shall be submitted no later than the 15th of the month following the end of each quarter (i.e. April 15 for the January – March reporting period). The form shall be emailed to DOT.PLA.Reporting@illinois.gov or faxed to (217) 524-4922.

Any costs associated with complying with this provision shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

Illinois Department of Transportation
PROJECT LABOR AGREEMENT

This Project Labor Agreement ("PLA" or "Agreement") is entered into this _____ day of _____, 2014, by and between the Illinois Department of Transportation ("IDOT" or "Department") in its proprietary capacity, and each relevant Illinois AFL-CIO Building Trades signatory hereto as determined by the Illinois AFL-CIO Statewide Project Labor Agreement Committee on behalf of each of its affiliated members (individually and collectively, the "Unions"). This PLA shall apply to Construction Work (as defined herein) to be performed by IDOT's Prime Contractor and each of its subcontractors of whatever tier ("Subcontractor" or "Subcontractors") on Contract No. **72B58** (hereinafter, the "Project").

ARTICLE 1 - INTENT AND PURPOSES

1.1 This PLA is entered into in accordance with the Project Labor Agreement Act ("Act", 30 ILCS 571). It is mutually understood and agreed that the terms and conditions of this PLA are intended to promote the public interest in obtaining timely and economical completion of the Project by encouraging productive and efficient construction operations; by establishing a spirit of harmony and cooperation among the parties; and by providing for peaceful and prompt settlement of any and all labor grievances or jurisdictional disputes of any kind without strikes, lockouts, slowdowns, delays, or other disruptions to the prosecution of the work. The parties acknowledge the obligations of the Contractors and Subcontractors to comply with the provisions of the Act. The parties will work with the Contractors and Subcontractors within the parameters of other statutory and regulatory requirements to implement the Act's goals and objectives.

1.2 As a condition of the award of the contract for performance of work on the Project, IDOT's Prime Contractor and each of its Subcontractors shall execute a "Contractor Letter of Assent", in the form attached hereto as Exhibit A, prior to commencing Construction Work on the Project. The Contractor shall submit a Subcontractor's Contractor Letter of Assent to the Department prior to the Subcontractor's performance of Construction Work on the Project. Upon request copies of the applicable collective bargaining agreements will be provided by the appropriate signatory labor organization consistent with this Agreement and at the pre-job conference referenced in Article III, Section 3.1.

1.3 Each Union affiliate and separate local representing workers engaged in Construction Work on the Project in accordance with this PLA are bound to this agreement by the Illinois AFL-CIO Statewide Project Labor Agreement Committee which is the central committee established with full authority to negotiate and sign PLAs with the State on behalf of all respective crafts. Upon their signing the Contractor Letter of Assent, the Prime Contractor, each Subcontractor, and the individual Unions shall thereafter be deemed a party to this PLA. No party signatory to this PLA shall, contract or subcontract, nor permit any other person, firm, company, or entity to contract or subcontract for the performance of Construction Work for the Project to any person, firm, company, or entity that does not agree in writing to become bound for the term of this Project by the terms of this PLA prior to commencing such work and to the applicable area-wide collective bargaining agreement(s) with the Union(s) signatory hereto.

1.4 It is understood that the Prime Contractor(s) and each Subcontractor will be considered and accepted by the Unions as separate employers for the purposes of collective bargaining, and it is further agreed that the employees working under this PLA shall constitute a bargaining unit separate and distinct from all others. The parties hereto also agree that this PLA shall be applicable solely with respect to this Project, and shall have no bearing on the interpretation of any other collective bargaining agreement or as to the recognition of any bargaining unit other than for the specific purposes of this Project.

1.5 In the event of a variance or conflict, whether explicit or implicit, between the terms and conditions of this PLA and the provisions of any other applicable national, area, or local collective bargaining agreement, the terms and conditions of this PLA shall supersede and control. For any work performed under the NTL Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, the National Agreement of the International Union of Elevator Constructors, and for any instrument calibration work and loop checking performed under the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians, the preceding sentence shall apply only with respect to Articles I, II, V, VI, and VII.

1.6 Subject to the provisions of paragraph 1.5 of this Article, it is the parties' intent to respect the provisions of any other collective bargaining agreements that may now or hereafter pertain, whether between the Prime Contractor and one or more of the Unions or between a Subcontractor and one or more of the Unions. Accordingly, except and to the extent of any contrary provision set forth in this PLA, the Prime Contractor and each of its Subcontractors agrees to be bound and abide by the terms of the following in order of precedence: (a) the applicable collective bargaining agreement between the Prime Contractor and one or more of the Unions made signatory hereto; (b) the applicable collective bargaining agreement between a Subcontractor and one or more of the Unions made signatory hereto; or (c) the current applicable area collective bargaining agreement for the relevant Union that is the agreement certified by the Illinois Department of Labor for purposes of establishing the Prevailing Wage applicable to the Project. The Union will provide copies of the applicable collective bargaining agreements pursuant to part (c) of the preceding sentence to the Prime Contractor. Assignments by the Contractors or Subcontractors amongst the trades shall be consistent with area practices; in the event of unresolved disagreements as to the propriety of such assignments, the provisions of Article VI shall apply.

1.7 Subject to the limitations of paragraphs 1.4 to 1.6 of this Article, the terms of each applicable collective bargaining agreement as determined in accordance with paragraph 1.6 are incorporated herein by reference, and the terms of this PLA shall be deemed incorporated into such other applicable collective bargaining agreements only for purposes of their application to the Project.

1.8 To the extent necessary to comply with the requirements of any fringe benefit fund to which the Prime Contractor or Subcontractor is required to contribute under the terms of an applicable collective bargaining agreement pursuant to the preceding paragraph, the Prime Contractor or Subcontractor shall execute all "Participation Agreements" as may be reasonably required by the Union to accomplish such purpose; provided, however, that such Participation Agreements shall, when applicable to the Prime Contractor or Subcontractor solely as a result of this PLA, be amended as reasonably necessary to reflect such fact. Upon written notice in the form of a lien of a Contractor's or Subcontractor's delinquency from any applicable fringe benefit fund, IDOT will withhold from the Contractor's periodic pay request an amount sufficient to extinguish any delinquency obligation of the Contractor or Subcontractor arising out of the Project.

1.9 In the event that the applicable collective bargaining agreement between a Prime Contractor and the Union or between the Subcontractor and the Union expires prior to the completion of this Project, the expired applicable contract's terms will be maintained until a new applicable collective bargaining agreement is ratified. The wages and fringe benefits included in any new applicable collective bargaining agreement will apply on and after the effective date of the newly negotiated collective bargaining agreement, except to the extent wage and fringe benefit retroactivity is specifically agreed upon by the relevant bargaining parties.

ARTICLE II – APPLICABILITY, RECOGNITION, AND COMMITMENTS

2.1 The term Construction Work as used herein shall include all "construction, demolition, rehabilitation, renovation, or repair" work performed by a "laborer or mechanic" at the "site of the work" for the purpose of "building" the specific structures and improvements that constitute the Project. Terms appearing within quotation marks in the preceding sentence shall have the meaning ascribed to them pursuant to 29 CFR Part 5 and Illinois labor laws.

2.2 By executing the Letters of Assent, Prime Contractor and each of its Subcontractors recognizes the Unions signatory to this PLA as the sole and exclusive bargaining representatives for their craft employees employed on the jobsite for this Project. Unions who are signatory to this PLA will have recognition on the Project for their craft.

2.3 The Prime Contractor and each of its Subcontractors retains and shall be permitted to exercise full and exclusive authority and responsibility for the management of its operations, except as expressly limited by the terms of this PLA or by the terms and conditions of the applicable collective bargaining agreement.

2.4 Except to the extent contrary to an express provision of the relevant collective bargaining agreement, equipment or materials used in the Project may be pre-assembled or pre-fabricated, and there shall be no refusal by the Union to handle, transport, install, or connect such equipment or materials. Equipment or materials delivered to the job-site will be unloaded and handled promptly without regard to potential jurisdictional disputes; any such disputes shall be handled in accordance with the provisions of this PLA.

2.5 The parties are mutually committed to promoting a safe working environment for all personnel at the job-site. It shall be the responsibility of each employer to which this PLA applies to provide and maintain safe working conditions for its employees, and to comply with all applicable federal, state, and local health and safety laws and regulations.

2.6 The use or furnishing of alcohol or drugs and the conduct of any other illegal activity at the job-site is strictly prohibited. The parties shall take every practical measure consistent with the terms of applicable collective bargaining agreements to ensure that the job-site is free of alcohol and drugs.

2.7 All parties to this PLA agree that they will not discriminate against any employee based on race, creed, religion, color, national origin, union activity, age, gender or sexual orientation and shall comply with all applicable federal, state, and local laws.

2.8 In accordance with the Act and to promote diversity in employment, IDOT will establish, in cooperation with the other parties, the apprenticeship hours which are to be performed by minorities and females on the Project. IDOT shall consider the total hours to be performed by these underrepresented groups, as a percentage of the workforce, and create aspirational goals for each Project, based on the level of underutilization for the service area of the Project (together "Project Employment Objectives"). IDOT shall provide a quarterly report regarding the racial and gender composition of the workforce on the Project.

Persons currently lacking qualifications to enter apprenticeship programs will have the opportunity to obtain skills through basic training programs as have been established by the Department. The parties will endeavor to support such training programs to allow participants to obtain the requisite qualifications for the Project Employment Objectives.

The parties agree that all Contractors and Subcontractors working on the Project shall be encouraged to utilize the maximum number of apprentices as permitted under the terms of the applicable collective bargaining agreements to realize the Project Employment Objectives.

The Unions shall assist the Contractor and each Subcontractor in efforts to satisfy Project Employment Objectives. A Contractor or Subcontractor may request from a Union specific categories of workers necessary to satisfy Project Employment Objectives. The application of this section shall be consistent with all local Union collective bargaining agreements, and the hiring hall rules and regulations established for the hiring of personnel, as well as the apprenticeship standards set forth by each individual Union.

2.9 The parties hereto agree that engineering/architectural/surveying consultants' materials testing employees are subject to the terms of this PLA for Construction Work performed for a Contractor or Subcontractor on this Project. These workers shall be fully expected to objectively and responsibly perform their duties and obligations owed to the Department without regard to the potential union affiliation of such employees or of other employees on the Project.

2.10 This Agreement shall not apply to IDOT employees or employees of any other governmental entity.

ARTICLE III - ADMINISTRATION OF AGREEMENT

3.1 In order to assure that all parties have a clear understanding of the PLA, and to promote harmony, at the request of the Unions a post-award pre-job conference will be held among the Prime Contractor, all Subcontractors and Union representatives prior to the start of any Construction Work on the Project. No later than the conclusion of such pre-job conference, the parties shall, among other matters, provide to one another contact information for their respective representatives (including name, address, phone number, facsimile number, e-mail). Nothing herein shall be construed to limit the right of the Department to discuss or explain the purpose and intent of this PLA with prospective bidders or other interested parties prior to or following its award of the job.

3.2 Representatives of the Prime Contractor and the Unions shall meet as often as reasonably necessary following award until completion of the Project to assure the effective implementation of this PLA.

3.3 Any notice contemplated under Article VI and VII of this Agreement to a signatory labor organization shall be made in writing to the Local Union with copies to the local union's International Representative.

ARTICLE IV - HOURS OF WORK AND GENERAL CONDITIONS

4.1 The standard work day and work week for Construction Work on the Project shall be consistent with the respective collective bargaining agreements. In the event Project site or other job conditions dictate a change in the established starting time and/or a staggered lunch period for portions of the Project or for specific crafts, the Prime Contractor, relevant Subcontractors and business managers of the specific crafts involved shall confer and mutually agree to such changes as appropriate. If proposed work schedule changes cannot be mutually agreed upon between the parties, the hours fixed at the time of the pre-job meeting shall prevail.

4.2 Shift work may be established and directed by the Prime Contractor or relevant Subcontractor as reasonably necessary or appropriate to fulfill the terms of its contract with the Department. If used, shift hours, rates and conditions shall be as provided in the applicable collective bargaining agreement.

4.3 The parties agree that chronic and/or unexcused absenteeism is undesirable and must be controlled in accordance with procedures established by the applicable collective bargaining agreement. Any employee disciplined for absenteeism in accordance with such procedures shall be suspended from all work on the Project for not less than the maximum period permitted under the applicable collective bargaining agreement.

4.4 Except as may be otherwise expressly provided by the applicable collective bargaining agreement, employment begins and ends at the Project site; employees shall be at their place of work at the starting time; and employees shall remain at their place of work until quitting time.

4.5 Except as may be otherwise expressly provided by the applicable collective bargaining agreement, there shall be no limit on production by workmen, no restrictions on the full use of tools or equipment, and no restrictions on efficient use of manpower or techniques of construction other than as may be required by safety regulations.

4.6 The parties recognize that specialized or unusual equipment may be installed on the Project. In such cases, the Union recognizes the right of the Prime Contractor or Subcontractor to involve the equipment supplier or vendor's personnel in supervising the setting up of the equipment, making modifications and final alignment, and performing similar activities that may be reasonably necessary prior to and during the start-up procedure in order to protect factory warranties. The Prime Contractor or Subcontractor shall notify the Union representatives in advance of any work at the job-site by such vendor personnel in order to promote a harmonious relationship between the equipment vendor's personnel and other Project employees.

4.7 For the purpose of promoting full and effective implementation of this PLA, authorized Union representatives shall have access to the Project job-site during scheduled work hours. Such access shall be conditioned upon adherence to all reasonable visitor and security rules of general applicability that may be established for the Project site at the pre-job conference or from time to time thereafter.

ARTICLE V – GRIEVANCE PROCEDURES FOR DISPUTES ARISING UNDER A PARTICULAR COLLECTIVE BARGAINING AGREEMENT

5.1 In the event a dispute arises under a particular collective bargaining agreement specifically not including jurisdictional disputes referenced in Article VI below, said dispute shall be resolved by the Grievance/Arbitration procedure of the applicable collective bargaining agreement. The resulting determination from this process shall be final and binding on all parties bound to its process.

5.2 Employers covered under this Agreement shall have the right to discharge or discipline any employee who violates the provisions of this Agreement. Such discharge or discipline by a contractor or subcontractor shall be subject to Grievance/Arbitration procedure of the applicable collective bargaining agreement only as to the fact of such violation of this agreement. If such fact is established, the penalty imposed shall not be disturbed. Work at the Project site shall continue without disruption or hindrance of any kind as a result of a Grievance/Arbitration procedure under this Article.

5.3 In the event there is a deadlock in the foregoing procedure, the parties agree that the matter shall be submitted to arbitration for the selection and decision of an Arbitrator governed under paragraph 6.8.

ARTICLE VI –DISPUTES: GENERAL PRINCIPLES

6.1 This Agreement is entered into to prevent strikes, lost time, lockouts and to facilitate the peaceful adjustment of jurisdictional disputes in the building and construction industry and to prevent waste and unnecessary avoidable delays and expense, and for the further purpose of at all times securing for the employer sufficient skilled workers.

6.2 A panel of Permanent Arbitrators are attached as addendum (A) to this agreement. By mutual agreement between IDOT and the Unions, the parties can open this section of the agreement as needed to make changes to the list of permanent arbitrators.

6.3 The PLA Jurisdictional Dispute Resolution Process ("Process") sets forth the procedures below to resolve jurisdictional disputes between and among Contractors, Subcontractors, and Unions engaged in the building and construction industry. Further, the Process will be followed for any grievance or dispute arising out of the interpretation or application of this PLA by the parties except for the prohibition on attorneys contained in 6.11. All decisions made through the Process are final and binding upon all parties.

DISPUTE PROCESS

6.4 Administrative functions under the Process shall be performed through the offices of the President and/or Secretary-Treasurer of the Illinois State Federation of Labor, or their designated representative, called the Administrator. In no event shall any officer, employee, agent, attorney, or other representative of the Illinois Federation of Labor, AFL-CIO be subject to any subpoena to appear or testify at any jurisdictional dispute hearing.

6.5 There shall be no abandonment of work during any case participating in this Process or in violation of the arbitration decision. All parties to this Process release the Illinois State Federation of Labor ("Federation") from any liability arising from its action or inaction and covenant not to sue the Federation, nor its officers, employees, agents or attorneys.

6.6 In the event of a dispute relating to trade or work jurisdiction, all parties, including the employers, Contractors or Subcontractors, agree that a final and binding resolution of the dispute shall be resolved as follows:

(a) Representatives of the affected trades and the Contractor or Subcontractor shall meet on the job site within two (2) business days after receiving written notice in an effort to resolve the dispute. (In the event there is a dispute between local unions affiliated with the same International Union, the decision of the General President, or his/her designee, as the internal jurisdictional authority of that International Union, shall constitute a final and binding decision and determination as to the jurisdiction of work.)

(b) If no settlement is achieved subsequent to the preceding Paragraph, the matter shall be referred to the local area Building & Construction Trades Council, which shall meet with the affected trades within two (2) business days subsequent to receiving written notice. In the event the parties do not wish to avail themselves of the local Building & Construction Trades Council, the parties may elect to invoke the services of their respective International Representatives with no extension of the time limitations. An agreement reached at this Step shall be final and binding upon all parties.

(c) If no settlement agreement is reached during the proceedings contemplated by Paragraphs “a” or “b” above, the matter shall be immediately referred to the Illinois Jurisdictional Dispute Process for final and binding resolution of said dispute. Said referral submission shall be in writing and served upon the Illinois State Federation of Labor, or the Administrator, pursuant to paragraph 6.4 of this agreement. The Administrator shall, within three (3) days, provide for the selection of an available Arbitrator to hear said dispute within this time period. Upon good cause shown and determined by the Administrator, an additional three (3) day extension for said hearing shall be granted at the sole discretion of the Administrator. Only upon mutual agreement of all parties may the Administrator extend the hearing for a period in excess of the time frames contemplated under this Paragraph. Business days are defined as Monday through Friday, excluding contract holidays.

6.7 The primary concern of the Process shall be the adjustment of jurisdictional disputes arising out of the Project. A sufficient number of Arbitrators shall be selected from list of approved Arbitrators as referenced Sec. 6.2 and shall be assigned per Sec. 6.8. Decisions shall be only for the Project and shall become effective immediately upon issuance and complied with by all parties. The authority of the Arbitrator shall be restricted and limited specifically to the terms and provisions of Article VI and generally to this Agreement as a whole.

6.8 The Arbitrator chosen shall be randomly selected based on the list of Arbitrators in Sec. 6.2 and geographical location of the jurisdictional dispute and upon his/her availability, and ability to conduct a Hearing within two (2) business days of said notice. The Arbitrator may issue a “bench” decision immediately following the Hearing or he/she may elect to only issue a written decision, said decision must be issued within two (2) business days subsequent to the completion of the Hearing. Copies of all notices, pleadings, supporting memoranda, decisions, etc. shall be provided to all disputing parties and the Illinois State Federation of Labor.

Any written decision shall be in accordance with this Process and shall be final and binding upon all parties to the dispute and may be a “short form” decision. Fees and costs of the arbitrator shall be divided evenly between the contesting parties except that any party wishing a full opinion and decision beyond the short form decision shall bear the reasonable fees and costs of such full opinion. The decision of the Arbitrator shall be final and binding upon the parties hereto, their members, and affiliates.

In cases of jurisdictional disputes or other disputes between a signatory labor organization and another labor organization, both of which is an affiliate or member of the same International Union, the matter or dispute shall be settled in the manner set forth by their International Constitution and/or as determined by the International Union’s General President whose decision shall be final and binding upon all parties. In no event shall there be an abandonment of work.

6.9 In rendering a decision, the Arbitrator shall determine:

(a) First, whether a previous agreement of record or applicable agreement, including a disclaimer agreement, between National or International Unions to the dispute or agreements between local unions involved in the dispute, governs;

(b) Only if the Arbitrator finds that the dispute is not covered by an appropriate or applicable agreement of record or agreement between the crafts to the dispute, he shall then consider the established trade practice in the industry and prevailing practice in the locality. Where there is a previous decision of record governing the case, the Arbitrator shall give equal weight to such decision of record, unless the prevailing practice in the locality in the past ten years favors one craft. In that case, the Arbitrator shall base his decision on the prevailing practice in the locality. Except, that if the Arbitrator finds that a craft has improperly obtained the prevailing practice in the locality through raiding, the undercutting of wages or by the use of vertical agreements, the Arbitrator shall rely on the decision of record and established trade practice in the industry rather than the prevailing practice in the locality; and,

(c) Only if none of the above criteria is found to exist, the Arbitrator shall then consider that because efficiency, cost or continuity and good management are essential to the well being of the industry, the interests of the consumer or the past practices of the employer shall not be ignored.

6.10 The Arbitrator shall set forth the basis for his/her decision and shall explain his/her findings regarding the applicability of the above criteria. If lower ranked criteria are relied upon, the Arbitrator shall explain why the higher-ranked criteria were not deemed applicable. The Arbitrator's decision shall only apply to the Project. Agreements of Record, for other PLA projects, are applicable only to those parties signatory to such agreements. Decisions of Record are those that were either attested to by the former Impartial Jurisdictional Disputes Board or adopted by the National Arbitration Panel.

6.11 All interested parties, as determined by the Arbitrator, shall be entitled to make presentations to the Arbitrator. Any interested labor organization affiliated to the PLA Committee and party present at the Hearing, whether making a presentation or not, by such presence shall be deemed to accept the jurisdiction of the Arbitrator and to agree to be bound by its decision. In addition to the representative of the local labor organization, a representative of the labor organization's International Union may appear on behalf of the parties. Each party is responsible for arranging for its witnesses. In the event an Arbitrator's subpoena is required, the party requiring said subpoena shall prepare the subpoena for the Arbitrator to execute. Service of the subpoena upon any witness shall be the responsibility of the issuing party.

Attorneys shall not be permitted to attend or participate in any portion of a Hearing.

The parties are encouraged to determine, prior to Hearing, documentary evidence which may be presented to the Arbitrator on a joint basis.

6.12 The Order of Presentation in all Hearings before an Arbitrator shall be

I. Identification and Stipulation of the Parties
II. Unions(s) claiming the disputed work presents its case
III. Union(s) assigned the disputed work presents its case
IV. Employer assigning the disputed work presents its case
V. Evidence from other interested parties (i.e., general contractor, project manager, owner)
VI. Rebuttal by union(s) claiming the disputed work
VII. Additional submissions permitted and requested by Arbitrator
VIII. Closing arguments by the parties

6.13 All parties bound to the provisions of this Process hereby release the Illinois State Federation of Labor and IDOT, their respective officers, agents, employees or designated representatives, specifically including any Arbitrator participating in said Process, from any and all liability or claim, of whatsoever nature, and specifically incorporating the protections provided in the Illinois Arbitration Act, as amended from time to time.

6.14 The Process, as an arbitration panel, nor its Administrator, shall have any authority to undertake any action to enforce its decision(s). Rather, it shall be the responsibility of the prevailing party to seek appropriate enforcement of a decision, including findings, orders or awards of the Arbitrator or Administrator determining non-compliance with a prior award or decision.

6.15 If at any time there is a question as to the jurisdiction of the Illinois Jurisdictional Dispute Resolution Process, the primary responsibility for any determination of the arbitrability of a dispute and the jurisdiction of the Arbitrator shall be borne by the party requesting the Arbitrator to hear the underlying jurisdictional dispute. The affected party or parties may proceed before the Arbitrator even in the absence or one or more stipulated parties with the issue of jurisdiction as an additional item to be decided by the Arbitrator. The Administrator may participate in proceedings seeking a declaration or determination that the underlying dispute is subject to the jurisdiction and process of the Illinois Jurisdictional Dispute Resolution Process. In any such proceedings, the non-prevailing party and/or the party challenging the jurisdiction of the Illinois Jurisdictional Dispute Resolution Process shall bear all the costs, expenses and attorneys' fees incurred by the Illinois Jurisdictional Dispute Resolution Process and/or its Administrator in establishing its jurisdiction.

ARTICLE VII - WORK STOPPAGES AND LOCKOUTS

7.1 During the term of this PLA, no Union or any of its members, officers, stewards, employees, agents or representatives shall instigate, support, sanction, maintain, or participate in any strike, picketing, walkout, work stoppage, slow down or other activity that interferes with the routine and timely prosecution of work at the Project site or at any other contractor's or supplier's facility that is necessary to performance of work at the Project site. Hand billing at the Project site during the designated lunch period and before commencement or following conclusion of the established standard workday shall not, in itself, be deemed an activity that interferes with the routine and timely prosecution of work on the Project.

7.2 Should any activity prohibited by paragraph 7.1 of this Article occur, the Union shall undertake all steps reasonably necessary to promptly end such prohibited activities.

7.2.A No Union complying with its obligations under this Article shall be liable for acts of employees for which it has no responsibility or for the unauthorized acts of employees it represents. Any employee who participates or encourages any activity prohibited by paragraph 7.1 shall be immediately suspended from all work on the Project for a period equal to the greater of (a) 60 days; or (b) the maximum disciplinary period allowed under the applicable collective bargaining agreement for engaging in comparable unauthorized or prohibited activity.

7.2.B Neither the PLA Committee nor its affiliates shall be liable for acts of employees for which it has no responsibility. The principal officer or officers of the PLA Committee will immediately instruct, order and use the best efforts of his office to cause the affiliated union or unions to cease any violations of this Article. The PLA Committee in its compliance with this obligation shall not liable for acts of its affiliates. The principal officer or officers of any involved affiliate will immediately instruct, order or use the best effort of his office to cause the employees the union represents to cease any violations of this Article. A union complying with this obligation shall not be liable for unauthorized acts of employees it represents. The failure of the Contractor to exercise its rights in any instance shall not be deemed a waiver of its rights in any other instance.

During the term of this PLA, the Prime Contractor and its Subcontractors shall not engage in any lockout at the Project site of employees covered by this Agreement.

7.3 Upon notification of violations of this Article, the principal officer or officers of the local area Building and Construction Trades Council, and the Illinois AFL-CIO Statewide Project Labor Agreement Committee as appropriate, will immediately instruct, order and use their best efforts to cause the affiliated union or unions to cease any violations of this Article. A Trades Council and the Committee otherwise in compliance with the obligations under this paragraph shall not be liable for unauthorized acts of its affiliates.

7.4 In the event that activities in violation of this Article are not immediately halted through the efforts of the parties, any aggrieved party may invoke the special arbitration provisions set forth in paragraph 7.5 of this Article.

7.5 Upon written notice to the other involved parties by the most expeditious means available, any aggrieved party may institute the following special arbitration procedure when a breech of this Article is alleged:

7.5.A The party invoking this procedure shall notify the individual designated as the Permanent Arbitrator pursuant to paragraph 6.8 of the nature of the alleged violation; such notice shall be by the most expeditious means possible. The initiating party may also furnish such additional factual information as may be reasonably necessary for the Permanent Arbitrator to understand the relevant circumstances. Copies of any written materials provided to the arbitrator shall also be contemporaneously provided by the most expeditious means possible to the party alleged to be in violation and to all other involved parties.

7.5.B Upon receipt of said notice the Permanent Arbitrator shall set and hold a hearing within twenty-four (24) hours if it is contended the violation is ongoing, but not before twenty-four (24) hours after the written notice to all parties involved as required above.

7.5.C The Permanent Arbitrator shall notify the parties by facsimile or any other effective written means, of the place and time chosen by the Permanent Arbitrator for this hearing. Said hearing shall be completed in one session. A failure of any party or parties to attend said hearing shall not delay the hearing of evidence or issuance of an Award by the Permanent Arbitrator.

7.5.D The sole issue at the hearing shall be whether a violation of this Article has, in fact, occurred. An Award shall be issued in writing within three (3) hours after the close of the hearing, and may be issued without a written opinion. If any party desires a written opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the Award. The Permanent Arbitrator may order cessation of the violation of this Article, and such Award shall be served on all parties by hand or registered mail upon issuance.

7.5.E Such Award may be enforced by any court of competent jurisdiction upon the filing of the Award and such other relevant documents as may be required. Facsimile or other hardcopy written notice of the filing of such enforcement proceedings shall be given to the other relevant parties. In a proceeding to obtain a temporary order enforcing the Permanent Arbitrator's Award as issued under this Article, all parties waive the right to a hearing and agree that such proceedings may be ex parte. Such agreement does not waive any party's right to participate in a hearing for a final order of enforcement. The Court's order or orders enforcing the Permanent Arbitrator's Award shall be served on all parties by hand or by delivery to their last known address or by registered mail.

7.6 Individuals found to have violated the provisions of this Article are subject to immediate termination. In addition, IDOT reserves the right to terminate this PLA as to any party found to have violated the provisions of this Article.

7.7 Any rights created by statue or law governing arbitration proceedings inconsistent with the above procedure or which interfere with compliance therewith are hereby waived by parties to whom they accrue.

7.8 The fees and expenses of the Permanent Arbitrator shall be borne by the party or parties found in violation, or in the event no violation is found, such fees and expenses shall be borne by the moving party.

ARTICLE VIII – TERMS OF AGREEMENT

8.1 If any Article or provision of this Agreement shall be declared invalid, inoperative or unenforceable by operation of law or by any of the above mentioned tribunals of competent jurisdiction, the remainder of this Agreement or the application of such Article or provision to persons or circumstances other than those as to which it has been held invalid, inoperative or unenforceable shall not be affected thereby.

8.2 This Agreement shall be in full force as of and from the date of the Notice of Award until the Project contract is closed.

8.3 This PLA may not be changed or modified except by the subsequent written agreement of the parties. All parties represent that they have the full legal authority to enter into this PLA. This PLA may be executed by the parties in one or more counterparts.

8.4 Any liability arising out of this PLA shall be several and not joint. IDOT shall not be liable to any person or other party for any violation of this PLA by any other party, and no Contractor or Union shall be liable for any violation of this PLA by any other Contractor or Union.

8.5 The failure or refusal of a party to exercise its rights hereunder in one or more instances shall not be deemed a waiver of any such rights in respect of a separate instance of the same or similar nature.

[The Balance of This Page Intentionally Left Blank]

Addendum A

IDOT Slate of Permanent Arbitrators

1. Bruce Feldacker
2. Thomas F. Gibbons
3. Edward J. Harrick
4. Brent L. Motchan
5. Robert Perkovich
6. Byron Yaffee
7. Glenn A. Zipp

Execution Page

Illinois Department of Transportation

_____
Omer M. Osman, Director of Highways

_____
Michael A. Forti, Chief Counsel

_____ _____
Erica J. Borggren, Acting Secretary (Date)

Illinois AFL-CIO Statewide Project Labor Agreement Committee, representing the Unions listed below:

_____ _____
(Date)

List Unions:

****RETURN WITH BID****

Exhibit A - Contractor Letter of Assent

_____
(Date)

To All Parties:

In accordance with the terms and conditions of the contract for Construction Work on [Contract No. **72B58**], this Letter of Assent hereby confirms that the undersigned Prime Contractor or Subcontractor agrees to be bound by the terms and conditions of the Project Labor Agreement established and entered into by the Illinois Department of Transportation in connection with said Project.

It is the understanding and intent of the undersigned party that this Project Labor Agreement shall pertain only to the identified Project. In the event it is necessary for the undersigned party to become signatory to a collective bargaining agreement to which it is not otherwise a party in order that it may lawfully make certain required contributions to applicable fringe benefit funds, the undersigned party hereby expressly conditions its acceptance of and limits its participation in such collective bargaining agreement to its work on the Project.

_____
(Authorized Company Officer)

_____
(Company)

****RETURN WITH BID****

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

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.