RETURN WITH BID

State of _____)
) ss.
County of _____)

AFFIDAVIT

_____ (name of affiant), of _____,

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

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

_____
Signature

_____
Print Name of Affiant

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

_____
Notary Public

(SEAL)

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.dot.il.gov/desenv/delett.html before submitting final bid information.

IDOT IS NOT RESPONSIBLE FOR ANY E-MAIL FAILURES.

Addenda questions may be directed to the Contracts Office at (217)782-7806 or 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 suer 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 **Your bid will not be read if this is not completed.** Do not include certificates with your bid. Keep the certificates in your office in case they are requested by IDOT.

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

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

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

1W

Proposal Submitted By
Name
Address
City

Letting February 28, 2014

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

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

Illinois Department of Transportation
Springfield, Illinois 62764

ILLINOIS DEPARTMENT OF NATURAL RESOURCES
Office of Water Resources

Contract # FR435
William G. Stratton Lock & Dam
Plans For Lock & Gate Structure Improvements
Mc Henry County FR435

PLEASE MARK THE APPROPRIATE BOX BELOW:

☐ A Bid Bond is included.

☐ A Cashier's Check or a Certified Check is included

Prepared by S

Checked by

(Printed by authority of the State of Illinois)

Page intentionally left blank

RETURN WITH BID

ILLINOIS
DEPARTMENT OF
NATURAL RESOURCES
Office of Water Resources

PROPOSAL

TO THE DEPARTMENT OF NATURAL RESOURCES

1. Proposal of _____

_____

Taxpayer Identification Number (Mandatory) _____

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

1W McHenry County
FR-435
Stratton Lock & Dam – Lock & Gate Structure Improvements

The proposed project is located at the Stratton Lock & Dam in the City of McHenry, Illinois on the Fox River. The work consists of constructing: an extension of the existing lock, existing lockhouse renovation, demolition of the existing sluice gate structure, construction of a new flood control structure with hinged crest gates, installation of remote gate operation controls at the Stratton lockhouse to control the flood control gates at Algonquin, IL, restoration of the upstream right bank berm, construction of a new maintenance docking pier, and all associated site work.

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 Natural Resources and the Department of Transportation. This proposal will become part of the contract and the terms and conditions contained in the contract documents shall govern performance and payments.

RETURN WITH BID

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

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

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

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 proposals shall be made payable to the Treasurer, State of Illinois, when the state is awarding authority; the county treasurer, when a county is the awarding authority; or the city, village, or town treasurer, when a city, village, or town is the awarding authority.

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

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

Attach Cashier's Check or Certified Check Here

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

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

Item _____

Section No. _____

County _____

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

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

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

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

Schedule of Combination Bids

Combination No.	Sections Included in Combination	Combination Bid Dollars	Cents

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

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

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

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

Check box Yes ☐
Check box No ☐

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

_____

_____

RETURN WITH BID

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

SCHEDULE OF PRICES
Contract Bid Items
Contract No. FR-435

Project Name: **Stratton Lock & Dam - Lock & Gate Structure Improvements**
County: **McHenry**
Project Number / Item Number: **FR-435 / 1W**

CODE NO.	#	BID ITEM DESCRIPTION	UNIT	QUANTITY		UNIT PRICE		TOTAL PRICE	
						DOLLARS	CENTS	DOLLARS	CTS
20100110	1	Tree Removal (6 to 15 Units Diameter)	Unit	30	x		=		
20100210	2	Tree Removal (Over 15 Units Diameter)	Unit	186	x		=		
20101100	3	Tree Trunk Protection	Each	7	x		=		
20200100	4	Earth Excavation	Cu Yd	325	x		=		
20201200	5	Removal and Disposal of Unsuitable Material	Cu Yd	8,615	x		=		
20300100	6	Channel Excavation	Cu Yd	1,315	x		=		
20400800	7	Furnished Excavation	Cu Yd	1,180	x		=		
20700220	8	Porous Granular Embankment	Cu Yd	8,748	x		=		
21101505	9	Topsoil Excavation and Placement	Cu Yd	381	x		=		
21101615	10	Topsoil Furnish and Place, 4"	Sq Yd	3,025	x		=		
25000100	11	Seeding, Class 1	Acre	8.00	x		=		
25000300	12	Seeding, Class 3	Acre	2.50	x		=		
25100115	13	Mulch, Method 2	Acre	8.00	x		=		
28100201	14	Stone Riprap, Class A1	Ton	2,020	x		=		
28100207	15	Stone Riprap, Class A4	Ton	1,160	x		=		

RETURN WITH BID

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

SCHEDULE OF PRICES
Contract Bid Items
Contract No. FR-435

Project Name: **Stratton Lock & Dam - Lock & Gate Structure Improvements**
County: **McHenry**
Project Number / Item Number: **FR-435 / 1W**

CODE NO.	#	BID ITEM DESCRIPTION	UNIT	QUANTITY		UNIT PRICE		TOTAL PRICE	
						DOLLARS	CENTS	DOLLARS	CTS
28100209	16	Stone Riprap, Class A5	Ton	3,240	x		=		
28200200	17	Filter Fabric	Sq Yd	6,365	x		=		
35100100	18	Aggregate Base Course, Type A	Ton	3,034	x		=		
35101400	19	Aggregate Base Course, Type B	Ton	21	x		=		
40600100	20	Bituminous Materials (Prime Coat)	Gallon	2,080	x		=		
40603080	21	Hot-Mix Asphalt Binder Course, IL-19.0, N50	Ton	470	x		=		
40603310	22	Hot-Mix Asphalt Surface Course, Mix "C", N50	Ton	350	x		=		
42400100	23	Portland Cement Concrete Sidewalk 4 Inch	Sq Ft	641	x		=		
42400300	24	Portland Cement Concrete Sidewalk 6 Inch	Sq Ft	3,958	x		=		
42400800	25	Detectable Warnings	Sq Ft	212	x		=		
44000159	26	Hot-Mix Asphalt Surface Removal, 2 1/2"	Sq Yd	4,116	x		=		
44000600	27	Sidewalk Removal	Sq Ft	1,132	x		=		
50100300	28	Removal of Existing Structures No. 1	Each	1	x		=		
50100400	29	Removal of Existing Structures No. 2	Each	1	x		=		
50200100	30	Structure Excavation	Cu Yd	11	x		=		

RETURN WITH BID

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

SCHEDULE OF PRICES
Contract Bid Items
Contract No. FR-435

Project Name: **Stratton Lock & Dam - Lock & Gate Structure Improvements**
County: **McHenry**
Project Number / Item Number: **FR-435 / 1W**

CODE NO.	#	BID ITEM DESCRIPTION	UNIT	QUANTITY		UNIT PRICE		TOTAL PRICE	
						DOLLARS	CENTS	DOLLARS	CTS
50200300	31	Cofferdam Excavation	Cu Yd	1,843	x		=		
50300225	32	Concrete Structures	Cu Yd	2,430.9	x		=		
50500405	33	Furnishing and Erecting Structural Steel	Pound	205,540	x		=		
50500505	34	Stud Shear Connectors	Each	384	x		=		
50700105	35	Treated Timber	F.B.M.	3,833	x		=		
50800105	36	Reinforcement Bars	Pound	295,820	x		=		
50800515	37	Bar Splicers	Each	120	x		=		
50900805	38	Pedestrian Railing	Foot	619	x		=		
50901760	39	Pipe Handrail	Foot	356.0	x		=		
51200510	40	Furnishing Treated Piles 20.1 to 38 feet	Foot	231	x		=		
51200957	41	Furnishing Metal Shell Piles 12" x 0.250"	Foot	9,336	x		=		
51202305	42	Driving Piles	Foot	9,567	x		=		
51203200	43	Test Pile Metal Shells	Each	4	x		=		
51204650	44	Pile Shoes	Each	246	x		=		
59300100	45	Controlled Low-Strength Material	Cu Yd	131	x		=		

RETURN WITH BID

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

SCHEDULE OF PRICES
Contract Bid Items
Contract No. FR-435

Project Name: **Stratton Lock & Dam - Lock & Gate Structure Improvements**
County: **McHenry**
Project Number / Item Number: **FR-435 / 1W**

CODE NO.	#	BID ITEM DESCRIPTION	UNIT	QUANTITY		UNIT PRICE		TOTAL PRICE	
						DOLLARS	CENTS	DOLLARS	CTS
60223800	46	Manholes, Type A, 6'-Diameter, Type 1 Frame, Closed Lid	Each	4	x		=		
63000001	47	Steel Plate Beam Guardrail, Type A, 6 Foot Posts	Foot	175	x		=		
66400105	48	Chain Link Fence, 4'	Foot	235	x		=		
66405600	49	Chain Link Gates, 4' x 8' Double	Each	1	x		=		
67000500	50	Engineer's Field Office, Type B	Cal Mo	30	x		=		
67100100	51	Mobilization	L Sum	1	x		=		
78001100	52	Paint Pavement Marking - Letters and Symbols	Sq Ft	5	x		=		
78001110	53	Paint Pavement Marking - Line 4"	Foot	290	x		=		
X5121800	54	Permanent Steel Sheet Piling	Sq Ft	27,621	x		=		
Z0007101	55	Containment and Disposal of Lead Paint Cleaning Residues No. 1	L Sum	1	x		=		
Z0007102	56	Containment and Disposal of Lead Paint Cleaning Residues No. 2	L Sum	1	x		=		
Z0007124	57	Steel Railing (Special)	Foot	196.5	x		=		
Z0012754	58	Structural Repair of Concrete (Depth Equal To Or Less Than 5 Inches)	Sq Ft	90	x		=		
Z0012755	59	Structural Repair of Concrete (Depth Greater Than 5 Inches)	Sq Ft	225	x		=		
Z0065200	60	Shot Rock	Ton	1,625	x		=		

RETURN WITH BID

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

SCHEDULE OF PRICES
Contract Bid Items
Contract No. FR-435

Project Name: **Stratton Lock & Dam - Lock & Gate Structure Improvements**
County: **McHenry**
Project Number / Item Number: **FR-435 / 1W**

CODE NO.	#	BID ITEM DESCRIPTION	UNIT	QUANTITY		UNIT PRICE		TOTAL PRICE	
						DOLLARS	CENTS	DOLLARS	CTS
Z0075400	61	Tie Rods	Each	29	x		=		
NR000900	62	Boiler Demolition	L Sum	1	x		=		
NR506001	63	Cleaning and Painting Existing Miter Gate Steel	L Sum	1	x		=		
NR506002	64	Cleaning and Painting Existing Steel Sheet Piling	L Sum	1	x		=		
NR502001	65	Cofferdam - Location 1	Each	1	x		=		
NR502002	66	Cofferdam - Location 2	Each	1	x		=		
NR502003	67	Cofferdam - Location 3	Each	1	x		=		
NR502004	68	Cofferdam - Location 4	Each	1	x		=		
NR502005	69	Cofferdam - Location 5	Each	1	x		=		
NR502011	70	Cofferdam Restoration - Location 1	Each	1	x		=		
NR502012	71	Cofferdam Restoration - Location 2	Each	1	x		=		
NR502013	72	Cofferdam Restoration - Location 3	Each	1	x		=		
NR502014	73	Cofferdam Restoration - Location 4	Each	1	x		=		
NR502015	74	Cofferdam Restoration - Location 5	Each	1	x		=		
NR201001	75	Construction Fence	L Sum	1	x		=		

RETURN WITH BID

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

SCHEDULE OF PRICES
Contract Bid Items
Contract No. FR-435

Project Name: **Stratton Lock & Dam - Lock & Gate Structure Improvements**
County: **McHenry**
Project Number / Item Number: **FR-435 / 1W**

CODE NO.	#	BID ITEM DESCRIPTION	UNIT	QUANTITY		UNIT PRICE		TOTAL PRICE	
						DOLLARS	CENTS	DOLLARS	CTS
NR105000	76	Construction Layout	L Sum	1	x		=		
NR000800	77	Dam Controls Process Air System Modifications	L Sum	1	x		=		
NR000801	78	Dam Control System	L Sum	1	x		=		
NR280000	79	Erosion Control System	L Sum	1	x		=		
NR201003	80	Fence Removal	L Sum	1	x		=		
NR000802	81	Fixed Access Ladder	Each	3	x		=		
NR000803	82	Gate Structure - Doors	L Sum	1	x		=		
NR000804	83	Gate Structure - Electrical Work	L Sum	1	x		=		
NR000805	84	Gate Structure - Fire Extinguishers	L Sum	1	x		=		
NR000806	85	Gate Structure - Floor Access Doors and Frames	Each	3	x		=		
NR000807	86	Gate Structure - Insulation	L Sum	1	x		=		
NR000808	87	Gate Structure - Mechanical Work (HVAC)	L Sum	1	x		=		
NR000809	88	Gate Structure - Painting	L Sum	1	x		=		
NR000810	89	Gate Structure - Plumbing Work	L Sum	1	x		=		
NR000811	90	Gate Structure - Roof	L Sum	1	x		=		

RETURN WITH BID

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

SCHEDULE OF PRICES
Contract Bid Items
Contract No. FR-435

Project Name: **Stratton Lock & Dam - Lock & Gate Structure Improvements**
County: **McHenry**
Project Number / Item Number: **FR-435 / 1W**

CODE NO.	#	BID ITEM DESCRIPTION	UNIT	QUANTITY		UNIT PRICE		TOTAL PRICE	
						DOLLARS	CENTS	DOLLARS	CTS
NR000812	91	Gate Structure - Rough Carpentry	L Sum	1	x		=		
NR000813	92	Gate Structure - Windows	Each	3	x		=		
NR000814	93	Hand Compacted Earth Fill	Cu Yd	1,140	x		=		
NR000815	94	HDPE Pipe, SDR 17, 32"	Foot	100	x		=		
NR000816	95	HDPE Pipe, SDR 17, 36"	Foot	90	x		=		
NR000817	96	HDPE Pipe, SDR 32.5, 36"	Foot	133	x		=		
NR000818	97	Hinged Crest Gates	L Sum	1	x		=		
NR000819	98	Landscaping	L Sum	1	x		=		
NR000820	99	Lock Control System	L Sum	1	x		=		
NR000821	100	Lock Gate Machinery	L Sum	1	x		=		
NR000822	101	Lock Gate Rehabilitation - Gate Anchorage Linkage Assemblies	Each	4	x		=		
NR000823	102	Lock Gate Rehabilitation - General Lower Gate	L Sum	1	x		=		
NR000824	103	Lock Gate Rehabilitation - General Upper Gate	L Sum	1	x		=		
NR000825	104	Lock Gate Rehabilitation - Lower Gate Anchorage Assemblies	Each	4	x		=		
NR000826	105	Lock Gate Rehabilitation - Lower Gate Quoin Post	Foot	36	x		=		

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CODE NO.	#	BID ITEM DESCRIPTION	UNIT	QUANTITY		UNIT PRICE		TOTAL PRICE	
						DOLLARS	CENTS	DOLLARS	CTS
NR000827	106	Lock Gate Rehabilitation - Lower Gate Railing Modifications	L Sum	1	x		=		
NR000828	107	Lock Gate Rehabilitation - Miter Sill Seal	Foot	40	x		=		
NR000829	108	Lock Gate Rehabilitation - Miter/Quoin/Bearing Retrofit	L Sum	1	x		=		
NR000830	109	Lock Gate Rehabilitation - Upper Gate Railing Modifications	L Sum	1	x		=		
NR000831	110	Lock Gate Unidentified Steel Repairs - 5/16" Fillet Weld	Inch	1,000	x		=		
NR000832	111	Lock Gate Unidentified Steel Repairs - Complete Joint Penetration Weld	Inch	50	x		=		
NR000833	112	Lock Gate Unidentified Steel Repairs - Field Drill and Install H.S. Bolt	Each	20	x		=		
NR000834	113	Lock Gate Unidentified Steel Repairs - Plate or Rolled Shape Fabrications	Pound	400	x		=		
NR000835	114	Lock Gate Unidentified Steel Repairs - Remove Rivet, Install H.S. Bolt	Each	20	x		=		
NR000836	115	Lock Gate Unidentified Steel Repairs - Replace Pintle Lower Part	Each	2	x		=		
NR000837	116	Lock Grating and Covers	L Sum	1	x		=		
NR000838	117	Lock Mooring Cables	L Sum	1	x		=		
NR000839	118	Lock Plumbing Work	L Sum	1	x		=		
NR000840	119	Lock Steel Piping - Diffuser System	L Sum	1	x		=		
NR000841	120	Lock Steel Piping - Existing Lock Monoliths	L Sum	1	x		=		

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CODE NO.	#	BID ITEM DESCRIPTION	UNIT	QUANTITY		UNIT PRICE		TOTAL PRICE	
						DOLLARS	CENTS	DOLLARS	CTS
NR000842	121	Lock Steel Piping - Intake Structure	L Sum	1	x		=		
NR000843	122	Lock Steel Piping - New Lock Monoliths	L Sum	1	x		=		
NR000844	123	Lockhouse - Brick Restoration and Cleaning	L Sum	1	x		=		
NR000845	124	Lockhouse - Doors	L Sum	1	x		=		
NR000846	125	Lockhouse - Electrical Work	L Sum	1	x		=		
NR000847	126	Lockhouse - Fire Extinguishers	L Sum	1	x		=		
NR000848	127	Lockhouse - Flooring	L Sum	1	x		=		
NR000849	128	Lockhouse - Gypsum Board Assemblies	L Sum	1	x		=		
NR000850	129	Lockhouse - Interior Spray Foam Insulation	L Sum	1	x		=		
NR000851	130	Lockhouse - Mechanical Work (HVAC)	L Sum	1	x		=		
NR000852	131	Lockhouse - Millwork	L Sum	1	x		=		
NR000853	132	Lockhouse - Painting	L Sum	1	x		=		
NR000854	133	Lockhouse - Plumbing Work	L Sum	1	x		=		
NR000855	134	Lockhouse - Restroom Accessories	L Sum	1	x		=		
NR000856	135	Lockhouse - Roof	L Sum	1	x		=		

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CODE NO.	#	BID ITEM DESCRIPTION	UNIT	QUANTITY		UNIT PRICE		TOTAL PRICE	
						DOLLARS	CENTS	DOLLARS	CTS
NR000857	136	Lockhouse - Rough Carpentry	L Sum	1	x		=		
NR000858	137	Lockhouse - Selective Demolition	L Sum	1	x		=		
NR000859	138	Lockhouse - Windows	Each	6	x		=		
NR000860	139	Lower Quoin Post Bearings	Foot	36	x		=		
NR000861	140	North Berm Embankment Tree and Vegetation Removal	Acre	2.1	x		=		
NR000862	141	Parking Block Removal and Replacement	L Sum	1	x		=		
NR000863	142	Portable Davit Crane	L Sum	1	x		=		
NR000864	143	Railing Removal	Foot	310	x		=		
NR000865	144	Replace Lock Gate Gudgeon Assembly	Each	4	x		=		
NR000866	145	Replace Lower Lock Gate Pintle Assembly	Each	2	x		=		
NR000867	146	Replace Upper Lock Gate Pintle Assembly	Each	2	x		=		
NR202001	147	Riprap Removal	Sq Yd	2,210	x		=		
NR000868	148	Rustic Fence	L Sum	1	x		=		
NR664001	149	Security Fence Gate, 6'x10' Double Swing	Each	4	x		=		
NR664002	150	Security Fence Gate, 6'x4' Single	Each	2	x		=		

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CODE NO.	#	BID ITEM DESCRIPTION	UNIT	QUANTITY		UNIT PRICE		TOTAL PRICE	
						DOLLARS	CENTS	DOLLARS	CTS
NR664003	151	Security Fence, 6'	Foot	910	x		=		
NR720000	152	Signs	L Sum	1	x		=		
NR720010	153	Signs Removal and Replacement	L Sum	1	x		=		
NR000910	154	Site Demolition	L Sum	1	x		=		
NR801000	155	Site Electrical System	L Sum	1	x		=		
NR607024	156	Sluice Gate, Heavy, 24" x 24"	Each	4	x		=		
NR607030	157	Sluice Gate, Heavy, 30" x 30"	Each	2	x		=		
NR607036	158	Sluice Gate, Heavy, 36" x 36"	Each	3	x		=		
NR281100	159	Stone Riprap, Special	Ton	1,820	x		=		
NR000869	160	Stop Logs - Gate Structure	L Sum	1	x		=		
NR000870	161	Stop Logs - Intake Structure	L Sum	1	x		=		
NR000871	162	Stop Logs - Lock	L Sum	1	x		=		
NR000872	163	Temporary Boat Traffic Control and Channel Restoration	L Sum	1	x		=		
NR201002	164	Temporary Fence	L Sum	1	x		=		
NR701001	165	Temporary Signing	L Sum	1	x		=		

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CODE NO.	#	BID ITEM DESCRIPTION	UNIT	QUANTITY		UNIT PRICE			TOTAL PRICE	
						DOLLARS	CENTS		DOLLARS	CTS
NR000873	166	Trash Rack - Intake Structure	L Sum	1	x			=		
NR000874	167	Warning Cable and Mounting System	L Sum	1	x			=		
						BID TOTAL				

NOTE:

1. Each pay item should have a unit price and a total price.
2. The unit price shall govern if no total price is shown or if there is a discrepancy between the product of the unit price multiplied by the quantity.
3. If a unit price is omitted, the total price will be divided by the quantity in order to establish a unit price.
4. A bid will be declared unacceptable if neither a unit price nor a total is shown.

Bidder's (Firm) Name _____

Address _____ Telephone No. _____

_____ Signed this _____ day of

By _____ _____, 20_____.

(Title)

RETURN WITH BID

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

I. GENERAL

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

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

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

☐ I acknowledge, understand and accept these terms and conditions.

II. ASSURANCES

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

A. Conflicts of Interest

Section 50-13. Conflicts of Interest.

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

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

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

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

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

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

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

B. Negotiations

Section 50-15. Negotiations.

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

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

C. Inducements

Section 50-25. Inducement.

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

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

D. Revolving Door Prohibition

Section 50-30. Revolving door prohibition.

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

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

E. Reporting Anticompetitive Practices

Section 50-40. Reporting anticompetitive practices.

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

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

F. Confidentiality

Section 50-45. Confidentiality.

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

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

G. Insider Information

Section 50-50. Insider information.

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

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

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

III. CERTIFICATIONS

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

A. Bribery

Section 50-5. Bribery.

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

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

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

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

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

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

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

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

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

B. Felons

Section 50-10. Felons.

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

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

C. Debt Delinquency

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

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

D. Prohibited Bidders, Contractors and Subcontractors

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

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

E. Section 42 of the Environmental Protection Act

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

F. Educational Loan

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

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

G. Bid-Rigging/Bid Rotating

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

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

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

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

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

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

H. International Anti-Boycott

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

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

I. Drug Free Workplace

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

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

J. Disclosure of Business Operations in Iran

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

(1) More than 10% of the Company's revenues produced in or assets located in Iran involve oil-related activities or mineral-extraction activities; less than 75% of the Company's revenues produced in or assets located in Iran involve contracts with or provision of oil-related or mineral-extraction products or services to the Government of Iran or a project or consortium created exclusively by that government; and the Company has failed to take substantial action.

(2) The Company has, on or after August 5, 1996, made an investment of $20 million or more, or any combination of investments of at least $10 million each that in the aggregate equals or exceeds $20 million in any 12-month period, which directly or significantly contributes to the enhancement of Iran's ability to develop petroleum resources of Iran.

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

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

Check the appropriate statement:

/___/ Company has no business operations in Iran to disclose.

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

RETURN WITH BID

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

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

_____

_____

_____

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

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

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

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

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

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

M. Lobbyist Disclosure

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

(i) Disclose all costs, fees, compensation, reimbursements, and other remunerations paid or to be paid to the lobbyist related to the contract,

(ii) Not bill or otherwise cause the State of Illinois to pay for any of the lobbyist's costs, fees, compensation, reimbursements, or other remuneration, and

(iii) Sign a verification certifying that none of the lobbyist's costs, fees, compensation, reimbursements, or other remuneration were billed to the State.

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

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

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

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

Or

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

Name and address of person: _____

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

_____

_____

_____

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

IV. DISCLOSURES

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

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

B. Financial Interests and Conflicts of Interest

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

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

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

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

C. Disclosure Form Instructions

Form A Instructions for Financial Information & Potential Conflicts of Interest

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

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

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

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

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

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

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

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

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

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

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

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

RETURN WITH BID

ILLINOIS DEPARTMENT OF TRANSPORTATION

Form A
Financial Information & Potential Conflicts of Interest Disclosure

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

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

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

DISCLOSURE OF FINANCIAL INFORMATION

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

FOR INDIVIDUAL (type or print information)

NAME: _____

ADDRESS _____

_____

Type of ownership/distributable income share:

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

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

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

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

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

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

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

3. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor?
   Yes ___No __

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

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

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

1. Is your spouse or any minor children currently an officer or employee of the Capitol Development Board or the Illinois State Toll Highway Authority? Yes ___No __

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

3. If your spouse or any minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 71/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor? Yes ___No __

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

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

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

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

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

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

(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): _____

_____

_____

_____

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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.

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ILLINOIS DEPARTMENT OF TRANSPORTATION

Form B
Other Contracts & Financial Related Information Disclosure

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

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

DISCLOSURE OF OTHER CONTRACTS AND PROCUREMENT RELATED INFORMATION

1. Identifying Other Contracts & Procurement Related Information. The BIDDER shall identify whether it has any pending contracts (including leases), bids, proposals, or other ongoing procurement relationship with any other State of Illinois agency: Yes ___ No __
If "No" is checked, the bidder only needs to complete the signature box on the bottom of this page.

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

THE FOLLOWING STATEMENT MUST BE CHECKED

☐ _____ _____
Signature of Authorized Representative Date

OWNERSHIP CERTIFICATION

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

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

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

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TAXPAYER IDENTIFICATION NUMBER

I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. person (including a U.S. resident alien).

- *If you are an individual, enter your name and SSN as it appears on your Social Security Card.*
- *If you are a sole proprietor, enter the owner's name on the name line followed by the name of the business and the owner's SSN or EIN.*
- *If you are a single-member LLC that is disregarded as an entity separate from its owner, enter the owner's name on the name line and the d/b/a on the business name line and enter the owner's SSN or EIN.*
- *If the LLC is a corporation or partnership, enter the entity's business name and EIN and for corporations, attach IRS acceptance letter (CP261 or CP277).*
- *For all other entities, enter the name of the entity as used to apply for the entity's EIN and the EIN.*

Name: _____

Business Name: _____

Taxpayer Identification Number:

Social Security Number _____

or

Employer Identification Number _____

Legal Status (*check one*):

- ☐ Individual
- ☐ Sole Proprietor
- ☐ Partnership
- ☐ Legal Services Corporation
- ☐ Tax-exempt
- ☐ Corporation providing or billing medical and/or health care services
- ☐ Corporation NOT providing or billing medical and/or health care services
- ☐ Governmental
- ☐ Nonresident alien
- ☐ Estate or trust
- ☐ Pharmacy (Non-Corp.)
- ☐ Pharmacy/Funeral Home/Cemetery (Corp.)
- ☐ Limited Liability Company (select applicable tax classification)
  - ☐ D = disregarded entity
  - ☐ C = corporation
  - ☐ P = partnership

Signature: _____ **Date:** _____

RETURN WITH BID

SPECIAL NOTICE TO CONTRACTORS

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

CONSTRUCTION EMPLOYEE UTILIZATION PROJECTION

(a) All bidders on construction contracts shall complete and submit, along with and as part of their bids, a Bidder's Employee Utilization Form (Form BC-1256) setting forth a projection and breakdown of the total workforce intended to be hired and/or allocated to such contract work by the bidder including a projection of minority and female employee utilization in all job classifications on the contract project.

(b) The Department of Transportation shall review the Employee Utilization Form, and workforce projections contained therein, of the contract awardee to determine if such projections reflect an underutilization of minority persons and/or women in any job classification in accordance with the Equal Employment Opportunity Clause and Section 7.2 of the Illinois Department of Human Rights' Rules and Regulations for Public Contracts adopted as amended on September 17, 1980. If it is determined that the contract awardee's projections reflect an underutilization of minority persons and/or women in any job classification, it shall be advised in writing of the manner in which it is underutilizing and such awardee shall be considered to be in breach of the contract unless, prior to commencement of work on the contract project, it submits revised satisfactory projections or an acceptable written affirmative action plan to correct such underutilization including a specific timetable geared to the completion stages of the contract.

(c) The Department of Transportation shall provide to the Department of Human Rights a copy of the contract awardee's Employee Utilization Form, a copy of any required written affirmative action plan, and any written correspondence related thereto. The Department of Human Rights may review and revise any action taken by the Department of Transportation with respect to these requirements.

RETURN WITH BID

Illinois Department of Transportation

PART I. IDENTIFICATION

Dept. Human Rights #_____ Duration of Project: _____

Name of Bidder: _____

PART II. WORKFORCE PROJECTION

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

TABLE A

TOTAL Workforce Projection for Contract													TABLE B: CURRENT EMPLOYEES TO BE ASSIGNED TO CONTRACT			
			MINORITY EMPLOYEES						TRAINEES							
JOB CATEGORIES	TOTAL EMPLOYEES		BLACK		HISPANIC		*OTHER MINOR.		APPREN-TICES		ON THE JOB TRAINEES		TOTAL EMPLOYEES		MINORITY EMPLOYEES	
	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								

FOR DEPARTMENT USE ONLY

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

BC 1256 (Rev. 12/11/07)

Note: See instructions on page 2

PART II. WORKFORCE PROJECTION - continued

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

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

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

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

PART III. AFFIRMATIVE ACTION PLAN

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

B. The undersigned bidder understands and agrees that the minority and female employee utilization projection submitted herein, and the goals and timetable included under an Affirmative Action Plan if required, are deemed to be part of the contract specifications.

Company _____ Telephone Number _____

_____

Address _____

NOTICE REGARDING SIGNATURE

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

Signature: ☐ _____ Title: _____ Date: _____

Instructions: All tables must include subcontractor personnel in addition to prime contractor personnel.

Table A - Include both the number of employees that would be hired to perform the contract work and the total number currently employed (Table B) that will be allocated to contract work, and include all apprentices and on-the-job trainees. The "Total Employees" column should include all employees including all minorities, apprentices and on-the-job trainees to be employed on the contract work.

Table B - Include all employees currently employed that will be allocated to the contract work including any apprentices and on-the-job trainees currently employed.

Table C - Indicate the racial breakdown of the total apprentices and on-the-job trainees shown in Table A.

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

RETURN WITH BID

PROPOSAL SIGNATURE SHEET

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

Firm Name _____

(IF AN INDIVIDUAL) Signature of Owner _____

Business Address _____

_____

Firm Name _____

By _____

(IF A CO-PARTNERSHIP) Business Address _____

_____

Name and Address of All Members of the Firm:

_____ _____

Corporate Name _____

By _____

Signature of Authorized Representative

_____

Typed or printed name and title of Authorized Representative

(IF A CORPORATION)

Attest _____

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

_____

Typed or printed name and title of Authorized Representative

(IF A JOINT VENTURE)

Attest _____

Signature

Business Address _____

_____

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

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.

RETURN WITH BID

ILLINOIS
DEPARTMENT OF
NATURAL RESOURCES
Office of Water Resources

Proposal Bid Bond

William G. Stratton Lock & Dam
Lock & Gate Structure Improvements
Mc Henry County FR-435

Item No. 1W
Letting Date February 28, 2014

KNOW ALL MEN 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 _____ Letting _____

Participation Statement Item No. _____

(1) Instructions Contract _____

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

(2) Work

Pay Item No.	Description	Quantity	Unit Price	Total
			Total	

(3) Partial Payment Items
For any of the above items which are partial pay items, specifically describe the work and subcontract dollar amount:

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

_____ _____
Signature for Prime Contractor Signature for DBE Firm

Title _____ Title _____

Date _____ Date _____

Contact _____ Contact _____

Phone _____ Phone _____

Firm Name _____ Firm Name _____

Address _____ Address _____

City/State/Zip _____ City/State/Zip _____

E _____

WC _____

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

ILLINOIS DEPARTMENT OF NATURAL RESOURCES
STANDARD PROJECT LABOR AGREEMENT

This Agreement is entered into this _____day of _____ , 2014, by and between the **Illinois Department of Natural Resources (IDNR)** and the **AFL-CIO Project Labor Agreement Committee (PLA Committee)** for and on behalf of its affiliated members, hereinafter referred to individually and collectively, as the "Union". This Agreement shall apply to work performed by the Employer and its Contractors and Subcontractors on Construction known as the **IDNR Project No. FR-435, William G. Stratton Lock & Dam, Plans for Lock & Gate Structure Improvements, McHenry, County located in McHenry, Illinois.**

ARTICLE 1 - INTENT AND PURPOSES

1.1 It is mutually understood that the following terms and conditions relating to employment of workmen covered by this Agreement have been written in order to promote efficiency of construction operations and provide for peaceful settlement of labor disputes without strikes or lockouts, thereby promoting the public interest in assuring the timely and economical completion of the work. It is also the intent of the parties to set out standard working conditions for the efficient prosecution of said construction work, herein to establish and maintain harmonious relations between all parties of the Agreement, to secure optimum productivity and to eliminate strikes, lockouts, or delays in the prosecution of the work.

(a) Therefore, the following provisions will be binding upon the Contractor and all its sub-contractors (hereinafter jointly referred to as "Contractor"), who shall be required to sign the "Participation Agreement", attached hereto as "Schedule A", and the Unions during the term of this Agreement and any renewal thereafter. The Unions hereby consent to apply the terms and conditions of this Project Agreement to said sub-contractors upon their signing the "Participation Agreement". It is understood that each sub-contractor will be considered and accepted by the Unions as a separate employer for the purposes of collective bargaining. It is further agreed that the employees working under this Agreement shall constitute a bargaining unit separate and distinct from all others. This Agreement may be modified by mutual consent in writing by the signatory parties hereto.

1.2 The Contractor agrees to be bound by the terms of the Collective Bargaining Agreements and amendments (CBA) thereto of the affiliates of the PLA Committee and the applicable employers association, if any. Such agreements are incorporated herein by reference. In order to comply with the requirements of the various fringe benefit funds to which the Contractor is to contribute, the Contractor shall sign such participation agreements as are necessary. Upon written notice from any fringe benefit fund IDNR will withhold payment of delinquencies occurring on this project from the involved Prime Contractors.

1.3 It is mutually understood that where the provisions of this Agreement are at variance with any other agreement between the Contractor and the Union, the language of this Agreement shall prevail.

1.4 The Contractor and the Union agree that should the Collective Bargaining Agreement (CBA) of any PLA Committee affiliates signatory to this Agreement expire prior to the completion of this project, the expired contracts' terms will be maintained until a new CBA is ratified. The wages, and fringe benefits included in any new CBA will be effective on the effective date of the newly negotiated CBA unless wage and fringe benefit retroactivity is agreed upon by the bargaining parties.

ARTICLE II - RECOGNITION

2.1 The Contractor recognizes the PLA Committee and the signatory affiliates as the sole and exclusive bargaining representatives for its craft employees employed on the jobsite. PLA Committee affiliates signatory to this Agreement will have recognition on the project for their craft.

ARTICLE III - ADMINISTRATION OF AGREEMENT

3.1 In order to assure that all parties have a clear understanding of the Agreement, to promote harmony and address potential problems, a pre-job conference will be held with the Contractor, PLA Committee Representatives and all signatory parties prior to the start of any work on the project.

3.2 Representatives of the Contractor and the Unions shall meet as required but not less than once a month to review the operation of this Agreement. The representatives at this meeting shall be empowered to resolve any dispute over the intent and application of the Agreement.

3.3 The Contractor shall make available in writing to the Unions and Council no less than one week prior to these meetings a job status report, planned activities for the next 30 day period, actual numbers of craft employees on the project and estimated numbers of employees by craft required for the next 30 day period. The purpose of this report is to allow time to address any potential jurisdictional problems and to ensure that no party signatory to the Agreement is hindering the continuous progress of the project through a lack of planning or shortage of manpower.

ARTICLE IV - HOURS OF WORK OVERTIME SHIFTS & HOLIDAYS

4.1 The standard work day shall be an established consecutive eight (8) hour period between the hours of 7:00 a.m. and 5:00 p.m. with one-half hour designated as unpaid period for lunch. The standard work week shall be five (5) consecutive days of work commencing on Monday. Starting time which is to be established at the pre-job conference will be applicable to all craft employees on the project. Should job conditions dictate a change in the established starting time and/or a staggered lunch period on certain work of the project or with individual crafts, the Contractor, Business Managers of the crafts involved and the PLA Committee shall mutually agree to such changes. If work schedule change cannot be mutually agreed to between these parties, the hours fixed in the Agreement shall prevail.

4.2 All time before and after the established work day of eight (8) hours, Monday through Friday and all time on Saturday shall be paid in accordance with each crafts current collective bargaining agreement. All time on Sundays and Holidays shall be paid for at the rate of double time.

(a) Fringe benefit payments for all overtime work shall be paid in accordance with each craft's Current collective Bargaining Agreement.

4.3 Shift work, if used, shall be as provided in the collective bargaining agreement of each affected craft.

4.4 Recognized Holidays shall be as follows: New Year's Day, Memorial Day, Fourth of July, Labor Day, Veterans Day (to be celebrated the day after Thanksgiving), Thanksgiving Day and Christmas Day. No work will be performed on Labor Day under any consideration, except in an extreme emergency and then only after consent is given by the Business Manager.

ARTICLE V - ABSENTEEISM

5.1 The Contractor and the Union agree that the chronic and/or unexcused absenteeism is undesirable and must be controlled. Employees that develop a record of such absenteeism shall be identified by the Contractor to the appropriate referral facility and the Contractor shall support such action with the work record of the involved employee. Any employee terminated for such absenteeism shall not be eligible for rehire on the project for a period of no less than ninety (90) days.

ARTICLE VI - MANAGEMENT RIGHTS

6.1 The Contractor retains and shall exercise full and exclusive authority and responsibility for the management of its operations, except as expressly limited by the terms of this Agreement and the Unions collective bargaining agreement.

ARTICLE VII - GENERAL WORKING CONDITIONS

7.1 Employment begins and ends at the project site, to be determined at the Pre-Job Conference.

7.2 Employees shall be at their place of work at the starting time and shall remain at their place of work until quitting time. The parties reaffirm their policy of a fair days work for a fair days pay.

7.3 The Contractor may utilize brassing, or other systems to check employees in and out. Should such procedures be required, the techniques and rules regarding such procedures shall be established by mutual consent of the parties at the pre-job conference.

7.4 There shall be no limit on production by workmen or restrictions on the full use of tools or equipment. Craftsmen using tools shall perform any work of their trade and shall work under the direction of the craft foreman. There shall be no restrictions on efficient use of manpower other than as may be required by safety regulations.

7.5 Crew Foreman shall be utilized as per the existing collective bargaining agreements. The Contractor agrees to allow crew foremen ample time to direct and supervise their crew. The Union agrees there will be no restrictions placed on crew foreman's ability to handle tools and materials.

7.6 The Contractor may utilize the most efficient methods or techniques of construction, tools or other labor saving devices to accomplish the work. Practices not a part of the terms and conditions of this Agreement will not be recognized.

7.7 Should overtime work be required, the Contractor will have the right to assign specific employees and/or crews to perform such overtime work as is necessary to accomplish the work.

7.8 The Contractor may establish such reasonable project rules as the Contractor deems appropriate. These rules will be reviewed and established at the pre-job conference and posted at the project site by the Contractor.

7.9 It is recognized that specialized or unusual equipment may be installed on the project and in such cases, the Union recognizes the right of the Contractor to involve the equipment supplier or vendor's personnel in supervising the setting of the equipment, making modifications and final alignment which may be necessary prior to and during the start-up procedure, in order to protect factory warranties.

7.10 In order to promote a harmonious relationship between the equipment or vendor's personnel and the Building Trades craftsmen, a meeting shall be held between the Contractor and the Unions prior to any involvement on the project by these personnel. The Contractor will inform the Unions of the nature of involvement by these personnel and the numbers of personnel to be involved, allowing ample time for the Union representatives to inform their stewards prior to the start of any work.

ARTICLE VIII - SAFETY

8.1 The employees covered by the terms of this Agreement shall at all times while in the employ of the Contractor be bound by the safety rules and regulations as established by the Contractor in accordance with the Construction Safety Act and OSHA.

(a) These rules and regulations will be published and posted at conspicuous places throughout the project.

8.2 In accordance with the requirements of OSHA, it shall be the exclusive responsibility of each Contractor on a jobsite to which this Agreement applies, to assure safe working conditions for its employees and compliance by them with any safety rules contained herein or established by the Contractor. Nothing in this Agreement will make the PLA Committee or any of its affiliates liable to any employees or to other persons in the event that injury or accident occurs.

ARTICLE IX - SUBCONTRACTING

9.1 The Contractor agrees that neither he nor any of his subcontractors will subcontract any work to be done on the project except to a person, firm or corporation party signatory to this Agreement.

9.2 Any Contractor or Sub-contractor working on the project covered by this Agreement shall as a condition to working on said project, become signatory to and perform all work under the terms of this Agreement. The furnishing of materials, supplies or equipment and the delivery thereof shall be in no case considered subcontracting.

ARTICLE X - UNION REPRESENTATION

10.1 Authorized representatives of the PLA Committee and its signatory affiliates shall have access to the project provided they do not interfere with the work of the employees and further provided that such representatives fully comply with the visitor and security rules established for the project.

10.2 Each PLA Committee affiliate which is a party to this Agreement shall have the right to designate a working journeyman as a steward. Such designated steward shall be a qualified worker performing the work of that craft and shall not exercise any supervisory functions. Each steward shall be concerned with the employees of the steward's employer and not with the employees of any other employer.

10.3 The working steward will be paid at the applicable wage rate for the job classification in which he is employed.

10.4 The working steward shall not be discriminated against because of his activities in performing his duties as steward, and except as otherwise provided in local agreements, shall be the last employee in his craft to be laid off in any reduction in force. Stewards will be subject to discharge to the same extent that other employees are only after notification to the Union Representative. The Contractor will permit stewards sufficient time to perform the duties inherent to a steward's responsibilities. Stewards will be offered available overtime work if qualified.

ARTICLE XI - GRIEVANCE AND ARBITRATION PROCEDURES

11.1 It is specifically agreed that in the event any disputes arises out of the interpretation or application of this Agreement, excluding jurisdictional disputes which are covered by an expedited procedure in Article XII below, the same shall be settled by means of the procedure set out herein upon mutual agreement of the parties. Otherwise, the procedure set forth in the local collective bargaining agreement shall be used, but in no case shall both procedures be utilized to resolve such disputes. No such grievance shall be recognized unless called to the attention of the Contractor by the Union or to the Union by the Contractor within five (5) working days after the alleged violation was committed or discovered by the grieving party.

11.2 Grievances shall be settled according to the following procedure:

(a) Step 1. The dispute shall be referred to the Steward of the craft union involved and a representative of the Contractor at the construction project.

(b) Step 2. In the event that the steward and the Contractor's representative at the construction site cannot reach agreement within two (2) working days after a meeting is arranged and held, the matter shall be referred to the Union Business Manager, a representative of the PLA Committee and the Project Superintendent and/or Project Manager.

(c) Step 3. In the event the dispute is not resolved within five (5) working days after completion of Step 2, these two shall request a panel of arbitrators from the U.S. Mediation and Conciliation Service for selection of an impartial arbitrator who shall hear the grievance and make a decision within ten (10) working days which shall be final and binding on all parties. The parties shall each pay the expense of their own representative. The decision of the arbitrator shall be binding upon all parties. The expense of the impartial arbitrator shall be borne equally by the Contractor and the involved craft Union.

ARTICLE XII - JURISDICTIONAL DISPUTES

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.

12.1 All decisions of the Illinois Jurisdictional Dispute Resolution Process are final and binding upon all parties.

12.2 Administrative functions under the Illinois Jurisdictional Dispute Resolution 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.

12.3 The primary concern of the Illinois Jurisdictional Dispute Resolution Process shall be the adjustment of jurisdictional disputes in the construction industry by independent Arbitrators selected by the Illinois State Federation of Labor. A sufficient number of Arbitrators shall be selected from geographical areas of the state of Illinois and shall be randomly assigned to a particular dispute subject only to the Arbitrator's ability to conduct a hearing and render a decision in a timely manner as required under this Process. Decisions shall be only for the specific job under consideration and shall become effective immediately upon issuance and complied with by all parties.

12.4 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 in the local area, the Arbitrator shall then consider whether there is a previous decision of record governing the case, including decisions of construction industry arbitration panels within the geographical jurisdiction of the local area Building Trades Council located within the State of Illinois;

(c) If the Arbitrator finds that a previous decision of record governs the case, the Arbitrator shall apply the decision of record in rendering his/her decision except under the following circumstances: After notice to the other parties to the dispute prior to the hearing that intends to challenge the decision of record, if a trade challenging the decision of record is able to demonstrate that the recognized and established prevailing practice in the locality of the work has been contrary to the applicable decision of record, and that historically in that locality the work in dispute has not been performed by the other craft or crafts, the Arbitrator may rely on such prevailing practice rather than the decision of record. If the craft relying on the decision of record demonstrates that it has performed the work in dispute in the locality of the job, then the Arbitrator shall apply the decision of record in rendering his/her decision. If the Arbitrator finds that a craft has improperly obtained the prevailing practice in the locality through raiding, the undercutting of wages, or the use of

vertical agreements, the Arbitrator shall rely on the decision of record rather than the prevailing practice in the locality;

(d) If no decision of record is applicable, the Arbitrator shall then consider the established trade practice in the industry and prevailing practice in the locality, and any party to the dispute may rely on prior decisions of record, decisions of construction industry arbitration panels within the state of Illinois.

(e) 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.

12.5 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 job in dispute. Agreements of Record 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.

12.6 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 from any liability arising from its action or inaction and covenant not to sue the Federation.

12.7 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 employer shall meet on the job site within forty-eight (48) hours after receiving 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 forty-eight (48) hours 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 Board pursuant to the provisions of the

Jurisdictional Dispute Resolution process, which may be amended from time to time, 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 its designated representative, pursuant to Article II of this agreement. The Administrator shall, within seventy-two (72) hours provide for the selection of an available Arbitrator to hear said dispute within this time period. Upon good cause shown to the Administrator, an additional seventy-two (72) hour 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. All time period contained in this Article specifically exclude Saturdays, Sundays and Holidays.

12.8 The Arbitrator chosen shall be randomly selected based on geographical location of the jurisdictional dispute and upon his/her availability to conduct a Hearing within 48 hours 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 48 hours subsequent to the completion of the Hearing. Copies of all notices, pleadings, supporting memoranda, decisions, etc. shall be provided to all disputing parties, the local Building & Construction Trades Council, 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.

In the event a jurisdictional dispute is not referred to the Illinois Jurisdictional Dispute Resolution Process by either (or any) of the labor organizations claiming the work, the employer may, upon its own initiative, or at the request of the IDNR, petition the Administrator to assign an Arbitrator to hear the case. 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.

12.9 All interested parties shall be entitled to make presentations to the Arbitrator. Any interested 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.

Upon approval of the Arbitrator, other parties not directly involved in the dispute may be invited to be present during the presentation and discussion. 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.

12.10 The Order of Presentation in all Hearings before an Arbitrator shall be:

I. Identification and Stipulation of the Parties
II. Union(s) claiming the disputed work presents its case
III. Unions 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, etc.)
VI. Rebuttal by unions(s) claiming the disputed work
VII. Additional submissions permitted and requested by Arbitrator
VIII. Closing arguments by the parties

12.11 To further the interests of the Illinois Jurisdictional Dispute Resolution Process, it is agreed that any party hereto or any employer may at any time file a Verified Complaint in writing with the Administrator alleging a violation of a decision or award previously made by an Arbitrator. The Administrator shall thereupon set a subsequent Hearing, before the same Arbitrator who presided at the initial Hearing or the next available Arbitrator in the event the original Arbitrator cannot timely hear the Verified Complaint. Said Hearing shall be held within three (3) days of receipt of the Verified Complaint with respect to the alleged violation. The Administrator shall notify all interested parties of the time and place of the Hearing; provided, however, that the party filing the Verified Complaint must have served a copy of said document and all supporting documents to all interested parties and the Administrator.

All parties shall be given an opportunity to testify and present documentary evidence relating to the subject matter of the Hearing. Within forty-eight (48) hours after the conclusion of the Verified Complaint, the Arbitrator shall render a written decision in the matter and shall state whether or not there has been a violation of the Arbitrator's prior decision or award. Copies of the decision shall be served by regular mail, personal service of facsimile.

Should the Arbitrator determine that there has been a violation of its prior decision or award, it shall order immediate compliance by the offending party(s). The Arbitrator may take one or more of the following courses of action in order to enforce compliance with its decision:

a.) Assess liquidated damages not to exceed $5,000.00 for each violation by the members of, or employees represented by, the parties hereto, and may assess liquidated damages not to exceed $10,000.00 for each violation by either party hereto or any of its officers or representatives. If a fine is rendered by the Arbitrator, it should be commensurate with the seriousness of the violation having a relationship to lost hours for the labor organizations and lost efficiency for the employer. Each of the parties hereto hereby agrees for itself and its members to pay to the other party said liquidated damages within thirty (30) days from any sum, or sums, so assessed because of violations of a decision or award by itself, its officers or representatives, or its member(s). Should either party bound to this Process, or any of its members fail to pay the amount so assessed within the thirty (30) day time period herein provided, the party or member so failing to pay shall

be deprived of all the benefits of this Process until such time as the matter is adjusted to the satisfaction of the Administrator; provided, however, the foregoing shall not prohibit the offending party from defending jurisdictional dispute claim in a subsequent, non-related matter.

b.) In the event the Arbitrator determines that there is a violation of this Section, the Arbitrator may order an immediate cessation of all work by the non-compliant employers and employees performing work on the project. Enforcement of any decision of an Arbitrator or finding of non-compliance, including remedies contemplated under this Section, shall be pursuant to the terms and conditions of Section 12.12.

The filing of a Verified Complaint is not a necessary requirement in order for a party to seek judicial enforcement of the Arbitrator's prior decision or award.

12.12 The Illinois Jurisdictional Dispute Resolution 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. The prevailing party in any enforcement proceedings shall be entitled to recover its costs and attorneys fees from the non-prevailing party. In the event the Illinois Jurisdictional Dispute Resolution Process or its Administrator is made a party to, or is otherwise required to participate in any such enforcement proceedings for whatsoever reason, the non-prevailing party shall bear all costs, attorneys' fees, and any other expenses incurred by the Process or the Administrator in those proceedings.

12.13 In the event 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.

12.14 All parties bound to the provisions of this Process hereby release the Illinois State Federation of Labor and the IDNR, 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.

ARTICLE XIII - WORK STOPPAGES AND LOCKOUTS

13.1 During the term of this Agreement there shall be no strikes, picketing, work stoppages, slow downs are other disruptive activity for any reason by the PLA Committee, its affiliates or by any employee and there shall be no lockout by the Contractor. Failure of any Union or employee to cross any picket line established at the project site is a violation of this

Article.

13.2 The PLA Committee and its affiliates shall not sanction, aid or abet, encourage or continue any work stoppage, picketing or other disruptive activity and will not make any attempt of any kind to dissuade others from making deliveries to or performing services for or otherwise doing business with the Contractor at the project site. Should any of these prohibited activities occur the Union will take the necessary action to end such prohibited activities.

13.3 No employee shall engage in any activities which violate this Article. Any employee who participates in or encourages any activities which interfere with the normal operation of the project shall be subject to disciplinary action, including discharge, and if justifiably discharged for the above reasons, shall not be eligible for rehire on the same project for a period of not less than ninety (90) days.

13.4 Neither the PLA Committee nor its affiliates shall be liable for acts of employees for which it has not responsibility. The principal officer or officers of the PLA Committee will immediately instruct, order and use the best efforts of his office to cause the affiliated union or unions to cease any violations of this Article. The PLA Committee in its compliance with this obligation shall not be liable for unauthorized 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 right in any instance shall not be deemed a waiver of its right in any other instance.

13.5 In lieu of any action at law or equity, any party shall institute the following procedure when a breech of this Article is alleged, after all involved parties have been notified of the fact.

(a) The party invoking this procedure shall notify an individual to be mutually agreed upon, whom the parties agree shall be the permanent arbitrator under this procedure. In the event the permanent arbitrator is unavailable at any time, he shall appoint his alternate. Notice to the arbitrator shall be by the most expeditious means available, with notice by telegram or any effective written means to the party alleged to be in violation and all involved parties.

(b) Upon receipt of said notice the arbitrator named above shall set and hold a hearing within twenty-four (24) hours if it is contended the violation still exists but not before twenty-four (24) hours after the telegraph notice to all parties involved as required above.

(c) The Arbitrator shall notify the parties by telegram or any other effective written means, of the place and time he has chosen 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 Arbitrator.

(d) The sole issue at the hearing shall be whether or not a violation of this Article has in fact occurred. The Award shall be issued in writing within three (3) hours after the close of the hearing, and may be issued without an

Opinion. If any party desires an Opinion, one shall be issued within fifteen (15) days, but its insurance shall not delay compliance with, or enforcement of, the Award. The 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.

(e) Such Award may be enforced by any court of competent jurisdiction upon the filing of the Agreement and all other relevant documents referred to herein above in the following manner. Telegraphic notice of the filing of such enforcement proceedings shall be given to the other party. In the proceeding to obtain a temporary order enforcing the Arbitrator's Award as issued under Section 13.5 of 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 Arbitrator's Award shall be served on all parties by hand or by delivery to their last known address or by registered mail.

(f) 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.

(g) The fees and expenses of the 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 XIV - GENERAL SAVINGS CLAUSE

14.1 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.

ARTICLE XV - TERM OF AGREEMENT

15.1 This Agreement shall be in full force as of and from the date of the Notice of Award to the Substantial Completion of all applicable contractors.

Project # FR-435
William G. Stratton Lock & Dam, Plans for Lock & Gate Structure Improvements
Illinois Department of Natural Resources

Contractor Letter of Assent

_____
(Date)

To All Parties:

In accordance with the terms and conditions of the contract for the referenced water resource project, 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 Natural Resources 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 **

SCHEDULE A

PARTICIPATION AGREEMENT

The undersigned, a subcontractor to _____ agrees to be bound to the attached Project Agreement negotiated between _____ and the PLA Committee.

_____ _____

Subcontractor By

_____

Date

Jim Allen
Bricklayers

Curtis Cade
United Association

*
Ed Christensen, Elevator Constructors

Terry Fitzmaurice
Painters

Pat Gleason
Teamsters

Terrence Healy
LIUNA

David Beard
Iron Workers

Patrick J. LaCassa
OPCMIA

*only If Elevator Constructors master agreement language is attached to PLA

Terry Lynch
Heat & Frost Insulators & Allied Workers

Richard Mathis
Roofers

Paul Noble
IBEW

IUOE abstain from vote to pass project(s).

Robert Paddock
IUOE

Gary Perinar Jr.
Carpenters

Brian Mulheran
Sheet Metal Workers

John Skermont
Bollermakers

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.

William G. Stratton Lock & Dam
Plans for Lock & Gate Structure Improvements
McHenry County FR-435

ILLINOIS
DEPARTMENT OF
NATURAL RESOURCES
Office of Water Resources

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.

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.

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.

C. Debt Delinquency

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

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

D. Prohibited Bidders, Contractors and Subcontractors

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

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

E. Section 42 of the Environmental Protection Act

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

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

_____
Name of Subcontracting Company

_____ _____
Authorized Officer Date

RETURN WITH SUBCONTRACT

SUBCONTRACTOR DISCLOSURES

I. DISCLOSURES

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

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

B. Financial Interests and Conflicts of Interest

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

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

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

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

C. Disclosure Form Instructions

Form A Instructions for Financial Information & Potential Conflicts of Interest

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

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

   (Note: Distributive income is, for these purposes, any type of distribution of profits. An annual salary is not distributive income.)
4. Does anyone in your organization receive greater than 5% of the subcontracting entity's or parent entity's total distributive income, but which is less than 60% of the annual salary of the Governor? YES ___ NO __

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

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

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

RETURN WITH SUBCONTRACT

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

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

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

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

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

DISCLOSURE OF FINANCIAL INFORMATION

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

FOR INDIVIDUAL (type or print information)

NAME: _____

ADDRESS _____

_____

Type of ownership/distributable income share:

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

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

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

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

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

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

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

3. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor?
   Yes ___No __

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

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

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

1. Is your spouse or any minor children currently an officer or employee of the Capitol Development Board or the Illinois Toll Highway Authority? Yes ___No __

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

3. If your spouse or any minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, as of 7/1/07) are you entitled to receive (i) more then 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor? Yes ___No __

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

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

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

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

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

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

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

DISCLOSURE OF OTHER CONTRACTS, SUBCONTRACTS, AND PROCUREMENT RELATED INFORMATION

1. Identifying Other Contracts & Procurement Related Information. The SUBCONTRACTOR shall identify whether it has any pending contracts, subcontracts, including leases, bids, proposals, or other ongoing procurement relationship with any other State of Illinois agency: Yes ___ No __
If "No" is checked, the subcontractor only needs to complete the signature box on the bottom of this page.

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

THE FOLLOWING STATEMENT MUST BE CHECKED

☐ _____ _____
Signature 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)

ILLINOIS
DEPARTMENT OF
NATURAL RESOURCES
Office of Water Resources

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 o'clock a.m., February 28, 2014. All bids will be gathered, sorted, publicly opened and read in the auditorium at the Department of Transportation's Harry R. Hanley Building shortly after the 10:00 a.m. cut off time.

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

1W McHenry County
FR-435
Stratton Lock & Dam – Lock & Gate Structure Improvements

The proposed project is located at the Stratton Lock & Dam in the City of McHenry, Illinois on the Fox River. The work consists of constructing: an extension of the existing lock, existing lockhouse renovation, demolition of the existing sluice gate structure, construction of a new flood control structure with hinged crest gates, installation of remote gate operation controls at the Stratton lockhouse to control the flood control gates at Algonquin, IL, restoration of the upstream right bank berm, construction of a new maintenance docking pier, and all associated site work.

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 Illinois Department of Transportation and the Illinois Department of Natural Resources 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 project, and to waive technicalities.

By Order of the

Illinois Department of Natural Resources

Marc Miller, Director

STANDARD SPECIFICATIONS

The "Standard Specifications for Road and Bridge Construction," prepared by the Department of Transportation of the State of Illinois and adopted by said Department, January 1, 2012; as amended and supplemented by the "Supplemental Specifications and Recurring Special Provisions," adopted January 1, 2014 (hereinafter referred to collectively as "Standard Specifications"), are incorporated by reference and made a part of this Contract for the William G. Stratton Lock & Dam, Plans for Lock & Gate Structure Improvements, McHenry County, FR-435. (The Standard Specifications can be purchased from the Illinois Department of Transportation or downloaded from their web site.)

SPECIAL PROVISIONS

The following Special Provisions supplement the Standard Specifications, the latest edition of the “Manual on Uniform Traffic Control Devices for Streets and Highways,” 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 the “William G. Stratton Lock & Dam, Plans for Lock & Gate Structure Improvements, FR-435” project, and in the case of conflict with any part, or parts, of said Specifications, the said Special Provisions shall take precedence and shall govern.

DEFINITION OF TERMS

In the application of the Standard Specifications, the Recurring Special Provisions, the LRS special provisions, the BDE Special Provisions, and the GBSP Special Provisions to this Contract, references to the Department of Transportation shall be interpreted to mean the Department of Natural Resources, Office of Water Resources, Division of Project Implementation (Department); except that references to the Department of Transportation within Section 102 - Advertisement, Bidding, Award, and Contract Execution, and references to Department publications - shall continue to mean the Department of Transportation. References to the Division of Highways shall be interpreted to mean the Department of Natural Resources; Office of Water Resources; Division of Project Implementation.

Wherever the word “Engineer” is used, it shall mean the Director of the Office of Water Resources of the Department of Natural Resources of the State of Illinois: or his authorized representative limited by the particular duties entrusted to him, nominally the Chief of Design of the Division of Project Implementation or his delegated representative.

Wherever the words “Right of Way” are used, it shall mean a general term denoting land, property, or interest therein, usually a strip, acquired for or devoted to water resource projects.

Wherever the words “Central Bureau of Construction” or District Office” are used, it shall mean the Department of Natural Resources, Office of Water Resources, Division of Project Implementation.

The advertising for Bids, Prequalification of Bidders, Issuance of Proposals, Proposal Guarantee, and Acceptance and Opening of Bids shall be in accordance with the policies and procedures of the Illinois Department of Transportation. Proposals, Schedule of Prices, Signature Sheet and other bidding or contract requirements as utilized by the Department of Natural Resources; Office of Water Resources; Division of Project Implementation shall apply to this contract.

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

CHECK SHEET
FOR
RECURRING SPECIAL PROVISIONS

Adopted January 1, 2014

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

RECURRING SPECIAL PROVISIONS

CHECK SHEET
FOR
LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS

Adopted January 1, 2014

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

LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS

TABLE OF CONTENTS

SPECIAL PROVISIONS

GUIDE BRIDGE SPECIAL PROVISIONS (GBSP)

BUREAU OF DESIGN AND ENVIRONMENT (BDE) SPECIAL PROVISIONS

PREVAILING WAGES

STATE OF ILLINOIS

SPECIAL PROVISIONS

LOCATION OF PROJECT

The proposed improvement is located in Section 12 of Township 44 North, Range 8 East of the Third Principal Meridian, in McHenry County, Illinois. The project is at the Stratton Lock & Dam in the City of McHenry on the Fox River.

DESCRIPTION OF PROJECT

The work of this contract consists of furnishing labor, services, equipment, supplies and incidentals of every kind necessary for constructing:

- An extension of the existing lock,
- Existing lockhouse renovation
- Demolition of the existing sluice gate structure,
- Construction of a new flood control structure with hinged crest gates,
- Installation of remote gate operation controls at Stratton for the flood control gates at Algonquin, IL,
- Restoration of the upstream right bank berm
- Construction of new maintenance docking piers, and
- Associated site work.

PLANS AND DRAWINGS

The work to be done is shown on the drawings entitled “William G. Stratton Lock & Dam – Plans for Lock & Gate Structure Improvements, McHenry County, FR-435”.

CONTRACTORS USE OF THE SITE

The Stratton Lock’s navigation season is May 1 to October 31 of each year. The lock will remain in service during the navigation seasons until the project is complete. The Contractor shall be subject to the following work restrictions:

1. Work within the lock channel, including the existing lock, lock extension, mooring fence, channel dredging, and maintenance dock, shall be prohibited within the navigation season.
2. Work on the lock house and landside site work shall be coordinated with the lockmaster during the navigation season.
3. Contractor may use the lock and lock channel to access other work areas during the navigation season, provided that the disruption of normal traffic is minimized. Contractor will not be given preferential use of the lock. The Department may restrict the Contractor’s

use of the lock channel during periods of peak use, which usually occurs on weekends and holidays but may occur during other times.

4. At the conclusion of each navigation season, the Department will restrict the public's use of the lock and the Contractor shall be given preferential use of the lock.
5. Prior to each navigation season, the Contractor shall remove all equipment and material from the navigation channel and restore the lock to a navigable condition. Contractor shall rewater the lock channel, remove temporary cofferdams occupying the channel, and construct temporary or permanent guide walls, bumpers, etc. to separate boat traffic from any partially completed work. Contractor shall restore, relocate, and adjust (as necessary), navigation markers, signage, lights, and downstream mooring fence. Contractor shall provide a secure mooring area for the Lock Master's boat at either the current location or an alternate location acceptable to the Lock Master.
6. The Contractor shall submit a Temporary Boat Traffic Control Plan demonstrating the ability to fulfill these requirements for the various stages of lock construction, subject to acceptance by the Engineer. Cost for the above items/tasks shall be included in the Temporary Boat Traffic Control and Channel Restoration pay item.

The existing gate structure functions as the spillway for the Stratton Dam. The Department will continue to operate this structure according to the current flood operations plan until the new gate structure is operational. The Contractor shall phase construction of the new gate as shown in the contract documents.

In addition, the following restrictions shall apply to the Work:

1. Barges, work boats, or other floating plant equipment shall not be moored, anchored, tied off, or set against the existing lock and dam structures at all sites, unless accepted otherwise by the Engineer. Mooring barges, work boats, and floating plants are allowed inside the Lock Chambers and Upper and Lower approaches. The Contractor shall be aware of possible rising or falling river levels and moor equipment as necessary to avoid damage to structures. All floating plant equipment shall be firmly and sufficiently anchored in place to prevent contact with the existing lock and dam structures at all times.
2. Blasting is prohibited.
3. Noise Abatement: Except when accepted by the Engineer, vibratory or impact-type equipment (vibratory and/or impact pile drivers, vibratory and/or impact drilling equipment, hydraulic or pneumatic demolition or rock drills/hammers, etc.) shall not be used from 8:00 p.m. until 7:00 a.m. local time. Furthermore, the Contractor shall plan and execute the Work so that noise due to construction does not exceed 85 decibels when measured anywhere along the Contractor's Work Limits, unless accepted otherwise by the Engineer.
4. Nighttime operations: If the Contractor performs nighttime operations, the work area shall be appropriately illuminated to provide for proper Engineer observation and safe performance of Work.

CONTRACT CLAIM

The following provisions shall be substituted in Article 109.09 of the Standard Specifications.

(1) The title District Engineer shall mean Chief of Design, Division of Project Implementation.

(2) The section titled **Procedure** shall be as follows:

PROCEDURE

All claims must be submitted to the Chief of Design, Division of Project Implementation. The Contractor may request an opportunity to present the claim verbally at each of the following levels if the claim has not been satisfactorily resolved at the previous level.

(a) Chief of Design, Division of Project Implementation
(b) Director of Water Resources

All requests for presentation must be made through the Chief of Design, Division of Project Implementation. Requests by the Contractor to present a claim at the second level will be accompanied by two additional copies of the claim with addenda.

Full compliance by the Contractor with the provisions of this Special Provision is a contractual condition precedent to the Contractor's right to seek relief in the Court of Claims. The Director's written response shall be deemed a final 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 response, the failure to so file shall constitute a release and waiver of the claim.

VALUE ENGINEERING PROPOSALS

Replace Section (a) of Article 104.07 of the Standard Specifications with the following:

(a) Proposal Submittals. Value Engineering Proposals shall be submitted in two phases as follows:

(1) Concept Phase. Prior to the submittal of any Value Engineering Proposal, the Contractor shall submit a brief summary outlining the concept of the proposal to the Division of Project Implementation. Within five working days after receipt of the proposal concept, the Department will notify the Contractor as to whether or not the proposal concept qualifies for consideration as Value Engineering. If it appears, based on the concept, that the actual proposal will require a review period exceeding the normal review period, as outlined below, the Contractor will be so advised. Approval of the concept does not constitute or imply approval of the subsequent submittal of the complete Value Engineering Proposal.

(2) After the concept has been approved, the Contractor, if electing to proceed with submittal of the complete Value Engineering Proposal, shall submit the proposal to the Division of Project Implementation for review. Provided the proposal is complete and contains all the required information for review, the Chief of Design of the Division of Project Implementation will notify the Contractor, within 10 working days after receipt of the proposal, as to the acceptability of the proposal, unless additional review time has been established as noted in the concept review process.

WORKING DAYS

Complete all construction by November 1, 2016. The only work to be allowed after the completion date will be reseeding/repair of seeded areas that do not provide the required cover after one growing season.

CONTRACT ENDING DATE

This Contract shall end on or before June 1, 2017 (see also interim progress date below).

PROGRESS AND LIQUIDATED DAMAGES

All work shall proceed in accordance with a Progress Schedule as provided in Article 108.02 of the Standard Specifications.

Failure to complete the lock extension and open the lock to recreational boating traffic by May 1, 2016 shall be considered a material breach of the Contract and the Department may assess liquidated damages immediately upon such failure, and until said work is completed, as provided in article 108.09 of the Standard Specifications.

All remaining work, including final clean-up, removal of equipment, final inspection, any alterations, repair, remedial or holdover work, reseeding, and submission of the final pay request shall be completed prior to the completion date of November 1, 2016. Failure to do so shall be considered a material breach of the Contract and the Department may assess liquidated damages immediately upon such failure, and until said work is completed, as provided in article 108.09 of the Standard Specifications.

CONSTRUCTION PROCEDURE / PERMITS

The Contractor's attention is directed to the fact that the IDNR/Office of Water Resources (OWR), the U.S. Army Corps of Engineers, the Illinois Environmental Protection Agency, and the McHenry – Lake County Soil & Water Conservation District have issued permits and/or sign-offs for this project. The Contractor is required to obtain and submit to the OWR any and all other permits for construction required by local ordinances, state and/or federal laws. Any fees required for the procurement of other permits which may be necessary shall be at the expense of the Contractor, not to be reimbursed by the State, but to be considered included in the various items of work. The Contractor shall be required to become a party to the OWR Storm Water Pollution Prevention Plan, as mandated by the Illinois Environmental Protection Agency General Permit for Storm Water Discharges (the NPDES permit). These permits are included in this special provision.

These permits contain certain requirements which may affect the construction of this project. It will be the Contractor's responsibility to familiarize himself/herself with the requirements of the abovementioned permits/documents and conduct his/her work in accordance with those requirements and the special provision contained herein. See the following pages for copies of the permits/documents and the NPDES permit Notice of Intent and Notice of Termination forms. The Storm Water Pollution Prevention Plan (SWPPP) along with the Contractor Certification Statement form for same, and the SWPPP Erosion Control Inspection Report form are included in the Erosion Control System special provision.

Should the Contractor desire to use materials, construction methods, or procedures which differ substantially from those authorized by the above referenced permits/documents, it is the responsibility of the Contractor to obtain approved amendments to same.

All costs incurred by the Contractor in complying with the applicable requirements of the above-mentioned permits/documents shall be considered as completely covered by the contract unit prices bid for the various items of work in the proposal.

These pages intentionally left blank for future insertion of the Illinois Department of Natural Resources, Office of Water Resources permit and the U. S. Army Corp of Engineers permit.

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

OCT 16 2013

U.S. Army Corps of Engineers, Chicago District
Regulatory Branch
231 South LaSalle Street, Suite 1500
Chicago, IL 60604

Re: Illinois Department of Natural Resources (McHenry County)
Stratton Lock and Dam life extension project – Fox River mile 97.7
Log # C-0042-13 [CoE appl. # 2011-00763]

Gentlemen:

This Agency received a request on June 6, 2013 from the Illinois Department of Natural Resources requesting necessary comments concerning the Stratton Lock and Dam life extension project impacting the Fox River. 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; or

   c. interference with water use practices near public recreation areas or water supply intakes.

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; 2012).

6. The proposed work shall be constructed with adequate erosion control measures (i.e., silt fences, straw bales, turbidity curtains, etc.) to prevent transport of sediment and materials downstream.

7. 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.

8. The applicant shall use adequate measures (i.e., flumes, culverts, etc.) to maintain normal stream flow during construction.

9. Construction of cofferdams shall not result in a release of sediment into waters of the state. Cofferdams shall be constructed of non-erodible materials. Acceptable practices include pre-fabricated rigid cofferdams, sheet piling, inflatable bladders, sandbags and fabric-lined basins.

10. If dredging activities propose the use of any treatment facilities (settling basins, geotubes, containment facilities for hydraulically dredged materials, etc.), a construction and operation permit issued by the Agency under 35 Ill. Adm. Code Section 309.202 and 309.203 must be obtained and any conditions thereof complied with.

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

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:TJF:0042-13.docx

cc: IEPA, Records Unit
IEPA, DWPC, FOS, Des Plaines
IDNR, OWR, Bartlett
USEPA, Region 5
Mr. Ted Montrey, Illinois Department of Natural Resources

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

SEP 17 2013

RECEIVED
OFFICE OF WATER RESOURCES
SPRINGFIELD, ILLINOIS
SEP 18 2013

AS DIR
PGM D PI
PLNG RM

Mr. Ted Montrey
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702

Re: Illinois Department of Natural Resources – Stratton Lock and Dam Life Extension Project
CoE # 2011-00763
Log No. C-0042-13
Antidegradation Assessment

Dear Mr. Montrey:

Attached to this letter is a copy of the Public Notice/Fact Sheet regarding antidegradation assessment for the subject project.

Section 401 certification will be held in abeyance pending review of any public comments and other additional information submitted regarding the 401 application including any information necessary to complete the 401 application. After review of this information, the Agency will proceed with the 401 certification process regarding the certification application.

If you should have questions or comments regarding the above or the attached, please contact Thaddeus Faught at 217-782-3362.

Very truly yours,

Daniel L. Heacock, P.E.
Manager, Facility Evaluation Unit
Permit Section
Division of Water Pollution Control

DLH:TJF:0042-13LET.docx

Attachments: Public Notice/Fact Sheet

cc: Records
Corps of Engineers, Chicago District

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

IEPA Log No.: **C-0042-13**
CoE appl. #: **2011-00763**

Public Notice Beginning Date: **September 17, 2013**
Public Notice Ending Date: **October 8, 2013**

Section 401 of the Federal Water Pollution Control Act
Amendments of 1972

Section 401 Water Quality Certification to Discharge into Waters of the State

Public Notice/Fact Sheet Issued By:

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-3362

Name and Address of Discharger: Illinois Department of Natural Resources, One Natural Resources Way, Springfield, IL 62702

Discharge Location: Section 12, T44N, R8E of the 3rd P.M. in McHenry County near McHenry

Name of Receiving Water: Fox River mile 97.7

Project Description: Stratton Lock and Dam life extension project.

The Illinois Environmental Protection Agency (IEPA) has received an application for a Section 401 water quality certification to discharge into the waters of the state associated with a Section 404 permit application received by the U.S. Army Corps of Engineers. The Public Notice period will begin and end on the dates indicated in the heading of this Public Notice. The last day comments will be received will be on the Public Notice period ending date unless a commenter demonstrating the need for additional time requests an extension to this comment period and the request is granted by the IEPA. Interested persons are invited to submit written comments on the project to the IEPA at the above address. Commenters shall provide their names and addresses along with comments on the certification application. Commenters may include a request for public hearing. The certification and notice number(s) must appear on each comment page.

The attached Fact Sheet provides a description of the project and the antidegradation assessment.

The application, Public Notice/Fact Sheet, comments received, and other documents are available for inspection and may be copied at the IEPA at the address shown above between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

If written comments or requests indicate a significant degree of public interest in the certification application, the IEPA may, at its discretion, hold a public hearing. Public notice will be given 30 days before any public hearing. If a Section 401 water quality certification is issued, response to relevant comments will be provided at the time of the certification. For further information, please call Thaddeus Faught at 217/782-3362.

TJF:0042-13PN.docx

Fact Sheet for Antidegradation Assessment
Illinois Department of Natural Resources – Fox River – McHenry County
IEPA Log No. C-0042-13
COE Log# LRC-2011-00763
Contact: Eric Runkel (217) 558-2012
September 17, 2013

The Illinois Department of Natural Resources (Applicant) is applying for a 401 water quality certification for impacts associated with a construction project at the William G. Stratton Lock and Dam near McHenry, Illinois. The concrete and metal sluice gates were originally constructed in 1939. The sluice gates are no longer fully operative. The proposed project would consist of removing the existing sluice gates and replacing them with a new type of gate. The project also includes increasing the capacity of the existing lock by extending the current lock to help alleviate the 2-4 hour wait to clear this lock during high boating season and the rehabilitation of the berm along the west bank of the Fox River upstream of the lock and dam.

Antidegradation assessment material were received from the applicant under a May 21, 2013 dated cover letter, 401 Application Review Form, Stratton Life Extension Project, ACOE Permit LRC-2011-00763, IEPA Log # C-0042-13, received June 6, 2013.

Identification and Characterization of the Affected Water Body.

The Fox River has a 7Q10 flow of 94 cfs at this location and is a General Use water. The Fox River, Waterbody Segment IL_DT-23 is listed in the Illinois Integrated Water Quality Report and Section 305(b)/303(d) List 2012 as impaired for Aquatic Life: Alteration in Stream-side or Littoral Vegetation (non-pollutant), Aquatic Algae (non-pollutant), Cause Unknown and Other Flow Alteration (non-pollutant) are listed as the causes of this impairment and Fish Consumption use; polychlorinated biphenyls is given as the cause of this impairment. The river is fully supporting of Primary Contact Recreation and Secondary Contact. Aesthetic Quality has not been assessed. The river at this location is not an enhanced waterbody pursuant to the dissolved oxygen water quality standard. The river is not listed as biologically significant, but has been given an integrity rating of "B" in the 2008 Illinois Department of Natural Resources Publication Integrating Multiple Taxa in a Biological Stream Rating System.

Identification of Proposed Pollutant Load Increases or Potential Impacts on Uses.

No pollutant load increases would occur from this project other than some increases in suspended solids near the location of cofferdams and berm rehabilitation. Approximately 0.14 acres of Waters of the U.S. (WAUS) will be permanently filled by the construction of a new torque tube gate and 0.10 acres of WAUS will be permanently filled for the lock extension. Benthic organisms will be disturbed by construction activities and aquatic life in the area will be temporarily disturbed by use of the cofferdams. Approximately 1,370 linear feet of berm on the upstream west riverside slope is proposed to be improved by erosion protection material (geotextile and riprap) to the original 1945 cross-section, affecting 0.33 acres below the ordinary high water elevation of 738.5 feet (1.5 feet above the normal water line).

Fate and Effect of Parameters Proposed for Increased Loading.

Aquatic communities at least as diverse as currently inhabit the river will return upon construction completion. Sediment and soil erosion control plans will be utilized during construction. Silt fencing and straw bales will be properly located to minimize runoff to surface waters and wetland areas. Silt curtains will be used to reduce impacts to the Fox River from the areas of construction.

The existing sluice gates will be removed to the gate sill, thus returning 0.08 acres of fill to the WAUS. Approximately 0.57 acres will be required by the Corps to be mitigated through an approved wetland mitigation bank. It was stated in the Section 404 public notice, "If a permit is issued for the proposed project, the Corps will determine what is appropriate and practicable compensatory mitigation in accordance with 33 CFR Part 332. The amount of compensatory mitigation to be determined shall be commensurate with anticipated impacts of the project." The scour hole created by the existing dam downstream of the sluice gate structure will not be filled. The potential for suspension of fine grain particles entering into the river during the filling process was too great; therefore the proposal to fill the scour hole was removed from the proposal.

The lock construction will extend the existing lock by 76 feet. The chosen lock extension poses the least disturbance to the Fox River of all the lock alternatives. By increasing the capacity of the lock, the boats will be idling in the channel for less time which should decrease the release of hot water from the boat engines and potential contaminants to the river. The lock extension will be constructed after the boating season which will allow for complete closure of the lock during construction. The construction will be isolated from the open water by installing the upstream stop logs and installing a cofferdam downstream of the construction. Filling behind the walls of the lock extension will be completed in the dry. The discharge of de-watering activities behind the cofferdam will be completed through filter bags adjacent to the Fox River. The new lock filling inlet pipe will be constructed in the dry. The expansion of the lock will not encroach on the public waters as the lock and dam restriction already exists.

The new gate structure being proposed is a torque tube design and will be in the same channel as the existing gate structure. The proposed gate structure includes a stilling basin which will minimize downstream erosion. The operation plan for the gates will remain the same, therefore no changes in flows or water surface elevations will occur. The area within the cofferdams will be dewatered to allow work within the cofferdam to be done in the dry. The discharge of de-watering activities behind the cofferdam will be completed through filter bags adjacent to the Fox River. The gate structure and the sluice gate removal will be constructed in two phases so the waterway will not be completely constricted.

The berm rehabilitation will be constructed behind a silt curtain. The silt curtain will tie into the bank upstream and downstream of the construction site. The berm rehabilitation will be completed in sections. No work is proposed within the adjacent wetlands.

No adverse impacts to the river would occur for this activity as all water quality standards are expected to be met.

Purpose and Social & Economic Benefits of the Proposed Activity.

Navigation will be enhanced by the extension of the lock which will encourage more people to boat between the Chain of Lakes and Fox River as the wait time is estimated to be shorter. The new gate structure will be operated remotely thus preventing potential problems when manipulating a frozen gate by hand during the winter. The new torque tube gate will also allow for easier operation during winter months because the design is meant to prevent potential fouling during freezing conditions. The berm rehabilitation will prevent the river from bypassing the dam and potentially flooding subdivisions downstream.

Assessments of Alternatives for Less Increase in Loading or Minimal Environmental Degradation.

Rehabilitate Existing Gates

If the concrete structure is sound including no under-seepage, the gates and control works could be replaced. The hydraulic efficiency will be exactly the same as the current conditions. This option does little to address the ice management problems. Heaters could be added to the tracks but steam wands would be needed to thaw the ice off the gate face. This option was removed from further consideration because it would not significantly relieve the icing problems.

New Vertical Roller Gates

This proposal would consist of installing 4 new vertical roller gates, each 17 feet in length with a stilling basin. The existing vertical roller structure would be removed. Constructing the same gate design does little to improve the ice management issues. The land disturbance would be width of the gate channel for approximately 120 lineal feet, which would be approximately 0.10 acres. Additional disturbance would include the removal of the existing structure for width of the gate channel for approximately 41 lineal feet, which would be approximately 0.08 feet. This option was removed from further consideration because of the additional cost and it would not significantly relieve the icing problems.

Submersible Tainter Gates

This proposal is to build a new gate structure which utilizes submersible tainter gates with a stilling basin. Three new gates with a 24 feet length would pass the equivalent flow during flood events. The gate will not freeze because the water will be flowing over it. However, during below freezing temperatures the gate must be moved frequently (i.e., every 3 hours), so the hoisting system for the gate does not freeze. Moving the gate frequently is inconvenient since the facility is unmanned in the winter during weekday night-time hours and the weekend. The land disturbance would include the removal of the existing structure for the width of the gate channel for approximately 125 lineal feet, which would be approximately 0.12 acres. Additional disturbance would include the removal of the existing structure for width of the gate channel for approximately 41 lineal feet, which would be approximately 0.08 feet. This option was removed from further consideration.

Torque Tube Gates

This proposal is to build a new gate structure which utilizes torque tube gates, a hinged crest gate with a stilling basin. There will be three gates with a 28 foot length each which would pass the equivalent

flows of the existing structure. The existing vertical roller gates would be removed. The torque tube gates would provide the best ice management option. Keeping water flowing over the gates in the winter along with the abutment heaters will prevent the ice from forming on the gates. The gates would be setup to have redundant gate operators so failure of one mechanical system would not hinder gate operations. The land disturbance would be the width of the gate channel for approximately 130 lineal feet, which would be approximately 0.14 acres. Additional disturbance would include the removal of the existing structure for width of the gate channel for approximately 41 lineal feet, which would be approximately 0.08 feet. This proposal is preferred and was chosen through a criteria ranking system used by IDNR to compare alternatives.

Additional Lock Riverward

A new lock would be constructed on the river side of the existing lock. Excavation on the island and the departure and approach reaches on the Fox River would be required. Approximately 0.18 acres of WAUS would be created. This option would double the existing lock capacity; however, two lock tenders would be required to operate the locks at peak times. Having two locks would enhance the lock system by having one lock functional for boat traffic if the other lock required maintenance. Utilities would need to be brought to the island. Because of additional construction cost and operating expenses this option was eliminated from consideration.

Additional Lock Landward

A new lock would be constructed on the land side of the existing lock. Excavation on the bank and the departure and approach reaches on the Fox River would be required. Approximately 0.14 acres of WAUS would be created. The gate house would be removed and a new gate control house would need to be constructed. A pilot house would be constructed between the locks so both locks could be viewed. This option would double the existing lock capacity; however, two lock tenders would be required to operate the locks at peak times. Having two locks would enhance the lock system by having one lock functional for boat traffic if the other lock required maintenance. Because of additional construction cost, operating expenses and greater land disturbance this option was eliminated from consideration.

Lock Extension

This proposal would extend the existing lock downstream by 76 feet which would double the size of the lock. The existing downstream miter gate will be removed, rehabilitated and utilized in the new lock. The water filling and empty system would be supplemented with an additional system for the lock extension. Filling of the lock channel behind the lock extension walls will be necessary; approximately 0.10 acres of WAUS will be filled. The existing lock appurtenances will be rehabilitated. The lock capacity would more than double. The land disturbance adjacent to the lock would be minimal. This proposal is preferred and was chosen through a criteria ranking system used by IDNR to compare alternatives.

Berm Rehabilitation

If no action is taken there is a possibility of water going around the dam and potentially entering the subdivision downstream of the dam. The berm is eroding on the riverside. Repairs to the berm are proposed to correct the erosion and restore the top grade.

Summary Comments of the Illinois Department of Natural Resources, Regional Planning Commissions, Zoning Boards or Other Entities.

The IDNR utilized a Comprehensive Environmental Review Process (CERP) to analyze this project. The CERP for this project was approved without restrictions on January 3, 2011. The CERP was renewed on May 23, 2013. The IDNR has been in contact with the McHenry County Soil and Water Conservation District (MCSWCD) and informed them that all activities will be on State of Illinois property and no impacts will occur to MCSWCD wetland. The IDNR agreed to comply with conditions requested by the MCSWCD including, but not limited to, notification of any pre-construction changes to design, invitation to pre-construction meetings, and notification of commencement of work. The Illinois Historic Preservation Agency (IPHA) concurred on October 14, 2010 that no adverse effects would occur at this site from the proposed work.

Agency Conclusion.

This preliminary assessment was conducted pursuant to the Illinois Pollution Control Board regulation for Antidegradation found at 35 Ill. Adm. Code 302.105 (antidegradation standard) and was based on the information available to the Agency at the time the antidegradation review summary was written. We tentatively find that the proposed activity would result in the attainment of water quality standards; that all existing uses of the receiving streams would be maintained; that all technically and economically reasonable measures to avoid or minimize the extent of the proposed increase in pollutant loading have been incorporated into the proposed activity; and that this activity would benefit the community at large through enhanced navigation by increasing boat capacity at the lock and providing safer ice management for gate operations during winter months. Comments received during the 401 certification public notice period will be evaluated before a final decision is made by the Agency.

General NPDES Permit No. ILR10

Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
www.epa.state.il.us

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

General NPDES Permit
For
Storm Water Discharges From Construction Site Activities

Expiration Date: July 31, 2018 **Issue Date:** July 30, 2013

Effective Date: August 1, 2013

In compliance with the provisions of the Illinois Environmental Protection Act, the Illinois Pollution Control Board Rules and Regulations (35 Ill. Adm. Code, Subtitle C, Chapter I), and the Clean Water Act, and the regulations thereunder the following discharges are authorized by this permit in accordance with the conditions and attachments herein.

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

Part I. COVERAGE UNDER THIS PERMIT

A. **Permit Area.** The permit covers all areas of the State of Illinois with discharges to any waters of the State.

B. **Eligibility.**

1. This permit shall authorize all discharges of storm water associated with industrial activity from a construction site that will result in the disturbance of one or more acres total land area or a construction site less than one acre of total land that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb one or more acres total land area. This permit may authorize discharges from other construction site activities that have been designated by the Agency as having the potential to adversely affect the water quality of waters of the state. This permit also authorizes discharges from construction sites previously approved by the Agency under the previous version of ILR10 that are still occurring after the effective date of this permit, except for discharges identified under Part I.B.3 (Limitations on Coverage). Where discharges from construction sites were initially covered under the previous version of the ILR10, the Storm Water Pollution Prevention Plan must be updated/revised as necessary to ensure compliance with the provisions of this reissued ILR10 permit in accordance with Part II.A.2.

2. This permit may only authorize a storm water discharge associated with industrial activity from a construction site that is mixed with a storm water discharge from an industrial source other than construction, where:

   a. the industrial source other than construction is located on the same site as the construction activity;

   b. storm water discharges associated with industrial activity from the areas of the site where construction activities are occurring are in compliance with the terms of this permit; and

   c. storm water discharges associated with industrial activity from the areas of the site where industrial activities other than construction are occurring (including storm water discharges from dedicated asphalt plants and dedicated concrete plants) are covered by a different NPDES general permit or an individual permit authorizing such discharges.

3. **Limitations on Coverage.** The following storm water discharges from construction sites are not authorized by this permit:

   a. storm water discharges associated with industrial activities that originate from the site after construction activities have been completed and the site has undergone final stabilization;

   b. discharges that are mixed with sources of non-storm water other than discharges identified in Part III.A (Prohibition on Non-Storm Water Discharges) of this permit and in compliance with paragraph IV.D.5 (Non-Storm Water Discharges) of this permit;

c. storm water discharges associated with industrial activity that are subject to an existing NPDES individual or general permit or which are issued a permit in accordance with Part VI.N (Requiring an Individual Permit or an Alternative General Permit) of this permit. Such discharges may be authorized under this permit after an existing permit expires provided the existing permit did not establish numeric limitations for such discharges;

d. storm water discharges from construction sites that the Agency has determined to be or may reasonably be expected to be contributing to a violation of a water quality standard; and

e. storm water discharges that the Agency, at its discretion, determines are not appropriately authorized or controlled by this general permit.

f. storm water discharges to any receiving water specified under 35 Ill. Adm. Code 302.105(d) (6).

C. **Authorization.**

1. In order for storm water discharges from construction sites to be authorized to discharge under this general permit a discharger must submit a Notice of Intent (NOI) in accordance with the requirements of Part II below, using an NOI form provided by the Agency.

2. Where a new contractor is selected after the submittal of an NOI under Part II below, or where site ownership is transferred, a new Notice of Intent (NOI) must be submitted by the owner in accordance with Part II.

3. Unless notified by the Agency to the contrary, dischargers who submit an NOI in accordance with the requirements of this permit are authorized to discharge storm water from construction sites under the terms and conditions of this permit in 30 days after the date the NOI is received by the Agency.

4. The Agency may deny coverage under this permit and require submittal of an application for an individual NPDES permit based on a review of the NOI or other information.

Part II. NOTICE OF INTENT REQUIREMENTS

A. **Deadlines for Notification.**

1. To receive authorization under this general permit, a discharger must submit a completed Notice of Intent (NOI) in accordance with Part VI.G (Signatory Requirements) and the requirements of this Part in sufficient time to allow a 30 day review period after the receipt of the NOI by the Agency and prior to the start of construction. The completed NOI may be submitted electronically to the following email address: epa.constilr10swppp@illinois.gov

2. Discharges that were covered by the previous version of ILR10 are automatically covered by this permit. Where discharges associated with construction activities were initially covered under the previous version of ILR10 and are continuing, the Storm Water Pollution Prevention Plan must be updated/revised within 12 months of the effective date of this reissued permit, as necessary to ensure compliance with the provisions of the reissued ILR10. Updating of the SWPPP is not required if construction activities are completed and a Notice of Termination is submitted within 12 months of the effective date of this permit.

3. A discharger may submit an NOI in accordance with the requirements of this Part after the start of construction. In such instances, the Agency may bring an enforcement action for any discharges of storm water associated with industrial activity from a construction site that have occurred on or after the start of construction.

B. **Failure to Notify.** Dischargers who fail to notify the Agency of their intent to be covered, and discharge storm water associated with construction site activity to Waters of the State without an NPDES permit are in violation of the Environmental Protection Act and Clean Water Act.

C. **Contents of Notice of Intent.** The Notice of Intent shall be signed in accordance with Part VI.G (Signatory Requirements) of this permit by all of the entities identified in paragraph 2 below and shall include the following information:

1. The mailing address, and location of the construction site for which the notification is submitted. Where a mailing address for the site is not available, the location can be described in terms of the latitude and longitude of the approximate center of the facility to the nearest 15 seconds, or the nearest quarter section (if the section, township and range is provided) that the construction site is located in;

2. The owner's name, address, telephone number, and status as Federal, State, private, public or other entity;

3. The name, address and telephone number of the general contractor(s) that have been identified at the time of the NOI submittal;

4. The name of the receiving water(s), or if the discharge is through a municipal separate storm sewer, the name of the municipal operator of the storm sewer and the ultimate receiving water(s);

5. The number of any NPDES permits for any discharge (including non-storm water discharges) from the site that is currently authorized by an NPDES permit;

6. A description of the project, detailing the complete scope of the project, estimated timetable for major activities and an estimate of the number of acres of the site on which soil will be disturbed;

7. For projects that have complied with State law on historic preservation and endangered species prior to submittal of the NOI, through coordination with the Illinois Historic Preservation Agency and the Illinois Department of Natural Resources or through fulfillment of the terms of interagency agreements with those agencies, the NOI shall indicate that such compliance has occurred.

8. An electronic copy of the storm water pollution prevention plan that has been prepared for the site in accordance with Part IV of this permit. The electronic copy shall be submitted to the Agency at the following email address: epa.constilr10swppp@illinois.gov

9. Revised notice of intents shall be submitted for any substantial modifications to the project such as: address changes, new contractors, area coverage, additional discharges to waters of the state, or other substantial modifications.

D. **Where to Submit.**

Construction activities which discharge storm water that requires a NPDES permit must use an NOI form provided by the Agency. The applicable fee shall also be submitted. NOIs must be signed in accordance with Part VI.G (Signatory Requirements) of this permit. The NOI form may be submitted to the Agency in any of the following methods:

1. File electronically with digital signature at the following website address: http://dataservices.epa.illinois.gov/SWConstructionPermit/bowLogin.aspx

   Registration specific to the permittee is required in order to file electronically.

2. Submit complete NOI and SWPPP electronically to the following email address: epa.constilr10swppp@illinois.gov. Submit the NOI with original signature and fee by certified mail to the Agency at the following address:

   Illinois Environmental Protection Agency
   Division of Water Pollution Control, Mail Code #15
   Attention: Permit Section
   1021 North Grand Avenue East
   Post Office Box 19276
   Springfield, Illinois 62794-9276

E. **Additional Notification.** Construction activities that are operating under approved local sediment and erosion plans, land disturbance permits, grading plans, or storm water management plans, in addition to filing copies of the Notice of Intent in accordance with Part D above, shall also submit signed copies of the Notice of Intent to the local agency approving such plans in accordance with the deadlines in Part A above. See Part IV.D.2.d (Approved State or Local Plans). A copy of the NOI shall be sent to the entity holding an active General NPDES Permit No. ILR40 if the permittee is located in an area covered by an active ILR40 permit.

F. **Notice of Termination.** Where a site has completed final stabilization and all storm water discharges from construction activities that are authorized by this permit are eliminated, the permittee must submit a completed Notice of Termination that is signed in accordance with Part VI.G (Signatory Requirements) of this permit.

1. The Notice of Termination shall include the following information:

   a. The mailing address, and location of the construction site for which the notification is submitted. Where a mailing address for the site is not available, the location can be described in terms of the latitude and longitude of the approximate center of the facility to the nearest 15 seconds, or the nearest quarter section (if the section, township and range is provided) that the construction site is located in;

   b. The owner's name, address, telephone number, and status as Federal, State, private, public or other entity;

   c. The name, address and telephone number of the general contractor(s);

   d. The date when construction was completed and the site was stabilized; and

   e. The following certification signed in accordance with Part VI.G (Signatory Requirements) of this permit:

      "I certify under penalty of law that all storm water discharges associated with construction site activity from the identified facility that are authorized by NPDES general permit ILR10 have otherwise been eliminated. I understand that by submitting this notice of termination, that I am no longer authorized to discharge storm water associated with construction site activity by the general permit, and that discharging pollutants in storm water associated with construction site activity to Waters of the State is unlawful under the Environmental Protection Act and Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this notice of termination does not release an operator from liability for any violations of this permit or the Clean Water Act."

      For the purposes of this certification, elimination of storm water discharges associated with industrial activity means that all disturbed soils at the identified facility have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with construction activities from the identified site that are authorized by a NPDES general permit have otherwise been eliminated.

2. All Notices of Termination are to be sent to the Agency to the mailing address in Part II.D.1, using the form provided by the Agency, or electronically if the permittee submitted a Notice of Intent by electronic means.

Part III. SPECIAL CONDITIONS, MANAGEMENT PRACTICES, AND OTHER NON-NUMERIC LIMITATIONS

A. **Prohibition on Non-Storm Water Discharges.**

1. Except as provided in Part I paragraph B.2 and paragraphs 2, 3 or 4 below, all discharges covered by this permit shall be comprised entirely of storm water.

2. a. Except as provided in paragraph b below, discharges of materials other than storm water must be in compliance with a NPDES permit (other than this permit) issued for the discharge.

b. The following non-storm water discharges may be authorized by this permit provided the non-storm water component of the discharges is in compliance with Part IV.D.5 (Non-Storm Water Discharges): discharges from fire fighting activities; fire hydrant flushings; waters used to wash vehicles where detergents are not used; waters used to control dust; potable water sources including uncontaminated waterline flushings; landscape irrigation drainages; routine external building washdown which does not use detergents; pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; uncontaminated air conditioning condensate; springs; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

3. The following non-storm water discharges are prohibited by this permit: concrete and wastewater from washout of concrete (unless managed by an appropriate control), drywall compound, wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials, fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance, soaps, solvents, or detergents, toxic or hazardous substances from a spill or other release, or any other pollutant that could cause or tend to cause water pollution.

4. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are allowable if managed by appropriate controls.

B. **Discharges into Receiving Waters With an Approved Total Maximum Daily Load (TMDL):**

Discharges to waters for which there is a TMDL allocation for sediment or a parameter that addresses sediment (such as total suspended solids, turbidity, or siltation) are not eligible for coverage under this permit unless the owner/operator develops and certifies a SWPPP that is consistent with wasteload allocations in the approved TMDL. To be eligible for coverage under this general permit, operators must incorporate into their SWPPP any conditions and/or Best Management Practices applicable to their discharges necessary for consistency with the TMDL within any timeframes established in the TMDL. If a specific numeric waste load allocation has been established that would apply to the project's discharges, the operator must incorporate that allocation into its SWPPP and implement necessary steps to meet that allocation.

Please refer to the Agency website at: http://www.epa.state.il.us/water/tmdl/report-status.html

C. Discharges covered by this permit, alone or in combination with other sources, shall not cause or contribute to a violation of any applicable water quality standard.

Part IV. STORM WATER POLLUTION PREVENTION PLANS

A storm water pollution prevention plan shall be developed for each construction site covered by this permit. Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges associated with construction site activity from the facility. In addition, the plan shall describe and ensure the implementation of best management practices which will be used to reduce the pollutants in storm water discharges associated with construction site activity and to assure compliance with the terms and conditions of this permit. The permittee must implement the provisions of the storm water pollution prevention plan required under this part as a condition of this permit.

A. **Deadlines for Plan Preparation and Compliance.**

The plan shall:

1. Be completed prior to the start of the construction activities to be covered under this permit and submitted electronically to the Agency at the time the Notice of Intent is submitted; and

2. Provide for compliance with the terms and schedules of the plan beginning with the initiation of construction activities.

B. **Signature, Plan Review and Notification.**

1. The plan shall be signed in accordance with Part VI.G (Signatory Requirements), and be retained at the construction site which generates the storm water discharge in accordance with Part VI.E (Duty to Provide Information) of this permit.

2. Prior to commencement of construction, the permittee shall provide the plan to the Agency.

3. The permittee shall make plans available upon request from this Agency or a local agency approving sediment and erosion plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system. A list of permitted municipal separate storm sewer systems is available at: http://www.epa.state.il.us/water/permits/storm-water/ms4-status-report.pdf

4. The Agency may notify the permittee at any time that the plan does not meet one or more of the minimum requirements of this Part. Such notification shall identify those provisions of the permit which are not being met by the plan, and identify which provisions of the plan require modifications in order to meet the minimum requirements of this part. Within 7 days from receipt of notification from the Agency, the permittee shall make the required changes to the plan and shall submit to the Agency a written certification that the requested changes have been made. Failure to comply shall terminate authorization under this permit.

5. A copy of the letter of notification of coverage along with the General NPDES Permit for Storm Water Discharges from Construction Site Activities or other indication that storm water discharges from the site are covered under an NPDES permit shall be posted at the site in a prominent place for public viewing (such as alongside a building permit).

6. All storm water pollution prevention plans and all completed inspection forms/reports required under this permit are considered reports that shall be available to the public at any reasonable time upon request. However, the permittee may claim any portion of a storm water pollution prevention plan as confidential in accordance with 40 CFR Part 2.

C. **Keeping Plans Current.** The permittee shall amend the plan whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to Waters of the State and which has not otherwise been addressed in the plan or if the

storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified under paragraph D.2 below, or in otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with construction site activity. In addition, the plan shall be amended to identify any new contractor and/or subcontractor that will implement a measure of the storm water pollution prevention plan. Amendments to the plan may be reviewed by the Agency in the same manner as Part IV.B above. Any revisions of the documents for the storm water pollution prevention plan shall be kept on site at all times.

D. **Contents of Plan.** The storm water pollution prevention plan shall include the following items:

1. **Site Description.** Each plan shall provide a description of the following:

   a. A description of the nature of the construction activity or demolition work;

   b. A description of the intended sequence of major activities which disturb soils for major portions of the site (e.g. clearing, grubbing, excavation, grading, on-site or off-site stockpiling of soils, on-site or off-site storage of materials);

   c. An estimate of the total area of the site and the total area of the site that is expected to be disturbed by clearing, grubbing, excavation, grading, on-site or off-site stockpiling of soils and storage of materials, or other activities;

   d. An estimate of the runoff coefficient of the site after construction activities are completed and existing data describing the soil or the quality of any discharge from the site;

   e. A site map indicating drainage patterns and approximate slopes anticipated before and after major grading activities, locations where vehicles enter or exit the site and controls to prevent offsite sediment tracking, areas of soil disturbance, the location of major structural and nonstructural controls identified in the plan, the location of areas where stabilization practices are expected to occur, locations of on-site or off-site soil stockpiling or material storage, surface waters (including wetlands), and locations where storm water is discharged to a surface water; and

   f. The name of the receiving water(s) and the ultimate receiving water(s), and areal extent of wetland acreage at the site.

2. **Controls.** Each plan shall include a description of appropriate controls that will be implemented at the construction site and any off-site stockpile or storage area, The Illinois Urban Manual www.aiswcd.org/IUM or other similar documents shall be used for developing the appropriate management practices, controls or revisions of the plan. The plan will clearly describe for each major activity identified in paragraph D.1 above, appropriate controls and the timing during the construction process that the controls will be implemented. For example, perimeter controls for one portion of the site will be installed after the clearing and grubbing necessary for installation of the measure, but before the clearing and grubbing for the remaining portions of the site. Perimeter controls will be actively maintained and/or repaired until final stabilization of those portions of the site upward of the perimeter control. Temporary perimeter controls will be removed after final stabilization. The description of controls shall address as appropriate the following minimum components:

   a. **Erosion and Sediment Controls.** The permittee shall design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:

      (i) Control storm water volume and velocity within the site to minimize soil erosion;
      (ii) Control storm water discharges, including both peak flowrates and total storm water volume, to minimize erosion at outlets and to minimize downstream channel and streambank erosion;
      (iii) Minimize the amount of soil exposed during construction activity;
      (iv) Minimize the disturbance of steep slopes;
      (v) Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting storm water runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
      (vi) Provide and maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible; and
      (vii) Minimize soil compaction and, unless infeasible, preserve topsoil.

   b. **Stabilization Practices.** The storm water pollution prevention plan shall include a description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans should ensure that existing vegetation is preserved where practicable and that disturbed portions of the site are stabilized. Stabilization practices may include: temporarily seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, staged or staggered development, and other appropriate measures. A record of the dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated, shall be included in the plan. Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Stabilization of disturbed areas must be initiated within 1 working day of permanent or temporary cessation of earth disturbing activities and shall be completed as soon as possible but not later than 14 days from the initiation of stabilization work in an area. Exceptions to these time frames are specified as provided in paragraphs (i) and (ii) below:

      (i) Where the initiation of stabilization measures is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.
      (ii) On areas where construction activity has temporarily ceased and will resume after 14 days, a temporary stabilization method can be used. Temporary stabilization techniques and materials shall be described in the SWPPP.

   c. **Structural Practices.** A description of structural practices utilized to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Such practices may include silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. Structural practices should be placed on upland soils to the degree practicable. The installation of these devices may be subject to Section 404 of the CWA.

(i) The following design requirements apply to sediment basins if such structural practices will be installed to reduce sediment concentrations in storm water discharges:

a. When discharging from the sediment basin, utilize outlet structures that withdraw water from the surface in order to minimize the discharge.
b. Prevent erosion of the sediment basin using stabilization controls (e.g., erosion control blankets), at the inlet and outlet using erosion controls and velocity dissipation devices:
c. Sediment basins shall be designed to facilitate maintenance, including sediment removal from the basins, as necessary.

d. **Use of Treatment Chemicals.** Identify the use of all polymer flocculants or treatment chemicals at the site. Dosage of treatment chemicals shall be identified along with any information from any Material Safety Data Sheet. Describe the location of all storage area for chemicals. Include any information from the manufacturer's specifications. Treatment chemicals must be stored in areas where they will not be exposed to precipitation. The SWPPP must describe procedures for use of treatment chemicals and staff responsible for use/application of treatment chemicals must be trained on the established procedures.

e. **Best Management Practices for Impaired Waters.** For any site which discharges directly to an impaired water identified on the Agency's website for 303(d) listing for suspended solids, turbidity, or siltation the storm water pollution prevention plan shall be designed for a storm event equal to or greater than a 25-year 24-hour rainfall event. If required by federal regulations or the Illinois Urban Manual, the storm water pollution prevention plan shall adhere to a more restrictive design criteria. Please refer to the Agency's website at: (http://www.epa.state.il.us/water/tmdl/303d-list.html)

f. **Pollution Prevention.** The permittee shall design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

(i) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
(ii) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to storm water; and
(iii) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

g. **Other Controls.**

(i) Waste Disposal. No solid materials, including building materials, shall be discharged to Waters of the State, except as authorized by a Section 404 permit.
(ii) The plan shall ensure and demonstrate compliance with applicable State and/or local waste disposal, sanitary sewer or septic system regulations.
(iii) For construction sites that receive concrete or asphalt from off-site locations, the plan must identify and include appropriate controls and measures to reduce or eliminate discharges from these activities.
(iv) The plan shall include spill response procedures and provisions for reporting if there are releases in excess of reportable quantities.

h. **Best Management Practices for Post-Construction Storm Water Management.** Describe the measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. Structural measures should be placed on upland soils to the degree attainable. The installation of these devices may be subject to Section 404 of the CWA. This permit only addresses the installation of storm water management measures, and not the ultimate operation and maintenance of such structures after the construction activities have been completed and the site has undergone final stabilization. Permittees are responsible for only the installation and maintenance of storm water management measures prior to final stabilization of the site, and are not responsible for maintenance after storm water discharges associated with industrial activity have been eliminated from the site.

(i) The storm water pollution prevention plan and design and construction plans shall explicitly consider post-construction storm water management. Such practices may include: storm water detention structures (including wet ponds); storm water retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems (which combine several practices). The Permittee must plan for and put in place storm water BMPs to retain the greatest amount of post-development storm water runoff practicable given the site and project constraints by installing one or more of the Best Management Practices (BMPs) as described in the Illinois Urban Manual.

The storm water pollution prevention plan shall include an explanation of the technical basis used to select the practices to control pollution where post-construction flows will exceed predevelopment levels.

(ii) Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g. maintenance of hydrologic conditions, such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

(iii) Unless otherwise specified in the Illinois Urban Manual (2012), the storm water pollution prevention plan shall be designed for a storm event equal to or greater than a 25-year 24-hour rainfall event.

i. **Approved State or Local Plans.**

(i) The management practices, controls and other provisions contained in the storm water pollution prevention plan must be at least as protective as the requirements contained in the Illinois Urban Manual, 2012. Construction activities which discharge storm water must include in their storm water pollution prevention plan procedures and requirements specified in applicable sediment and erosion control plans or storm water management plans approved by local officials. Requirements specified in sediment and erosion control plans or site permits or storm water management site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI to be authorized to discharge under this permit, incorporated by reference and are enforceable under this permit. The plans shall include all requirements of this permit and include more stringent standards required by any local

approval. This provision does not apply to provisions of master plans, comprehensive plans, non-enforceable guidelines or technical guidance documents that are not identified in a specific plan or permit that is issued for the construction site.

(ii) Dischargers seeking alternative permit requirements are not authorized by this permit and shall submit an individual permit application in accordance with 40 CFR 122.26 at the address indicated in Part II.D (Where to Submit) of this permit, along with a description of why requirements in approved local plans or permits should not be applicable as a condition of an NPDES permit.

3. **Maintenance.**

a. The plan shall include a description of procedures to maintain in good and effective operating conditions, all erosion and sediment control measures and other Best Management Practices, including vegetation and other protective measures identified in the Storm Water Pollution Prevention Plan.

b. Where a basin has been installed to control sediment during construction activities, the Permittees shall keep the basin(s) in effective operating condition and remove accumulated sediment as necessary.

4. **Inspections.** Qualified personnel (provided by the permittee) shall inspect disturbed areas of the construction site that have not been finally stabilized, structural control measures, and locations where vehicles enter or exit the site at least once every seven calendar days and within 24 hours of the end of a storm or by the end of the following business or work day that is 0.5 inches or greater. Qualified personnel means a person knowledgeable in the principles and practices of erosion and sediment controls measures, such as a licensed Professional Engineer (P.E.), a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Erosion Sediment and Storm Water Inspector (CESSWI) or other knowledgeable person who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activities.

a. Inspections may be reduced to once per month when construction activities have ceased due to frozen conditions. Weekly inspections will recommence when construction activities are conducted, or if there is 0.5" or greater rain event, or a discharge due to snowmelt occurs.

b. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the plan shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

c. Based on the results of the inspection, the description of potential pollutant sources identified in the storm water pollution prevention plan in accordance with Part IV.D.1 (Site Description) of this permit and the pollution prevention control measures identified in the plan in accordance with Part IV.D.2 (Controls) of this permit shall be revised as appropriate as soon as practicable after such inspection to minimize the potential for such discharges. Such modifications shall provide for timely implementation of any changes to the plan and pollution prevention control measures within 7 calendar days following the inspection.

d. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph b above shall be made and retained as part of the storm water pollution prevention plan for at least three years from the date that the permit coverage expires or is terminated. All inspection reports shall be retained at the construction site. The report shall be signed in accordance with Part VI.G (Signatory Requirements) of this permit.

e. The permittee shall notify the appropriate Agency Field Operations Section office by email at: epa.swnoncomp@illinois.gov, telephone or fax within 24 hours of any incidence of noncompliance for any violation of the storm water pollution prevention plan observed during any inspection conducted, or for violations of any condition of this permit. The permittee shall complete and submit within 5 days an "Incidence of Noncompliance" (ION) report for any violation of the storm water pollution prevention plan observed during any inspection conducted, or for violations of any condition of this permit. Submission shall be on forms provided by the Agency and include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. Corrective actions must be undertaken immediately to address the identified non-compliance issue(s).

f. All reports of noncompliance shall be signed by a responsible authority as defined in Part VI.G (Signatory Requirements).

g. After the initial contact has been made with the appropriate Agency Field Operations Section Office, all reports of noncompliance shall be mailed to the Agency at the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Compliance Assurance Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

5. **Non-Storm Water Discharges.** Except for flows from fire fighting activities, sources of non-storm water listed in Part III.A.2 of this permit that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and insure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

E. **Additional requirements for storm water discharges from industrial activities other than construction, including dedicated asphalt plants, and dedicated concrete plants.** This permit may only authorize any storm water discharge associated with industrial activity from a construction site that is mixed with a storm water discharge from an industrial source other than construction, where:

1. The industrial source other than construction is located on the same site as the construction activity;

2. Storm water discharges associated with industrial activity from the areas of the site where construction activities are occurring are in compliance with the terms of this permit; and

3. Storm water discharges associated with industrial activity from the areas of the site where industrial activity other than construction are occurring (including storm water discharges from dedicated asphalt plants [other than asphalt emulsion facilities] and dedicated concrete plants) are in compliance with the terms, including applicable NOI or application requirements, of a different NPDES general permit or individual permit authorizing such discharges.

F. **Contractors.**

1. The storm water pollution prevention plan must clearly identify for each measure identified in the plan, the contractor(s) or subcontractor(s) that will implement the measure. All contractors and subcontractors identified in the plan must sign a copy of the certification statement in paragraph 2 below in accordance with Part VI.G (Signatory Requirements) of this permit. All certifications must be included in the storm water pollution prevention plan except for owners that are acting as contractors.

2. **Certification Statement.** All contractors and subcontractors identified in a storm water pollution prevention plan in accordance with paragraph 1 above shall sign a copy of the following certification statement before conducting any professional service at the site identified in the storm water pollution prevention plan:

> "I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit (ILR10) that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification."

The certification must include the name and title of the person providing the signature in accordance with Part VI.G of this permit: the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification is made.

Part V. RETENTION OF RECORDS

A. The permittee shall retain copies of storm water pollution prevention plans and all reports and notices required by this permit, records of all data used to complete the Notice of Intent to be covered by this permit and the Agency Notice of Permit Coverage letter for a period of at least three years from the date that the permit coverage expires or is terminated. This period may be extended by request of the Agency at any time.

B. The permittee shall retain a copy of the storm water pollution prevention plan and any revisions to said plan required by this permit at the construction site from the date of project initiation to the date of final stabilization.

Part VI. STANDARD PERMIT CONDITIONS

A. **Duty to Comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Illinois Environmental Protection Act and the CWA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. Failure to obtain coverage under this permit or an individual permit for storm water releases associated with construction activities is a violation of the Illinois Environmental Protection Act and the CWA.

B. **Continuation of the Expired General Permit.** This permit expires five years from the date of issuance. An expired general permit continues in force and effect until a new general permit or an individual permit is issued. Only those construction activities authorized to discharge under the expiring general permit are covered by the continued permit.

C. **Need to halt or reduce activity not a defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. **Duty to Provide Information.** The permittee shall furnish within a reasonable time to the Agency or local agency approving sediment and erosion control plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the municipal operator of the system, any information which is requested to determine compliance with this permit. Upon request, the permittee shall also furnish to the Agency or local agency approving sediment and erosion control plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the municipal operator of the system, copies of all records required to be kept by this permit.

F. **Other Information.** When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Agency, he or she shall promptly submit such facts or information.

G. **Signatory Requirements.** All Notices of Intent, storm water pollution prevention plans, reports, certifications or information either submitted to the Agency or the operator of a large or medium municipal separate storm sewer system, or that this permit requires be maintained by the permittee, shall be signed.

1. All Notices of Intent shall be signed as follows:

a. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (1) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or (2) any person authorized to sign documents that has been assigned or delegated said authority in accordance with corporate procedures;

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency, or (2) a senior executive officer

having responsibility for the overall operations of a principal geographic unit of the agency.

2. All reports required by the permit and other information requested by the Agency shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described above and submitted to the Agency.

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).

   c. **Changes to Authorization.** If an authorization under Part I.C (Authorization) is no longer accurate because a different individual or position has responsibility for the overall operation of the construction site, a new authorization satisfying the requirements of Part I.C must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.

   d. **Certification.** Any person signing documents under this Part shall make the following certification:

      "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. **Penalties for Falsification of Reports.** Section 309(c)(4) of the Clean Water Act provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or by both. Section 44(j)(4) and (5) of the Environmental Protection Act provides that any person who knowingly makes any false statement, representation, or certification in an application form, or form pertaining to a NPDES permit commits a Class A misdemeanor, and in addition to any other penalties provided by law is subject to a fine not to exceed $10,000 for each day of violation.

I. **Penalties for Falsification of Monitoring Systems.** The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by fines and imprisonment described in Section 309 of the CWA. The Environmental Protection Act provides that any person who knowingly renders inaccurate any monitoring device or record required in connection with any NPDES permit or with any discharge which is subject to the provisions of subsection (f) of Section 12 of the Act commits a Class A misdemeanor, and in addition to any other penalties provided by law is subject to a fine not to exceed $10,000 for each day of violation.

J. **Oil and Hazardous Substance Liability.** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under section 311 of the CWA.

K. **Property Rights.** The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

L. **Severability.** The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

M. **Transfers.** This permit is not transferable to any person except after notice to the Agency. The Agency may require the discharger to apply for and obtain an individual NPDES permit as stated in Part I.C (Authorization).

N. **Requiring an Individual Permit or an Alternative General Permit.**

1. The Agency may require any person authorized by this permit to apply for and/or obtain either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition the Agency to take action under this paragraph. Where the Agency requires a discharger authorized to discharge under this permit to apply for an individual NPDES permit, the Agency shall notify the discharger in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the discharger to file the application, and a statement that on the effective date of the individual NPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. Applications shall be submitted to the Agency indicated in Part II.D (Where to Submit) of this permit. The Agency may grant additional time to submit the application upon request of the applicant. If a discharger fails to submit in a timely manner an individual NPDES permit application as required by the Agency under this paragraph, then the applicability of this permit to the individual NPDES permittee is automatically terminated at the end of the day specified by the Agency for application submittal. The Agency may require an individual NPDES permit based on:

   a. information received which indicates the receiving water may be of particular biological significance pursuant to 35 Ill. Adm. Code 302.105(d)(6);

   b. whether the receiving waters are impaired waters for suspended solids, turbidity or siltation as identified by the Agency's 303(d) listing;

   c. size of construction site, proximity of site to the receiving stream, etc.

   The Agency may also require monitoring of any storm water discharge from any site to determine whether an individual permit is required.

2. Any discharger authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. In such cases, the permittee shall submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii), with reasons supporting the request, to the Agency at the address indicated in Part II.D (Where to Submit) of this permit. The request may be granted by issuance of any individual permit or an alternative general permit if the reasons cited by the permittee are adequate to support the request.

3. When an individual NPDES permit is issued to a discharger otherwise subject to this permit, or the discharger is authorized to discharge under an

alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual NPDES permit is denied to a discharger otherwise subject to this permit or the discharger is denied for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee remains in effect, unless otherwise specified by the Agency.

O. **State/Environmental Laws.** No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

P. **Proper Operation and Maintenance.** The permittee shall at all times properly operate and maintain all construction activities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

Q. **Inspection and Entry.** The permittee shall allow the IEPA, or an authorized representative upon presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated construction activity is located or conducted, or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

R. **Permit Actions.** This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

S. **Bypasses and Upsets.** The provisions of 40 CFR Section 122.41(m) & (n) are applicable and are hereby incorporated by reference.

Part VII. REOPENER CLAUSE

A. If there is evidence indicating potential or realized impacts on water quality due to any storm water discharge associated with industrial activity covered by this permit, the discharger may be required to obtain an individual permit or an alternative general permit in accordance with Part I.C (Authorization) of this permit or the permit may be modified to include different limitations and/or requirements.

B. Permit modification or revocation will be conducted according to provisions of 35 Ill. Adm. Code, Subtitle C, Chapter I and the provisions of 40 CFR 122.62, 122.63, 122.64 and 124.5 and any other applicable public participation procedures.

C. The Agency will reopen and modify this permit under the following circumstances:

1. the U.S. EPA amends its regulations concerning public participation;

2. a court of competent jurisdiction binding in the State of Illinois or the 7th Circuit Court of Appeals issues an order necessitating a modification of public participation for general permits; or

3. to incorporate federally required modifications to the substantive requirements of this permit.

Part VIII. DEFINITIONS

"Agency" means the Illinois Environmental Protection Agency.

"Best Management Practices" ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control construction site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Commencement of Construction or Demolition Activities" The initial disturbance of soils associated with clearing, grading, or excavating activities or other construction or demolition activities.

"Construction Activities" Earth disturbing activities, such as clearing, grading and excavation of land. For purposes of this permit, construction activities also means construction site, construction site activities, or site. Construction activities also include any demolition activities at a site.

"CWA" means Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. (96-483 and Pub. L. 97-117, 33 U.S.C. 1251 et seq.).

"Dedicated portable asphalt plant" A portable asphalt plant that is located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR 443.

"Dedicated portable concrete plant" A portable concrete plant that is located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

"Dedicated sand or gravel operation" An operation that produces sand and/or gravel for a single construction project.

"Director" means the Director of the Illinois Environmental Protection Agency or an authorized representative.

"Final Stabilization" means that all soil disturbing activities at the site have been completed, and either of the two following conditions are met:

(i) A uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or

(ii) Equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

For individual lots in residential construction, final stabilization means that either:

(i) The homebuilder has completed final stabilization as specified above, or

(ii) The homebuilder has established temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and informing the homeowner of the need for, and benefits of, final stabilization.

"Large and Medium municipal separate storm sewer system" means all municipal separate storm sewers that are either:

(i) Located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 CFR Part 122); or

(ii) Located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties (these counties are listed in Appendices H and I of 40 CFR Part 122); or

(iii) Owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the Director as part of the large or medium municipal separate storm sewer system.

"NOI" means notice of intent to be covered by this permit (see Part II of this permit.)

"Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharges. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

"Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff.

"Storm Water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

"Storm Water Associated with Industrial Activity" means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified in subparagraphs (i) through (x) of this subsection, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in subparagraph (xi), the term includes only storm water discharges from all areas listed in the previous sentence (except access roads) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally or municipally owned or operated that meet the description of the facilities listed in this paragraph (i)- (xi)) include those facilities designated under 40 CFR 122.26(a)(1)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi) of this paragraph);

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28, 29, 311, 32, 33, 3441, 373;

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations meeting the definition of a reclamation area under 40 CFR 434.11(l)) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator;

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but

limited to those classified as Standard Industrial Classification 5015 and 5093;

(vii) Steam electric power generating facilities, including coal handling sites;

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42, 44, and 45 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under subparagraphs (i)-(vii) or (ix)-(xi) of this subsection are associated with industrial activity;

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR 503;

(x) Construction activity including clearing, grading and excavation activities except: operations that result in the disturbance of less than one acre of total land area which are not part of a larger common plan of development or sale unless otherwise designated by the Agency pursuant to **Part I.B.1.**

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 31 (except 311), 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (i)-(x)).

"Waters" mean all accumulations of water, surface and underground, natural, and artificial, public and private, or parts thereof, which are wholly or partially within, flow through, or border upon the State of Illinois, except that sewers and treatment works are not included except as specially mentioned; provided, that nothing herein contained shall authorize the use of natural or otherwise protected waters as sewers or treatment works except that in-stream aeration under Agency permit is allowable.

"Work day" for the purpose of this permit, a work day is any calendar day on which construction activities will take place.

ILR10TMLPMTFINAL_7/29//2013

The following modifications have been made to the final permit from the previously issued General NPDES Permit ILR10:

1. I.B.1: A requirement that existing permittees may have to update/revise their Storm Water Pollution Prevention Plan (SWPPP). See also Section II.A.2 below

2. II.A.2: Provides that permittees must upgrade/revise their SWPPP within 12 months of the effective date of this permit. Projects which will be terminated within the next 12 months are not required to update/revise their SWPPP.

3. II.C.7: The requirement for consultation with the Illinois Historic Preservation Agency and the Illinois Department of Natural Resources was moved from Section I.C.3 to Section II.C.7.

4. II.C.9: Revised Notices of Intent for substantial modifications.

5. II.D: Where to submit Notices of Intent.

6. II.E: NOI shall be copied to local active MS4 permit holders.

7. II.F.1.d: Date of completion and stabilization now included in Notice of Termination (NOT).

8. II.F.2: Provides for electronic submission of NOT.

9. III.A.3: Prohibition of various non-storm water discharges in accordance with 40 CFR 450.

10. III.A.4: Allowance for groundwater dewatering in accordance with 40 CFR 450.

11. IV.B.5: Copy of Approval Letter must be posted at site.

12. IV.D.1.e: Inclusion of information concerning off-site stockpiling of soils or other materials in the site description.

13. IV.D.2.a: Delineation of erosion and sediment controls now specified in accordance with 40 CFR 450.

14. IV.D.2.b: Requirements for initiation of stabilization activities in accordance with 40 CFR 450.

15. IV.D.2.c: Design requirements for sediment basins added to permit.

16. IV.D.2.f: Pollution prevention measures now included in permit in accordance with 40 CFR 450.

17. IV.D.2.g: Provisions for control of other wastes now included in permit.

18. IV.D.2.h: Requirement to explicitly consider post-construction storm water management in the SWPPP.

19. IV.D.3.b. Requirement to keep sediment basins in operating condition.

20. IV.D.4.a: Clarified inspection requirements after construction has temporarily ceased or under frozen conditions.

21. IV.D.4.e: Specified that corrective actions must be undertaken immediately following an incident of non-compliance in accordance with 40 CFR 450.

22. VI.S: Bypass and Upsets provisions were added to the Standard Permit Conditions.

23. VIII: Definition of construction activities was added to permit.

24. VIII: Definition of work day was added to the permit.

25. General: References to the Illinois Environmental Protection Agency's Urban Manual were changed to Illinois Urban Manual (2012).

26. General: The word "facilities" in previous permit was changed to "construction activities" in the draft permit.

27. General: Various edits.

Illinois Environmental Protection Agency

Bureau of Water • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

Division of Water Pollution Control
Notice of Intent (NOI) for General Permit
to Discharge Storm Water Associated with Construction Site Activities

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Permit Section at the above address.

For Office Use Only

Permit No. ILR10 _____

OWNER INFORMATION

Company/Owner Name: Illinois Department of Natural Resources

Mailing Address: One Natural Resources Way Phone: 217-785-3334

City: Springfield State: IL Zip: 62702 Fax: 217-785-5014

Contact Person: Arlan R. Juhl E-mail: arlan.juhl@illinois.gov

Owner Type (select one) State

CONTRACTOR INFORMATION

MS4 Community: ☐ Yes ☐ No

Contractor Name: _____

Mailing Address: _____ Phone: _____

City: _____ State: ___ Zip: _____ Fax: _____

CONSTRUCTION SITE INFORMATION

Select One: ☒ New ☐ Change of information for: ILR10 _____

Project Name: Stratton Lock & Dam, Lock & Gate Structure Improvements County: McHenry

Street Address: 2910 W. State Park Road City: McHenry IL Zip: 60050

Latitude:	42	18	35.8	Longitude:	88	15	8.5	12	44N	8E
	(Deg)	(Min)	(Sec)		(Deg)	(Min)	(Sec)	Section	Township	Range

Approximate Construction Start Date May 1, 2014 Approximate Construction End Date Nov 1, 2016

Total size of construction site in acres: 18.1

If less than 1 acre, is the site part of a larger common plan of development?

☐ Yes ☐ No

Fee Schedule for Construction Sites:
Less than 5 acres - $250
5 or more acres - $750

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Has the SWPPP been submitted to the Agency? ☐ Yes ☐ No

(Submit SWPPP electronically to: epa.constilr10swppp@illinois.gov)

Location of SWPPP for viewing: Address: _____ City: _____

SWPPP contact information: Inspector qualifications:

Contact Name: _____

Phone: _____ Fax: _____ E-mail: _____

Project inspector, if different from above Inspector qualifications:

Inspector's Name: _____

Phone: _____ Fax: _____ E-mail: _____

IL 532 2104 WPC 623
Rev 5/10

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed $50,000 for the violation and an additional civil penalty of not to exceed $10,000 for each day during which the violation continues (415 ILCS 5/42) and may also prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

TYPE OF CONSTRUCTION (select one)

Construction Type Other

SIC Code: _____

Type a detailed description of the project:

The work consists of constructing: an extension of the existing lock, existing lockhouse renovation, construction of a new flood control structure with hinged crest gates, construction of a new maintenance docking pier, demolition of the existing sluice gate structure, installation of remote gate operation controls at the Stratton lockhouse to control the flood control gates at Algonquin, IL, restoration of the upstream right bank berm, resurfacing the existing lock access road and parking lot, and all associated site work.

HISTORIC PRESERVATION AND ENDANGERED SPECIES COMPLIANCE

Has the project been submitted to the following state agencies to satisfy applicable requirements for compliance with Illinois law on:

Historic Preservation Agency ☑ Yes ☐ No

Endangered Species ☑ Yes ☐ No

RECEIVING WATER INFORMATION

Does your storm water discharge directly to: ☐ Waters of the State or ☐ Storm Sewer

Owner of storm sewer system: State of Illinois

Name of closest receiving water body to which you discharge: Fox River

Mail completed form to: Illinois Environmental Protection Agency
Division of Water Pollution Control
Attn: Permit Section
Post Office Box 19276
Springfield, Illinois 62794-9276
or call (217) 782-0610
FAX: (217) 782-9891

Or submit electronically to: epa.constilr10swppp@illinois.gov

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a storm water pollution prevention plan and a monitoring program plan, will be complied with.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

_____ _____

Owner Signature: Date:

_____ _____

Printed Name: Title:

INSTRUCTIONS FOR COMPLETION OF CONSTRUCTION ACTIVITY NOTICE OF INTENT (NOI) FORM

Submit original, electronic or facsimile copies. Facsimile and/or electronic copies should be followed-up with submission of an original signature copy as soon as possible. Please write "copy" under the "For Office Use Only" box in the upper right hand corner of the first page.

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Permit Section at:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Permit Section
Post Office Box 19276
Springfield, Illinois 62794-9276
or call (217) 782-0610
FAX: (217) 782-9891

Or submit electronically to: epa.constilr10swppp@illinois.gov

Reports must be typed or printed legibly and signed.

Any facility that is not presently covered by the General NPDES Permit for Storm Water Discharges From Construction Site Activities is considered a new facility.

If this is a change in your facility information, renewal, etc., please fill in your permit number on the appropriate line, changes of information or permit renewal notifications do not require a fee.

NOTE: FACILITY LOCATION IS NOT NECESSARILY THE FACILITY MAILING ADDRESS, BUT SHOULD DESCRIBE WHERE THE FACILITY IS LOCATED.

Use the formats given in the following examples for correct form completion.

	Example	Format
Section	12	1 or 2 numerical digits
Township	12N	1 or 2 numerical digits followed by "N" or "S"
Range	12W	1 or 2 numerical digits followed by "E" or "W"

For the Name of Closest Receiving Waters, do not use terms such as ditch or channel. For unnamed tributaries, use terms which include at least a named main tributary such as "Unnamed Tributary to Sugar Creek to Sangamon River."

Submission of initial fee and an electronic submission of Storm Water Pollution Prevention Plan (SWPPP) for Initial Permit prior to the Notice of Intent being considered complete for coverage by the ILR10 General Permits. Please make checks payable to: Illinois EPA at the above address.

Construction sites with less than 5 acres of land disturbance - fee is $250.

Construction sites with 5 or more acres of land disturbance - fee is $750.

SWPPP should be submitted electronically to: epa.constilr10swppp@illinois.gov When submitting electronically, use Project Name and City as indicated on NOI form.

Illinois Environmental Protection Agency

Bureau of Water • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

Division of Water Pollution Control
NOTICE OF TERMINATION (NOT)
of Coverage under the General Permit for Storm Water Discharges Associated with Construction Site Activities

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Permit Section at the above address.

Permit No. ILR10 _____

OWNER INFORMATION

Owner Name: Illinois Department of Natural Resources

Owner Type (select one) State

Mailing Address: One Natural Resources Way Phone: 217/785-3334

City: Springfield State: IL Zip: 62702 Fax: 217/785-5014

Contact Person: Arlan R. Juhl E-mail: arlan.juhl@illinois.gov

CONTRACTOR INFORMATION

Contractor Name: _____

Mailing Address: _____ Phone: _____

City: _____ State: ____ Zip: _____ Fax: _____

CONSTRUCTION SITE INFORMATION

Facility Name: Stratton Lock & Dam

Street Address: 2910 W. State Park Road

City: McHenry IL Zip: 60050 County: McHenry

NPDES Storm Water General Permit Number: ILR10 _____

Latitude:	42	18	35.8	Longitude:	88	15	8.5	12	44N	8E
	(Deg)	(Min)	(Sec)		(Deg)	(Min)	(Sec)	Section	Township	Range

DATE PROJECT HAS BEEN COMPLETED AND STABILIZED: _____

NOTE: Coverage under this permit cannot be terminated without the completion date.

I certify under penalty of law that disturbed soils at the identified facility have been finally stabilized or that all storm water discharges associated with industrial activity from the identified facility that are authorized by an NPDES general permit have otherwise been eliminated. I understand that by submitting this notice of termination, that I am no longer authorized to discharge storm water associated with industrial activity by the general permit, and that discharging pollutants in storm water associated with industrial activity to Waters of the State is unlawful under the Environmental Protection Act and the Clean Water Act where the discharge is not authorized by an NPDES Permit.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

_____ _____

Owner Signature: Date:

Mail completed form to: Illinois Environmental Protection Agency
Division of Water Pollution Control, Attn: Permit Section
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

(Do not submit additional documentation unless requested)

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed $50,000 for the violation and an additional civil penalty of not to exceed $10,000 for each day during which the violation continues (415 ILCS 5/42) and may also prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

IL 532 2102
WPC 621 Rev 12/11

GUIDELINES FOR COMPLETION OF NOTICE OF TERMINATION (NOT) FORM

Please adhere to the following guidelines:

Submit original, electronic or facsimile copies. Facsimile and/or electronic copies should be followed-up with submission of an original signature copy as soon as possible.

Submit completed forms to:

Illinois Environmental Protection Agency
Division of Water Pollution Control, Attn: Permit Section
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
or call (217) 782-0610
FAX: (217) 782-9891

Or submit electronically to: epa.constilr10swppp@illinois.gov

Reports must be typed or printed legibly and signed.

NOTE: FACILITY LOCATION IS NOT NECESSARILY THE FACILITY MAILING ADDRESS, BUT SHOULD DESCRIBE WHERE THE FACILITY IS LOCATED.

Use the formats given in the following examples for correct form completion.

	Example	Format
Section	12	1 or 2 numerical digits
Township	12N	1 or 2 numerical digits followed by "N" or "S"
Range	12W	1 or 2 numerical digits followed by "E" or "W"

Final stabilization has occurred when:

(a) all soil disturbing activities at the site have been completed;

(b) a uniform perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas not covered by permanent structures; or

(c) equivalent permanent stabilization measures have been employed.

McHENRY – LAKE COUNTY
SOIL & WATER
CONSERVATION DISTRICT

1648 South Eastwood Dr., Woodstock, Illinois 60098 (815) 338-0099 ext. 3 Fax (815) 338-7731

December 17, 2013

Ted Montrey, P.E., S.E.
Illinois Department of Natural Resources
Office of Water Resources
One Natural Resources Way
Springfield, IL 62702

Dear Mr. Montrey,

I reviewed the erosion control plans and narrative for Stratton Lock and Dam project. These plans sufficiently address erosion control issues for your project. As with any erosion control plan, changes may be needed as field and weather conditions change. I will retain these plans for inspection purposes however if any major changes are made to the plans you will need to inform me of those changes. Please notify this office when construction begins so we can schedule appropriately for inspections

If you have any questions please feel free to contact me at (815)-338-0099 x3 or email at ed.weskerna@mchenryswcd.org

Sincerely,

Ed Weskerna
District Manager

cc: Soren Hall, ACOE Project Manager

Requirements for In-stream Construction Activities

The contractor shall contact the Corps with a proposed cofferdam plan that meets the standards listed below. The Corps will approve a cofferdam plan which meets these erosion and sediment control standards. Means and methods for completing work within a waterway must be approved by the Corps prior to the commencement of work. However, it is incumbent upon the contractor to ensure that all cofferdams are constructed to allow the passage of high flows, maintain downstream flows, and withstand anticipated erosive forces.

The following definitions apply to these notes:

Cofferdam: a temporary structure within a waterway or body of water designed to provide a dry work area for temporary construction activities and contain disturbed soil and/or suspended sediments.

In-stream work area: work occurring at or below the ordinary high water mark (OHWM) of a waterway or the normal water level (NWL) of abutting wetlands, including adjacent uplands.

Dewatering: the removal of water with the purpose of creating a dry work area for temporary construction activities.

Work within a waterway must meet the following standards:

1. Work in the waterway should be timed to take place during low or no-flow conditions. Low flow conditions are flow at or below the normal water elevation.

2. Water shall be isolated from the in-stream work area using a cofferdam constructed of non-erodible materials (steel sheets, aqua barriers, rip rap and geotextile fabric, etc.). Earthen cofferdams are not permissible.

3. Work may not be performed in the water, except for the placement of the materials necessary for the construction of the cofferdam. The cofferdam must be constructed from the upland area and no equipment may enter the water at any time. If the installation of the cofferdam cannot be completed from shore and access is needed to reach the area to be coffered, other measures, such as the construction of a causeway, will be necessary to ensure that equipment does not enter the water. Once the cofferdam is in place and the isolated area is dewatered, equipment may enter the coffered area to perform the required work.

4. If bypass pumping is necessary, the intake hose shall be placed on a stable surface or floated to prevent sediment from entering the hose. The bypass discharge shall be placed on a non-erodible, energy dissipating surface prior to rejoining the stream flow and shall not cause erosion. Filtering of bypass water is not necessary unless the bypass water has become sediment-laden as a result of the current construction activities.

5. During dewatering of the coffered area, all water must be filtered to remove sediment. Possible options for sediment removal include baffle systems, anionic polymers, dewatering bags, or other appropriate methods. Water shall have sediment removed prior to being re-introduced to the downstream waterway. A stabilized conveyance from the dewatering device to the waterway must be identified. Discharge water is considered clean if it does not result in a visually identifiable degradation of water clarity.

6. The portion of the side slope that is above the observed water elevation shall be stabilized as specified in the plans prior to accepting flows. The substrate and toe of slope that has been disturbed due to construction activities shall be restored to pre-construction conditions and fully stabilized prior to accepting flows.

ACCEPTANCE TESTING OF ELECTRICAL SYSTEMS

GENERAL

I. Section includes testing and verification of all new electrical systems and controls:

A. Wire and cables.

B. Wiring Devices.

C. Motors.

D. Motor Controls.

E. Panelboards & Switchboards.

F. Disconnects.

II. Reference Standards:

A. InterNational Electrical Testing Association, Inc. (NETA):

1. Acceptance Testing Specifications.

III. Submittals

A. Test Report: Submit three (3) copies of acceptance test report.

1. Provide the following information on the report cover:

a. Project name.
b. Date.
c. Facility name and address.
d. Owner's name and address (if different than facility name & address).
e. Contractor's name and address.
f. Testing firm's name and address (if different than contractor).
g. Engineer's name and address.

2. Submit test reports for each piece of equipment tested.
3. Separate results from each test into separate sections.

MATERIAL REQUIREMENTS

I. Materials

A. Provide test equipment, temporary wiring, and materials required to perform tests.

CONSTRUCTION REQUIREMENTS

I. Tests

A. 600 Volt Cable

1. Tested for proper phasing.
2. Provide insulation resistance test on all conductors in feeders.

B. Wiring Devices

1. 20 amp 125 volt receptacles shall be tested with a receptacle circuit tester for proper connection of ground wire, correct polarity, and faults.
2. Voltage at the end of each circuit over 100 foot in length shall be checked and recorded while under a 1600 W resistive load. Load test shall be performed at farthest receptacle.
3. Special configuration receptacles shall be checked for proper phase connections, ground continuity and voltage.

C. Motors

1. Inspected for damage, moisture, alignment, lubrication, oil leaks, and phase identification.
2. Tested for correct rotation. Where reverse rotation could damage equipment, the motor shall be mechanically uncoupled before testing.
3. Pass an insulation resistance test with the windings at ambient temperature.

    a. Three phase motor test shall be applied between all phases tied together and ground.
    b. Single phase motor test shall be applied between phase and neutral conductor tied together and ground.
    c. Insulation resistance test parameters:

	Induction Motor Type	Test Voltage	Min. Acceptable Resistance (MOhms)
1)	Three Phase	500	2
2)	Single Phase	500	1

    d. Non-induction type motors and special application motors shall have insulation tested as recommended by the motor manufacturer.

4. Operating load tests shall be run on all motors and the individual phase current readings taken.
5. Motor shall be run long enough to prove satisfactory performance under operating load, including but not limited to: temperature, lubrication, alignment and vibration.

D. Motor Controls:

1. Voltages shall be verified to assure that proper voltage is being fed to motor controller and control circuit elements before energization of starters.
2. Operate motor disconnect to assure that wiring of circuitry properly energizes and de-energizes to starter.
3. Motor wiring shall be checked for proper phase connections and motor rotation.

4. Check and record motor running full load current for all 3/4 hp and larger motors; verify with motor nameplate ratings.
5. Submit test report showing motor name, nameplate voltage, phase, HP, nameplate full load amps, actual running full load amps, fuse size used, size of overload heaters elements installed or overload relay settings, and disconnect and starter size installed.

E. Panelboards and Switchboards:

1. A complete record of the current in each phase feeder to each piece of equipment from switchboards and panelboards shall be made under full load.
2. A complete operational test shall be made of all switchboards and distribution panelboards to assure that equipment is in proper operating condition.
3. Ground connections shall be tightly secured and tested for continuity prior to energization.
4. Switchboard bus structure shall have insulation resistance test prior to energization.

    a. Care shall be exercised so as not to damage other equipment in switchboard.
    b. All switches and circuit breakers shall be opened to prevent damage to connected loads.

F. Disconnects:

1. Given an operational test.
2. Voltages on line and load side of all disconnects shall be tested to assure that proper voltage is being applied to terminals.

G. Provide ground electrode resistance test as specified in Secondary Grounding special provision.

II. Field Quality Control

A. Any unusual conditions shall be called to the attention of the Engineer.

B. Do not subject any equipment containing electronic components to high voltages required for insulation resistance tests.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. GATE STRUCTURE – ELECTRICAL WORK as shown on the Electrical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

3. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

4. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. GATE STRUCTURE – ELECTRICAL WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

3. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

4. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION ACCEPTANCE TESTING OF ELECTRICAL SYSTEMS

AIR DISTRIBUTION

GENERAL

I. Provision Includes:

A. Ductwork, fittings, dampers, hangers, accessories and insulation.

B. Access panels/doors.

C. Exhaust fans, diffusers, dampers and accessories.

D. Intake louvers, relief hoods, and intake hoods.

II. Submittals

A. Product Data: Submit manufacturer's published product data for all items, including but not limited to

1. Performance data
2. Capacity data
3. Sound data
4. Operating characteristics
5. Electrical data
6. Dimensions
7. Connection sizes and locations
8. Unit weights
9. Efficiencies
10. Accessories

B. Operation and Maintenance Manual: Submit manufacturer's installation instructions and operation and maintenance data.

III. Regulatory Requirements

A. Fire Prevention Code of Illinois.

B. Illinois Health Department.

C. SMACNA.

D. ASHRAE.

E. IMC - International Mechanical Code with latest supplements.

F. National Fire Prevention Association.

IV. Delivery, Storage and Handling

A. Deliver and store products in factory wrapped packages which properly protect devices against weather, damage and dirt.

B. Handle all equipment carefully to avoid damage to motors, components, enclosures and finishes.

C. Do not install damaged units; replace and return damaged units to manufacturer.

MATERIAL REQUIREMENTS

I. Acceptable Products: See schedules on Drawings.

II. Intake Louvers:

A. Intake louvers shall be extruded aluminum as noted on Drawings.

B. Louver blades and frames shall be 0.125" thick 6063-T5 alloy aluminum extensions, frames to be flange mounted, caulked in place as required to make watertight.

C. Insect screens to be in extruded aluminum "U" frames, securely fastened to the interior of the unit.

D. All louvers must be weatherproofed with face velocity up to 575 FPM. All tests are to consider both free-falling rain and water running down a wall and passing over the face of the louver.

E. Anodized finish – color as selected by Engineer from Manufacturer's standard finish options.

III. Low Pressure Ductwork Type 1

A. Type 1 ductwork shall be constructed of galvanized steel and shall be constructed in accordance with the recommendations of the latest editions of the ASHRAE and SMACNA handbooks.

B. All ductwork shall be sealed along traverse and longitudinal seams.

C. All ductwork shall be beaded or cross broke to stiffen surfaces – regardless of size.

D. Ductwork Schedule

	Area	Purpose	Type	Joints
1.	General	Exhaust Air Mains	1	Ductmate Or Slip & Drive

IV. Duct Accessories

A. Orifices, Elbows and Fittings: All orifices, elbows and fittings shall be installed as indicated on the Drawings and be furnished by same manufacturer as ductwork.

B. Duct Access Doors:

1. Access panels as shown on the Drawing or required shall be constructed of the same material as the duct they are mounted in.

2. Panels shall be of double wall construction of material at the same gauge or greater than the ductwork in which it is mounted.
3. Access panels shall be mounted in matching frames which are flanged for mounting into ductwork.
4. Latches shall be cam type with at least two latch for each 4' of door perimeter set on equidistant centers around the door perimeter, with a minimum of two latches on opposite sides of the panel. Full length doors shall have piano type hinge and two cam lock closures.
5. Access doors for M.O.D.'s shall have a visual panel for inspection.
6. Access doors shall be 1" thick and packed inside with glass fiber insulation.
7. Acceptable Products:

	Manufacturers	Models
a.	Karp	C.D.
b.	C.E. Sparrow	CAD
c.	Air Balance	Fire Seal

C. Turning Vanes:

1. Turning vanes shall be double walled airfoil type constructed of the same material as the duct.
2. Vanes shall be mounted on runners and shall provide right angle deflection of air uniformly over the entire duct area.
3. Acceptable Products:

	Manufacturers	Models
a.	Elgin	Vane Runner
b.	Tuttle & Bailey	Duct Turn
c.	Barber Coleman	Airturn

V. Motor Operated Dampers – Control Dampers

A. Low leakage thermally insulated blades unless otherwise specified, constructed of no less than 18 gauge-galvanized steel with stainless steel shafts and oilite bearings.

B. Dampers shall pass CFM shown on Drawings in full open position at no more than 0.10" W.G.

C. Damper blade arrangement shall be:

1. Open/Close: Parallel blade
2. Modulating: Opposed blades

D. Blades shall be insulated airfoil galvanized steel double skin construction.

E. Linkage shall be side mounted out of air stream.

F. Seals shall be extruded silicone rubber blade seals.

G. Blades shall be adjusted to provide no light leakage along blades longest dimension.

H. Installation locations required:

1. Exhaust Fans.
2. Exterior exhaust louvers.
3. Outside air intake louvers and intake hoods.

I. Contractor shall furnish and install MOD's as scheduled on drawings.

J. Caulk all seams and edges.

CONSTRUCTION REQUIREMENTS

I. General

A. Ductwork shall be erected such that it will not be deformed by structure, piping, conduit, other ductwork.

B. The approximate locations of equipment and ductwork shall be as shown on the Drawings. The Engineer reserves the right to change the location of the equipment or ductwork five feet in any direction without these changes being made the subject of any extra to the original Contract.

C. Ducts shall be run level except at rises or drops over or through obstructions.

D. Ducts shall be sized such that the inside dimension is that shown on Drawings. Allow for duct lining thickness.

II. Ductwork

A. All ductwork shall be field or shop fabricated in accordance with recommendations of the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).

B. All ducts shall be of inside size indicated on Drawings. Allow the duct liner insulation thickness to duct dimensions shown on drawings. In no case shall the Contractor change the indicated sizes of ductwork without written approval.

C. All seams in ductwork to be made absolutely tight against air leakage. Joints to be lapped with inside lap in direction of air travel. Sufficient joints shall be installed in ducts to take care of expansion and contraction. Longitudinal joints other than at corners of duct will not be accepted.

D. Turns in ducts to be constructed with square elbows.

E. Wherever shown on the Drawings, all 90° elbows shall be square with double bladed turning vanes, installed in the ducts, as recommended by the manufacturer and approved by the Engineer. The right angle turns shall provide right deflection of air uniformly over the entire duct area even in a transition elbow.

F. Wherever it is necessary to change the shape of the duct it shall be done gradually and the full area retained. Angle shall not exceed 30 degrees for any side of transitions.

G. The Contractor shall furnish and install airtight access doors, of the size required and where shown on Drawings, or wherever necessary to obtain access to all volume dampers, fire dampers, coils, controls, etc.

H. All ducts shall be properly braced, stiffened and/or cross broken such that no pulsation of rattling will occur. Bracing and stiffening materials or galvanized duct shall be of galvanized steel.

I. Where ducts pass through walls, which are in place before ducts are installed, furnish and install 18 gauge galvanized sleeves as wall is built. Sleeves to be 1" larger than outside of duct or duct insulation if insulated. If duct is in place before wall is built, wrap duct or duct insulation with 26 gauge galvanized sheet extending 1" each side of wall and held in place with wire. Where fire dampers are required, the ducts will be attached to fire damper collars at each side. Space between duct or duct insulation and sleeves shall be filled with fiberglass packed into place.

J. Do not hang ductwork from floor or roof metal decking. Provide supplemental steel to bridge structural members and hang from the supplemental steel.

III. Duct Access Door

A. Install duct access door with solid door at all duct mounted heating coils upstream to facilitate cleaning of coils.

B. Install duct access door with visual panel at each duct mounted M.O.D.

VI. Duct Leak Testing

A. Contractor shall test each main run and branch run of the supply, exhaust and return air ductwork either with permanent equipment or temporary equipment to provide a max. pressure test of 2" W.C. and to maintain pressure for a period of two (2) hours with a maximum allow leakage of 3%.

B. Contractor shall seal all joints, seams and connections to provide the max. 3% leakage allowed.

C. Upon failure of leakage test contractor shall inspect and reseal all leaks and retest until 3% allowed leakage is obtained.

D. Test all ductwork associated with:

1. Exhaust ductwork.

E. Do not air test outdoor air ductwork or combustion air ductwork.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – MECHANICAL WORK (HVAC) as shown on the Mechanical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – MECHANICAL WORK (HVAC) shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION – AIR DISTRUBUTION

AIR SYSTEMS TESTING, ADJUSTING, & BALANCING

GENERAL

I. Provision Includes testing, adjusting and balancing exhaust fans.

II. Job Conditions

A. The heating, ventilating, air conditioning equipment shall be completely installed and in continuous operation to accomplish the testing, adjusting and balancing work specified.

B. A testing, adjusting and balancing test shall be performed when outside conditions approximate design conditions for heating and cooling functions or when the system is operating at design capacity.

C. The Engineer will be present during testing and balancing to verify that specified procedures are followed.

III. QUALITY ASSURANCE

A. Employ INDEPENDENT CERTIFIED BALANCING CONTRACTOR only to perform testing and balancing work.

B. Submit evidence that the personnel who will perform the testing and balancing of the project systems are qualified personnel for review and approval by the Engineer prior to performing the work.

C. Submit a list of completed projects successfully tested and balanced by the submitted qualified personnel for review and approval, by the Engineer, prior to performing the work.

D. Perform corrective measures caused by faulty installation. Retest, readjust and rebalance system(s) until satisfactory results are achieved.

E. Qualified personnel are defined as personnel who have been certified by one of the following organizations:

1. AABC - Associated Air Balance Council.
2. Certified TBAB - Certified Testing, Balancing and Adjusting Bureau.
3. NEBB - National Environmental Balancing Bureau, Illinois Chapter.
4. SMARTA - Sheet Metal, Air Conditioning & Roofing Contractors Trade Association of Illinois.
5. TABIC - Test & Balancing Institute for Certification.

IV. SUBMITTALS

A. Submit Data Sheet on each item of testing equipment for Engineer approval and include name of device, manufacturer's name, model number, latest date of calibration and correction factors.

B. Submit report containing all test data and other related information recorded during testing and balancing, placed on appropriate forms for Engineer review and approval. Reports shall certify that the methods used and results achieved are as specified.

V. REVERIFICATION

A. Take instrument readings as directed.

B. Test points will be in normally accessible locations and randomly selected by Engineer.

MATERIAL REQUIREMENTS

I. AIR BALANCE INSTRUMENTS (Ranges shown are guides. Actual ranges used are subject to Engineer approval).

A. Velometer with probes and Pitot tube.

B. Rotating vane anemometer.

C. ASHRAE Standard Pitot tubes, stainless steel 5/16 in. outside diameter, lengths 18 in. and 36 in.

D. Magnahelic differential air pressure gages, 0 to 0.5", 0 to 1.0" and 0 to 5.0" water pressure ranges, each arranged as a portable unit for use with a standard Pitot tube.

E. Combination inclined-vertical portable manometer, range 0 to 5.0 " water.

F. Portable type hook gage, range 0 to 12 " water.

G. Portable flexible U-tube manometer, magnetic mounting clips, range 0 to 18" water.

H. Static pressure probe for induction unit.

I. Conical or pyramidal shaped hood.

II. System Performance Measuring Instruments

A. Insertion thermometers, with graduations at 0.5°F.

B. Sling psychrometer.

C. Tachometer, centrifugal type.

D. Revolution counter.

E. Clamp-On voltammeter.

F. Portable recorders for temperature and humidity.

CONSTRUCTION REQUIREMENTS

I. Air Systems.

A. Test, adjust and balance systems in accord with the following:

1. Preliminary:
   a. Identify and list size, type and manufacturer of all equipment to be tested, including air terminals. Inspect all system components for proper installation and operation.
   b. Use manufacturer's ratings for all equipment to make calculations except where field test shows ratings to be impractical.
   c. Verify that all instruments are accurately calibrated and maintained.

2. Exhaust System:
   a. Test, adjust and record supply return fan RPM to design requirements within the limits of mechanical equipment provided.
   b. Test and record motor voltage and running amperes including motor nameplate data and starter heater ratings.
   c. Make Pitot tube traverse of main supply, exhaust and outdoor air ducts, determine and record cfm at fans and adjust fans to design cfm.
   d. Test and record system static pressure, suction and discharge.
   e. Test and adjust system for design outside air, cfm.
   f. Make all required adjustments and changes in pulleys, belts and dampers or add balancing dampers required for correct balancing as recommended by the air balance and testing agency.

3. Distribution: Adjust zones or ducts to proper design cfm, supply and return.
4. Verification:
   a. Prepare summation of readings of observed cfm for each system, compare with specified cfm and verify that duct losses are within specified allowable range.
   b. Verify design cfm at fans as described above.

II. Automatic Control System

A. Testing organization shall verify all controls for proper calibration and list those controls requiring adjustment by temperature control system installer.

III. System Performance Report

A. After the conclusion of balancing operations, make temporary installation of portable recorders and simultaneously record temperatures and humidity during summer and winter conditions at representative locations in each system outside of building.

B. Engineer will direct test locations.

C. Make recordings during summer and winter for a seven-day period, continuous over a weekend and including at least one period of operation at outside conditions within 5°F wet bulb temperature of maximum summer design condition and within 10°F dry bulb temperature of minimum winter design condition.

D. Report of test results shall include original recording and two reproductions.

IV. Report Submittal

A. Fill in test results on appropriate forms.

B. Submit three certified copies of test reports to the Engineer for approval.

C. Include in report a list of instruments used and last date of calibration.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – MECHANICAL WORK (HVAC) as shown on the Mechanical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – MECHANICAL WORK (HVAC) shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION - AIR SYSTEMS TESTING, ADJUSTING, & BALANCING

ALUMINUM WINDOWS

GENERAL

This section includes aluminum windows for exterior locations at the Lockhouse and the Gate Structure.

I. ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.

C. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

II. INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranties.

III. WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.

1. Warranty Period:

a. Window: 10 years from date of Substantial Completion.
b. Glazing Units: Five years from date of Substantial Completion.
c. Aluminum Finish: 10 years from date of Substantial Completion.

MATERIAL REQUIREMENTS

I. MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. EFCO Corporation; a Pella company.
2. Graham Architectural Products Corp.
3. Kawneer North America; an Alcoa company.
4. TRACO.
5. YKK AP America Inc.

II. WINDOW PERFORMANCE REQUIREMENTS

A. Product Standard: AAMA/WDMA/CSA 101/I.S.2/A440.

1. Minimum Performance Class: CW.
2. Minimum Performance Grade: 30.

B. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.30 Btu/sq. ft. x h x deg F (1.71 W/sq. m x K)

C. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.40.

D. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, showing a CRF of 45.

III. ALUMINUM WINDOWS

A. Operating Types: As indicated on Drawings.

B. Frames and Sashes: Thermally broken aluminum extrusions complying with AAMA/WDMA/CSA 101/I.S.2/A440.

C. Insulating-Glass Units: ASTM E 2190.

1. Glass: ASTM C 1036, Type 1, Class 1, q3.

a. Tint: Gray
b. Kind: Large Missile Impact Resistant.

2. Lites: Two.
3. Filling: Fill space between glass lites with air.
4. Low-E Coating: Pyrolytic on second surface.

D. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.

E. Hardware, General: Manufacturer's standard corrosion-resistant hardware sized to accommodate sash weight and dimensions.

1. Exposed Hardware Color and Finish: As selected by Engineer from manufacturer's full range.

F. Horizontal-Sliding Window Hardware:

1. Sill Cap/Track: Designed to comply with performance requirements indicated and to drain to the exterior.
2. Locks and Latches: Operated from the inside only.
3. Roller Assemblies: Low-friction design.

G. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

H. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

IV. ACCESSORIES

A. Subsills: Thermally broken, extruded-aluminum subsills in configurations indicated on Drawings.

B. Column Covers: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

C. Interior Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

D. Panning Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

E. Receptor System: Two-piece, snap-together, thermally broken, extruded-aluminum receptor system that anchors windows in place.

V. INSECT SCREENS

A. General: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.

1. Type and Location: Half, outside for sliding sashes.

B. Aluminum Frames: Complying with SMA 1004 or SMA 1201.

C. Glass-Fiber Mesh Fabric: 20-by-20 or 20-by-30 mesh complying with ASTM D 3656.

1. Mesh Color: Manufacturer's standard.

VI. FABRICATION

A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

B. Glaze aluminum windows in the factory.

C. Weather strip each operable sash to provide weathertight installation.

D. Provide weep holes and internal passages to conduct infiltrating water to exterior.

E. Provide water-shed members above side-hinged sashes and similar lines of natural water penetration.

F. Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building

deflections, as indicated. Provide mullions and cover plates capable of withstanding design wind loads of window units.

G. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

VII. ALUMINUM FINISHES

A. Baked-Enamel Finish: Thermosetting, modified-acrylic or polyester enamel primer/topcoat system complying with AAMA 2603, except with a minimum dry film thickness of 1.5 mils, medium gloss.

1. Color: White.

CONSTRUCTION REQUIREMENTS

I. INSTALLATION

A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.

B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.

D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

E. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.

F. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

G. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

METHOD OF MESUREMENT

This work will be measured for payment as indicated for the items noted below:

A. GATE STRUCTURE – WINDOWS shall be measured for payment each window installed.

B. LOCKHOUSE – WINDOWS shall be measured for payment each window installed.

BASIS OF PAYMENT

This work will be paid for according to the following:

A. GATE STRUCTURE – WINDOWS shall be paid for at the contract unit price for each window furnished and installed, including, but not limited to, all labor, materials, supports, hardware, tools and equipment required to completed the installation as shown on the plans.

B. LOCKHOUSE – WINDOWS shall be paid for at the contract unit price for each window furnished and installed, including, but not limited to, all labor, materials, supports, hardware, tools and equipment required to complete the installation as shown on the plans.

END OF SPECIAL PROVISION – ALUMINUM WINDOWS

BASIC ELECTRICAL MATERIALS AND METHODS

GENERAL

I. Provision Includes:

A. Raceways.

B. Wire & Cable.

C. Boxes.

D. Sealing.

E. Supporting devices.

F. Concrete housekeeping pads.

II. References.

A. American National Standards Institute (ANSI):

1. C80.1 – Specification for Rigid Steel Conduit, Zinc-Coated.
2. C80.3 – Specification for Electrical Metallic Tubing, Zinc-Coated.
3. C80.4 – Specification for Fittings for Rigid Metal Conduit and Electrical Metallic Tubing.

B. National Fire Protection Association (NFPA):

1. NFPA 70 – National Electrical Code (NEC).
2. NFPA 101 – Life Safety Code.

C. National Electrical Manufacturers Association (NEMA):

1. FB-1 – Conduit and Cable Assemblies.
2. OS-1 – Sheet Steel Outlet Boxes, Device Boxes, Covers and Box Supports.
3. TC-2 – Electrical Plastic Tubing and Conduit.
4. TC-3 – PVC Fittings for Use With Rigid PVC Conduit and Tubing.
5. WC-5 – Thermoplastic Insulated Wire and Cable
6. WD-1 – General Purpose Wiring Devices
7. WD-2 – Semi-conductor dimmers for incandescent lamps
8. WD-5 – Special Purpose Wiring Devices
9. 250 – Enclosures for Electrical Equipment

D. Underwriters Laboratories, Inc. (UL):

1. All materials UL listed and labeled.

E. State of Illinois:

1. Illinois Steel Products Procurement Act, as amended.

III. Submittals

A. Product Data: No submittal required when using specified materials.

B. Submit project record documents for electrical installations.

IV. Delivery, Storage and Handling

A. Materials shall be suitably packaged by manufacturer to prevent damage during shipment. Damaged materials will not acceptable for use.

B. Store materials on site in clean, dry storage area; when outside, elevated above grade and enclosed with durable watertight wrapping.

C. Handle all materials carefully to prevent damage. Minor scratches, marks or blemishes to finish shall be repaired to satisfaction of Engineer.

V. Project Conditions

A. If the existing conditions prohibit proper installation or installation as shown on the drawings, Contractor shall contact the Engineer for a solution.

B. Contractor shall protect all electrical items and shall replace items which are damaged during construction.

MATERIAL REQUIREMENTS

I. Raceways

A. Conduit:

1. Steel Rigid Metal (RGS): ANSI C80.1 & UL-6.
2. Intermediate Metal Conduit (IMC): ANSI C80.1 & UL-6.
3. Rigid Non-Metallic (PVC): NEMA TC-2.
4. Steel Flexible Metal (FLEX): UL-1.
5. Steel Liquidtight Flexible (LT FLEX): UL-1.
6. Rigid Aluminum (AL): ANSI C80.5, UL-6A, Type 6063 Alloy, Temper T-1.

B. Tubing:

1. Steel Electrical Metallic (EMT): ANSI C80.3 & UL 797.

C. Surface Metal Raceway:

1. Sizes and channels as shown
2. Galvanized steel with snap-on covers
3. Mounting screw knockouts in base approximately 8 inches on center.
4. Prime coated, ready for field painting.

D. Fittings:

1. RGS and IMC:

a. ANSI C80.4.
b. Locknuts; steel or malleable iron.
c. Bushings; insulating or insulated throat type.
d. Couplings; threaded or gland compression malleable iron type.
e. **Set screw or indenter type fittings not acceptable.**

2. EMT:

a. Couplings and Connectors; steel compression type.
b. **Set screw or indented type fittings not acceptable**.

3. FLEX: Malleable iron, threadless, squeeze clamp type for non-jacketed conduit.
4. LT FLEX: Steel or malleable iron compression type with insulated throat and "O" ring assembly.
5. AL:

a. Type 6063 Alloy, Temper T-1
b. Threaded fitting only.
c. **Set screw or indented type fittings not acceptable**.

II. Sealing

A. Thermal Seal:

1. Seal penetrations of thermally insulated equipment or rooms to prevent heat transfer.
2. Seal exterior of raceway with fiberglass.
3. Seal interior of raceway with duct sealing compound at entry to equipment or room.

B. Water Seal:

1. Seal penetrations of perimeter walls or floors below grade to prevent entry of water.
2. Use materials compatible with wall or floor construction and approved by Engineer.

III. Wire And Cable

A. Building Wire:

1. 98% conductivity Copper only.
2. 600 Volt insulation, type THWN-2
3. Complying with UL-83 & ICEA S-61-402 or S-66-524.
4. Wire #10 and smaller solid conductors. Wire #8 and larger stranded conductors.
5. Branch Circuit Wiring:

a. Conductors sized in accord with NEC 75^{o}C Ampacity tables.
b. Minimum wire size shall be #12 AWG

c. Increase one (1) wire size when furthest outlet is greater than 75 feet from panelboard.

6. Wiring for systems other than power:

a. Comply with system manufacturer's standards.
b. Minimum wire size shall be #14 AWG unless otherwise specified.

B. Joints and Splices:

1. Wire No. 8 or smaller:

a. Compression or crimp type with insulating wrap cover
b. Insulated twist-on spring connector.

2. Wire No. 6 or larger:

a. Mechanical compression or bolted type connector covered with insulating tape or heat shrinkable insulation equal to conductor insulation.

3. Multi-conductor cable splices:

a. Crimp type butt connector for each conductor
b. Provided with a thermo-fit dual wall heat-shrink tube over each connector.
c. Provided with a heat-shrink submersible jacket over the entire cable assembly.

IV. Boxes

A. Pull and Junction Boxes:

1. NEC - 314 and U.L. 50.
2. Interior locations: minimum 14 gauge galvanized steel, prime coated in finished areas.
3. Exterior locations: Stainless Steel NEMA 4X.
4. Flush mounted pull boxes:

a. Overlapping cover with flush head security type retaining screws, prime-coated.
b. Overlap cover two inches all sides.
c. Provide two screw removal/insertion tools to Using Agency.

5. Surface mounted boxes:

a. Screw-on or hinged cover.
b. Provide silicon bronze standard retaining screws where accessible only to authorized personnel; security type in all other locations.
c. Screws spaced twelve inch maximum.

B. Outlet Boxes:

1. Interior boxes:

    a. U.L.514
    b. Hot dipped galvanized, 1.25 oz./sq.foot, sherardized or cadmium plated.
    c. Sheet steel with conduit knockouts, attached lugs for locating.

2. Exterior boxes or exposed interior in wet/damp locations:

    a. Cast aluminum.
    b. Deep type.
    c. Corrosion proof fasteners.
    d. Watertight, gasketed, threaded hubs.

3. For suspended or surface mounted fixtures:

    a. 4 inch octagonal or square according to devices used.
    b. Minimum of 1½ inch deep.
    c. Provided with fixture studs.
    d. Provided with ¾ inch minimum depth plaster rings on suspended ceilings.
    e. 4 inch octagonal or square for all exposed conduit work with fixture extension pan or deep fixture canopy to enclose the box.

4. For recessed fixtures:

    a. 4 inch octagonal or square.
    b. Minimum of 1½ inch deep.
    c. Provided with blank cover.

5. Switch and Receptacle Boxes:

    a. 4-11/16 inch square for up to two devices.
    b. Solid gang boxes for over two devices.
    c. Provided with ¾ inch minimum depth tile ring where used in exposed tile, concrete, block or paneled walls.
    d. Provided with ¾ inch minimum depth plaster ring where used in plastered walls.
    e. Provided with ½ inch raised galvanized device covers where used for exposed conduit work.

6. Provide corrosion resistant steel knockout closures for unused openings.

C. Conduit Bodies:

1. Metallic conduits:

    a. Galvanized cast metal of type, shape and size to fit location.
    b. Constructed with threaded conduit ends.

2. Non-metallic conduits:

a. PVC of type, shape and size to fit location.
b. Solvent-weld ends.

3. Provided with removable cover and corrosion resistant screws. Provide gaskets for wet locations.

D. Handholes:

1. Polymer concrete.
2. Suitable for direct bury use.
3. Dimensions as shown in schedule on drawings.
4. Tier 22 unless specifically noted otherwise in schedule on drawings.
5. Provide complete with matching cover.

V. Supporting Devices

A. Suspended conduits less than 1 inch:

1. Exposed construction: provide strap type hangers supported from beam clamps or threaded rods.
2. Conduits suspended above ceilings:

a. Anchor to building structural members.
b. When span exceeds NEC limits, provide channel steel between framing members.
c. Tie wiring of conduit to air ducts, piping, or other mechanical systems not permitted.
d. Plumber's perforated strap not permitted.

B. Suspended Conduit 1 inch or larger:

1. Provide threaded rod with "U" type hangers for single conduit.
2. Provide trapeze hanger assemblies and threaded rod for two or more conduits.
3. Anchor threaded rod to inserts in concrete or beam clamp on steel structure.

C. Surface Mounted Conduit:

1. Provide one-hole galvanized steel straps for conduits 1 in. or less.
2. Provide clampbacks on exterior walls below grade or in wet areas.
3. For conduit larger than 1 in., use malleable iron pipe straps.
4. For multiple conduits, provide channel anchored to wall with conduit attached to channel with split pipe clamps.

D. Anchoring:

1. Hollow Masonry: Toggle bolts or spider type expansion anchors.
2. Solid Masonry: Lead expansion anchors or preset anchors.
3. Concrete: Self-drilling anchor or powder driver studs.
4. Metal: Machine screws, bolts or welded studs.
5. Wood: Wood screws.

VI. Non-Structural Concrete Housekeeping Pads

A. Concrete: Class SI (IDOT Section 1020).

B. Reinforcement shall be with 6 x 6 - W2.9 x W2.9 WWF placed mid depth in slab.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Execute work in a manner not to interfere with Department's operations.

B. Coordinate work regarding location and size of pipes, raceways, ducts, openings, switches, and outlets so there is no interference between installation or progress of work.

C. Install all equipment with ample space allowed for removal, repair, or changes to equipment.

1. Provide ready accessibility to removable parts of equipment and to all wiring without moving equipment installed or already in place.
2. Provide access panels for all devices installed above non-accessible ceilings or within walls or partitions.

D. Provide sleeves for all electrical conduits passing through walls, partitions, ceilings and floors.

1. Provide sleeves of sufficient length to extend through full thickness of wall construction with ends flush.
2. Extend floor sleeves one inch above finish floor.

E. Coordinate installation of outlet boxes with other equipment:

1. In mechanical and electrical equipment spaces, expose ceiling outlets and conduit with due consideration to ventilating ducts and mechanical piping.
2. Where numerous ducts occur, install conduits and outlets after installation of ductwork complete.
3. Puncturing of duct work or hanging equipment such as light fixtures, ceiling hangers, conduits, etc. from duct work or piping is prohibited unless such electrical items directly serve a piece of equipment mounted directly on the mechanical system.

F. Where cutting is required to facilitate construction, patch and repair cut items to original state.

1. Do not cut structural work without prior written approval of Engineer.
2. Cut holes through concrete and masonry in new and existing structures with a diamond core drill or concrete saw.
3. Pneumatic hammer, impact electric, hand or manual hammer type drills not allowed except where permitted by Engineer because of limited work space.
4. Layout holes in advance.

G. Seal all floor, exterior wall and roof penetrations watertight.

1. Sleeve walls and floors which are cored for installation of conduit with steel tubing grouted into place.
2. Fill space between the conduit and sleeve with waterproof sealant.

H. Where electrical equipment is located in wet locations, on damp or wet walls, or where otherwise indicated on drawings, provide "stand-off" mounting minimum ½ inch from the wall to allow air circulation behind equipment.

I. At project completion, clean all equipment to the original finish.

1. Remove all shipping labels and adhesives.
2. Repair all blemishes to factory applied finishes. Touch-up paint shall match original finish.

J. Make all final tests and inspections prior to energizing equipment.

K. Provide thorough cleaning, tightening and examination of all electrical connections at completion of installation.

L. Inspect all grounding conductors and terminations for completeness of installation.

II. Raceways

A. Minimum conduit size shall be ¾ inch unless otherwise specified or noted on drawings. Switch legs may be installed in ½ inch conduit where in accordance with NEC.

B. Application:

1. RGS:

a. Shall be used for service entrances.
b. Shall be used on all transitions of underground non-metallic conduits to above grade.
c. May be used in concrete or underground.
d. May be used for all raceways except where other type is specified to be used or is required by codes.

2. RGS or IMC:

a. Shall be used for all conduits located below 8 feet AFF in fish rearing spaces.
b. Shall be used for all buried conduits located under buildings or other structures.

3. EMT: May be used anywhere permitted by NEC, except where these specifications require other type shall be used.
4. PVC:

a. May be used for buried distribution outside of buildings or other structures where permitted by codes and shown on the Drawings.

1) PVC conduit for power or control wiring shall not be routed exposed; elbows and conduits to above grade shall be RGS.
2) PVC to RGS transition shall be made with pre-manufactured fittings.
3) Transition from PVC to RGS shall be made at least 12 inches below grade.

b. Ground wire shall be run in all non-metallic conduits.

5. FLEX:

a. May be used where permitted by code when other conduit type is not practical.
b. Shall be used for final connection to portable or vibrating equipment where LT FLEX type is not required.

6. LT FLEX:

a. Shall be used for final connection of all transformers and motors.
b. Shall be used for flexible connections in fish rearing spaces and other wet locations.
c. Shall be used where otherwise called for on the drawings or required by NEC.

C. Joints, bends, and terminations:

1. Joints shall be cut square, reamed smooth, and drawn tight.
2. Bends or offsets shall be made with standard conduit ells, field bends made with a bender or hickey, or hub-type conduit fittings.

a. Number of bends per run shall conform to NEC limitations.
b. Bends shall conform to NEC radius requirements and shall not have kinks or flat spots.

3. RGS:

a. Threaded unless rigid compression fittings are used.
b. Running threads will not be permitted.
c. Conduit ends shall have bushings installed.

4. PVC:

a. Joints shall be made up according to manufacturer's recommendations.
b. Bending of PVC conduits shall be allowed under the following conditions:

1) Conduits shall be bent by heating conduit until pliable.

2) Heating of conduits shall be accomplished by use of heating equipment specifically designed for use on non-metallic conduits. Use of open flames to heat conduits prohibited.
3) Bends shall not impact internal diameter of conduits.

D. Concealed conduits shall be run in a direct line with long sweep bends and offsets.

E. Exposed conduits shall be run parallel to and at right angles to building lines.

F. Raceways shall be run continuous between all outlets, boxes, and other enclosures:

1. Ends shall be secured to all boxes and enclosures with locknuts and bushings as required by NEC.
2. Raceways shall be secured in such a manner that entire system shall be electrically continuous throughout.
3. Conduits1¼ inch trade size and larger shall utilize insulated bushings
4. Sealing locknuts shall be used on boxes and cabinets which are other than NEMA 1 construction.

G. Conduit ends shall be capped to prevent entrance of foreign materials during construction.

H. Raceway installation shall be complete before conductors are pulled in.

I. Raceway support:

1. Securely fasten raceways in place and support from ceiling or walls at spacing not exceeding the maximums listed in the NEC.
2. Provide support within 2 feet of every box, coupling, and each side of offsets or bends.
3. Horizontal and vertical conduit runs shall be supported by one-hole heavy duty malleable iron straps, clamp backs, or other listed devices. Straps shall be used only on walls, ceilings, and columns.
4. Support vertical runs or conduits at each floor level and at interval not to exceed 10 ft.
5. Support devices shall be secured to structure with suitable bolts, expansion shields (where needed), beam-clamps, or special brackets as appropriate for the type of construction.
6. The use of perforated straps or tie wire for supporting or strapping conduits will not be permitted.
7. The size, type, and required strength of the supporting equipment and anchors shall be based on the combined weight of conduit, hangers and cables.

J. Underground conduit installation:

1. Ground shall be excavated in open trenches with width, depth and direction necessary for the proper installation of the underground work.
2. Multiple runs in the same trench shall conform to the following:

a. Provided with manufactured spacers installed at a maximum spacing of eight feet.

b. Joints shall be staggered one foot apart minimum.
c. Minimum spacing between conduits shall be one inch.

3. Conduits outside of buildings or other structures shall be installed a minimum of 30 inches below finished grade unless otherwise noted on drawings.
4. Maintain all trenches and excavations free of standing water during installation.
5. Conduit not encased in concrete shall be bedded firmly per detail on drawing. Provide a minimum of 6 inches of covering on all sides of conduit.
6. Backfill material shall be clean dirt from excavation free of rocks, concrete, brick, or other debris.
7. Raceway installation shall be approved by Architect/Engineer prior to backfilling.
8. Provide barricades, signs, lights, etc. around excavations while open.
9. Provide warning tape at 12 inch depth. See Electrical Identification Special Provision.

III. Wire And Cable

A. Conductors shall be run continuous from outlet to outlet.

1. Splices shall be made only in outlet or junction boxes.
2. Feeder cables shall be continuous from origin to load terminations without intermediate splices unless specifically indicated on the Drawings or approved in writing by Engineer.

B. Do not exceed conduit fill established by the NEC for number of conductors installed in a raceway.

C. Do not pull any cable or wire in a raceway until conduit system is complete and internal raceway has been cleaned.

1. Strain on cables shall not exceed manufacturer's recommendations during pulling.
2. Use pulling lubricant recommended by cable manufacturer for large conductor pulls.

D. Provide permanent pressure-sensitive labels with suitable numbering or lettering on all wiring.

1. Identify each cable or conductor in panelboards, pull and junction boxes, and wiring troughs with circuit number.
2. Identify control wires at each end and in junction boxes with designated wire numbers corresponding to control schematic drawings.

E. Install cabling in a neat, workmanlike manner:

1. Provide sufficient slack for wires and cables inside equipment or panels to allow termination without stretched, angular connections.
2. Wiring in panelboards shall be run parallel or perpendicular to enclosure sides.
3. Neatly arrange wiring, bundle, and fan out to terminations.
4. Maintain minimum conductor bending radius in accord with NEC.

F. Support all conductors in vertical raceways in accord with NEC.

G. All wire in outlet boxes shall extend a minimum of 6 inches from front of the outlet box, or face of wall if recessed box, for installation of devices or fixtures.

H. Roll up all wires in outlet boxes not for connection to fixture or device at that outlet, connect together and tape.

I. Upon completion of cable and wire installation, but before termination to equipment, test each wire for grounds and short circuits. Replace or correct defective wiring.

IV. Boxes

A. The location of all boxes shall be coordinated prior to rough-in.

B. Recessed boxes shall be used in all finished spaces unless otherwise noted on the drawings.

1. Face of box or extension ring shall be flush with wall finish.
2. Box shall be installed plumb.
3. All unused openings shall be closed with approved knock-out closures.
4. Boxes in masonry walls shall be masonry type or 4-inch square box with proper mud/tile ring.

C. Surface mount boxes shall be supported independent of conduit system. Use of conduits as sole support of boxes is not acceptable.

D. All boxes shall be accessible.

1. Locate boxes in mechanical spaces such that box can be accessed after installation of all mechanical systems.
2. Provide access panels as required for boxes located above hard ceilings or behind walls.

E. Boxes shall be suitable for installed location and shall comply with NEC requirements.

F. Thru wall boxes shall not be permitted.

G. Covers for surface mounted boxes shall be of the same material as the box.

H. Install handholes per detail on drawings.

V. Support And Hangers

A. Do not weld conduits or pipe straps to steel structures unless specifically indicated.

B. Apply fasteners to pre-engineered metal building structure per metal building manufacturer's requirements. Where attachments to pre-engineered metal building components detailed on drawings are in conflict with metal building manufacturer's requirements contact Engineer for resolution.

C. The load applied to fasteners or hangers shall not exceed one-third the proof test load of the fasteners or hangers.

D. For fasteners attached to concrete, use vibration and shock resistant type.

E. In partitions of light steel construction, use sheet metal screws.

F. In suspended-ceiling construction, spring steel fasteners to ceiling system supports may be used for the support of conduits serving light fixtures or other ceiling-mounted devices. No other conduits may be supported from the ceiling suspension system.

G. Where two or more conduits run parallel, trapeze hangers may be used:

1. Trapeze shall be provided at intervals not exceeding the NEC spacing for the smallest conduit or raceway supported by the trapeze.
2. Trapeze hangers shall be constructed from threaded solid rods. Connections to cross members shall be with locking washers and nuts.
3. Cross members shall be either galvanized "L" angle, channel iron, or support strut.
4. Individually fasten conduits to the cross member of every trapeze hanger with one hole straps or clamp backs with proper size bolts, washers and nuts.
5. When adjustable trapeze hangers are used, use U-bolt type clamps at each end of conduit runs, on both sides of elbows or other bends, and at each third intermediate hanger.
6. All trapeze components shall be constructed of either non-corroding materials or provided with a non-corrosive finish. All fasteners shall be stainless steel.

H. All hangers shall be constructed of durable materials suitable for the installed location.

I. Provide screws, bolts, washers and all miscellaneous hardware of materials suitable for the installed environment.

VI. Concrete Housekeeping Pads

A. Concrete housekeeping pads shall be provided under all floor mounted electrical equipment and where shown otherwise on the Drawings.

B. Concrete pads shall be 4" high with 3/4" chamfered edges.

C. Pads shall be 4" larger on all sides than the piece of equipment served.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. GATE STRUCTURE – ELECTRICAL WORK as shown on the Electrical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

3. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

4. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. GATE STRUCTURE – ELECTRICAL WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

3. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

4. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION BASIC ELECTRICAL MATERIALS AND METHODS

BASIC MECHANICAL MATERIALS & METHODS

GENERAL

I. Provision Includes

A. Plumbing work as outlined on drawings and specified herein.

B. Mechanical work as outlined on drawings and specified here-in.

C. Plumbing and Mechanical Demolition.

II. Quality Assurance

A. All plumbing work shall comply with the current Illinois Plumbing Code.

B. All materials and equipment furnished shall be new and to the extent possible, standard products of the various manufacturers except where special construction or performance features are called for. Where more than one of any specific item is required, all shall be of the same type and manufacturer.

C. The product of specified acceptable manufacturers shall be acceptable only when that product complies with or is modified as necessary to comply with all specified and indicated requirements (listed herein or on the Drawings).

D. Materials and equipment not herein specified or indicated as to manufacturer but necessary for complete functioning systems, shall be provided from sources conforming to the quality levels and functional requirements for corresponding materials and equipment set forth herein.

III. Regulatory Agencies, Codes, And Standards

A. Governing state, local governmental laws, ordinances, referenced codes and standards constitute minimum requirements and strict compliance shall be part of the Contract Documents.

B. The Contractor shall include in the Work, without extra cost to the Department, any labor, materials, services, apparatus, drawings, in order to comply with all applicable laws, ordinances, rules and regulations, whether or not shown on the drawings and/or specified.

C. Portions or all of certain recognized industry or association standards referred to herein as being a requirement of these Specifications shall be considered as binding as though reproduced in full herein. Unless otherwise stated the referenced standard shall be the standard which is current as of the date of issuance of these Specifications. Reference may be made to standards either by full name or for the sake of brevity by letter designation as follows:

1. AABC Associated Air Balance Council
2. AGA American Gas Association
3. AMCA Air Moving and Conditioning Association

4. ANSI American National Standards Institute
5. ASHRAE American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.
6. AWWA American Water Works Association
7. FM Factory Mutual Engineering Corporation
8. IPC Illinois Plumbing Code
9. NEC National Electric Code
10. NEMA National Electric Manufacturers Association
11. NFPA National Fire Protection Association
12. OSHA Occupational Safety and Health Administration
13. SMACNA Sheet Metal and Air Conditioning Contractors National Association, Inc.
14. UL Underwriters' Laboratories, Inc.

IV. Product Delivery, Storage, And Handling

A. Materials and equipment shall not be delivered to the work site until their installation, according to the work schedule, is imminent. These materials and equipment shall be stored only in areas designated as Contractor's storage areas.

B. Materials and equipment subject to deterioration shall be stored and protected accordingly.

C. Contractor shall be responsible for all damage to materials stored on site.

V. Project Conditions

A. When existing conditions prohibit the proper installation as shown on the Drawings or as specified herein, the Contractor shall notify the Engineer, in writing, requesting solution.

B. Contractor is responsible for the verification of new and existing conditions on the site before that particular phase of installation begins.

C. Installation of systems specified shall be coordinated with all other work specified in the Contract Documents.

D. All expenses incurred by Engineer in troubleshooting systems and problems caused by inadequate workmanship or unauthorized or authorized deviations from the Contract Documents including materials or equipment substitutions on the part of a Contractor shall be borne by that Contractor.

VI. Warranty & Inspections

A. The Contractor shall submit in writing a guarantee warranting all items of material, equipment and labor furnished to be free of defects for a minimum period of one (1) year from the date of final acceptance of the work by the Department, and further agrees that if defects appear within stipulated guarantee period, same shall be replaced or made good without charge.

B. Where inspections of the work are required by State of Local authorities, obtain certificates of inspection of the work by such authorities and submit to the Engineer.

VII. Cutting And Patching

A. All cutting and patching shall be done in order that this work may be properly installed.

B. All disturbed constructions or finishes shall be replaced or repaired to their original condition.

C. Under no condition shall structural work be cut except upon approval of the Engineer.

D. Cutting through ceilings, floors, walls and partitions shall be done in a careful manner and the openings filled around the pipes, conduits, and sleeves.

VIII. Location Of Equipment

A. The approximate location of all equipment is shown on the Drawings.

B. The Engineer reserves the right to change the location of any equipment five (5) feet in any direction without these changes being made the subject of an extra charge provided such changes are made before final installation.

IX. Lines And Levels

A. Determine all grades, maintain necessary lines and levels throughout the progress of the work, and assume full responsibility for their correctness. Where levels are indicated on the Drawings, work shall be installed at those levels unless prior written approval to change is obtained from the Engineer.

MATERIAL REQUIREMENTS

I. MATERIALS

A. Each item of equipment furnished under these specifications is to be essentially the standard product of the manufacturer, however, component parts of equipment need not be products of one manufacturer.

B. All material and equipment shall be of the best quality normally used in good commercial practice, being products of reputable manufacturers.

C. Each major component shall bear a nameplate stating name and address of the manufacturer and catalog number or designation.

D. All materials shall be of the manufacturer's latest design standard, and bear Underwriter's Laboratories, Inc. label and the manufacturer's trademark.

CONSTRUCTION REQUIREMENTS

I. DEMOLITION

A. Remove and dispose of portions of existing buildings, structures, or other equipment as noted on the drawings.

B. Department reserves the right to salvage any materials identified to be removed.

C. Conduct demolition to minimize interference with adjacent structures or portions of structures that are not to be disturbed.

D. Provide and maintain temporary barriers and security during demolition process.

E. Conduct operations to minimize interference to Department's operations.

F. Maintain egress and access to facilities at all times.

G. Provide protection to existing structures or portions of structures to remain to prevent damage.

1. Cease operations and notify Engineer immediately when adjacent structures or portions of structures are damaged or appear endangered.
2. Do not proceed further with demolition activities in the affected area until corrective measures have been implemented.

H. All piping and utilities are to be removed in entirety unless specifically noted otherwise; this includes piping and utilities buried underground.

I. Backfill areas excavated to perform demolition activities.

J. Immediately remove demolished materials from site. Provide dumpster or other approved means of hauling demolished materials from site.

K. Do not burn or dispose of materials on site.

L. Cease operations and notify Engineer immediately should hazardous materials be encountered or suspected.

1. Do not proceed further with demolition activities in the affected are until suspect materials have been properly tested and deemed not to be a hazardous material requiring special removal and disposal requirements.
2. Provide the services of a specialized hazardous materials removal and disposal contractor should suspect materials be declared hazardous.

II. INSTALLATION

A. Listed or Labeled Equipment: Listed or labeled equipment shall be installed in accordance with instructions included in the listing or labeling.

B. Anchors: All equipment shall be firmly attached to the structure using anchors, screws, hangers, etc. listed for the use intended.

III. MOVING OF MATERIAL

A. If necessary, the Contractor shall be responsible for moving temporarily located materials in order to complete final installation.

IV. PROTECTION OF WORK

A. The Contractor shall protect his work from injury by keeping all equipment and materials protected.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. BOILER DEMOLITION as shown on the Mechanical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

2. DAM CONTROLS PROCESS AIR SYSTEM MODIFICATIONS as shown on the Plumbing Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

3. GATE STRUCTURE – MECHANICAL WORK (HVAC) as shown on the Mechanical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

4. GATE STRUCTURE – PLUMBING WORK as shown on the Plumbing Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

5. LOCK GATE MACHINERY as shown on the Mechanical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

6. LOCK PLUMBING WORK as shown on the Plumbing Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. BOILER DEMOLITION shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. DAM CONTROLS PROCESS AIR SYSTEM MODIFICATIONS shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

3. GATE STRUCTURE – MECHANICAL WORK (HVAC) shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

4. GATE STRUCTURE – PLUMBING WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

5. LOCK GATE MACHINERY shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

6. LOCK PLUMBING WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION BASIC MECHANICAL MATERIALS & METHODS

BRICK RESTORATION AND CLEANING

GENERAL

A. Section includes work on existing brick masonry at the Lockhouse, consisting of brick masonry reuse, restoration and cleaning as follows:

1. Repairing unit masonry, including replacing units.

2. Repointing joints.

3. Preliminary cleaning, including removing plant growth on exterior.

4. Cleaning exposed unit masonry surfaces on exterior.

I. DEFINITIONS

A. Low-Pressure Spray: 100 to 400 psi (690 to 2750 kPa); 4 to 6 gpm (0.25 to 0.4 L/s)

B. Medium-Pressure Spray: 400 to 800 psi (2750 to 5510 kPa); 4 to 6 gpm (0.25 to 0.4 L/s)

II. PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on masonry units as follows.

1. Existing Brick: Test each type of existing masonry unit indicated for replacement, according to testing methods in ASTM C 67 for compressive strength, 24-hour cold-water absorption, 5-hour boil absorption, saturation coefficient, and initial rate of absorption (suction). Carefully remove five existing units from locations designated by Engineer. Take testing samples from these units.
2. Existing Mortar: Test according to ASTM C 295, modified as agreed by testing service and Engineer for Project requirements, to determine proportional composition of original ingredients, sizes and colors of aggregates, and approximate strength. Use X-ray diffraction, infrared spectroscopy, and differential thermal analysis as necessary to supplement microscopical methods. Carefully remove existing mortar from within joints at five locations designated by testing service.
3. Replacement Brick: Test each proposed type of replacement masonry unit, according to sampling and testing methods in ASTM C 67 for compressive strength, 24-hour cold-water absorption, 5-hour boil absorption, saturation coefficient, and initial rate of absorption (suction).

III. QUALITY ASSURANCE

A. Restoration Specialist Qualifications: Engage an experienced, preapproved masonry restoration and cleaning firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience installing standard unit masonry is not sufficient experience for masonry restoration work.

1. At Contractor's option, work may be divided between two specialist firms: one for cleaning work and one for repair work.
2. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisors on Project site during times that clay masonry restoration and cleaning work is in progress.
3. Restoration Worker Qualifications: Persons who are experienced in restoration work of types they will be performing. When masonry units are being patched, assign at least one worker among those performing patching work who is trained and certified by manufacturer of patching compound to apply its products.

B. Mockups: Prepare mockups of restoration and cleaning to demonstrate aesthetic effects and set quality standards for materials and execution and for fabrication and installation.

1. Masonry Repair: Prepare sample areas for each type of masonry material indicated to have repair work performed. If not otherwise indicated, size each mockup not smaller than 2 adjacent whole units or approximately 48 inches (1200 mm) in least dimension. Erect sample areas in existing walls unless otherwise indicated, to demonstrate quality of materials, workmanship, and blending with existing work. Include the following as a minimum:

a. Replacement:

1) Four brick units replaced.

b. Patching: Three small holes at least 1 inch (25 mm) in diameter for each type of masonry material indicated to be patched, so as to leave no evidence of repair.

2. Repointing: Rake out joints in 2 separate areas , each approximately 24 inches high by 24 inches wide for each type of repointing required and repoint one of the areas.
3. Cleaning: Clean an area approximately 25 sq. ft. (2.3 sq. m) for each type of masonry and surface condition.

C. Preinstallation Conference: Conduct conference at Project site.

MATERIAL REQUIREMENTS

I. MASONRY MATERIALS

A. Face Brick: Provide face brick, including specially molded, ground, cut, or sawed shapes where required to complete masonry restoration work.

1. Provide units with physical properties, colors, color variation within units, surface texture, size, and shape to match existing brickwork.

a. For existing brickwork that exhibits a range of colors or color variation within units, provide brick that proportionally matches that range and variation rather than brick that matches an individual color within that range.

2. Special Shapes:

a. Provide specially molded, 100 percent solid shapes for applications where core holes or "frogs" could be exposed to view or weather when in final position and where shapes produced by sawing would result in sawed surfaces being exposed to view.
b. Mechanical chopping or breaking brick, or bonding pieces of brick together by adhesive, are not acceptable procedures for fabricating special shapes.

B. Building Brick: Provide building brick complying with ASTM C 62, Grade SW where in contact with earth, Grade SW, MW, or NW for concealed backup; and of same vertical dimension as face brick, for masonry work concealed from view.

II. MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type II, white or gray or both where required for color matching of exposed mortar.

1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.

C. Mortar Sand: ASTM C 144 unless otherwise indicated.

1. Color: Provide natural sand or ground marble, granite, or other sound stone of color necessary to produce mortar color that matches the existing mortar.
2. For pointing mortar, provide sand with rounded edges.
3. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.

D. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.

E. Water: Potable.

III. MANUFACTURED REPAIR MATERIALS

A. Masonry Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching masonry.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cathedral Stone Products, Inc.; Jahn M100 Terra Cotta and Brick Repair Mortar.
b. Conproco Corporation; Mimic
c. Edison Coatings, Inc.; Custom System 45.

2. Use formulation that is vapor- and water permeable (equal to or more than the masonry unit), exhibits low shrinkage, has lower modulus of elasticity than the masonry units being repaired, and develops high bond strength to all types of masonry.
3. Formulate patching compound used for patching brick in colors and textures to match each masonry unit being patched.

IV. CLEANING MATERIALS

A. Water: Potable.

B. Hot Water: Water heated to a temperature of 140 to 160 deg F (60 to 71 deg C).

C. Job-Mixed Detergent Solution: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium polyphosphate, 1/2 cup (125 mL) of laundry detergent, and 20 quarts (20 L) of hot water for every 5 gal. (20 L) of solution required.

D. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium polyphosphate, 5 quarts (5 L) of 5 percent sodium hypochlorite (bleach), and 15 quarts (15 L) of hot water for every 5 gal. (20 L) of solution required.

V. ACCESSORY MATERIALS

A. Setting Buttons: Resilient plastic buttons, nonstaining to masonry, sized to suit joint thicknesses and bed depths of masonry units without intruding into required depths of pointing materials.

VI. MORTAR MIXES

A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.

B. Do not use admixtures in mortar unless otherwise indicated.

C. Mortar Proportions: Mix mortar materials in the following proportions:

1. Pointing Mortar for Brick: 1 part portland cement, 1 part lime, and 6 parts.

a. Add mortar pigments to produce mortar colors required.

2. Rebuilding (Setting) Mortar: Comply with ASTM C 270, Proportion Specification, Type N unless otherwise indicated; with cementitious material limited to portland cement and lime.

CONSTRUCTION REQUIREMENTS

I. PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.

B. Comply with chemical-cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical-cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. When no longer needed, promptly remove masking to prevent adhesive staining.
2. Keep wall wet below area being cleaned to prevent streaking from runoff.
3. Maintain area to prevent cleaning solutions and cleaning water run-off from entering the adjacent waterway.

II. BRICK REMOVAL AND REPLACEMENT

A. At locations indicated, remove bricks that are damaged, spalled, or deteriorated or are to be reused. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.

B. Support and protect remaining masonry that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

C. Notify Engineer of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

D. Remove in an undamaged condition as many whole bricks as possible.

1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.

E. Clean bricks surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.

F. Replace removed damaged brick with other removed brick in good quality, where possible, or with new brick matching existing brick, including size. Do not use broken units unless they can be cut to usable size.

G. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

1. Maintain joint width for replacement units to match existing joints.
2. Use setting buttons or shims to set units accurately spaced with uniform joints.

H. Lay replacement brick with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. (30 g/194 sq. cm per min.). Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.

1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
2. Rake out mortar used for laying brick before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing masonry, and at same time as repointing of surrounding area.
3. When mortar is sufficiently hard to support units, remove shims and other devices interfering with pointing of joints.

III. MASONRY UNIT PATCHING

A. Patching Bricks:

1. Remove loose material from masonry surface. Carefully remove additional material so patch will not have feathered edges but will have square or slightly undercut edges on area to be patched and will be at least 1/4 inch (6 mm) thick, but not less than recommended by patching compound manufacturer.
2. Mask adjacent mortar joint or rake out for repointing if patch will extend to edge of masonry unit.
3. Mix patching compound in individual batches to match each unit being patched.
4. Rinse surface to be patched and leave damp, but without standing water.
5. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
6. Place patching compound in layers as recommended by patching compound manufacturer, but not less than 1/4 inch (6 mm) or more than 2 inches (50 mm) thick. Roughen surface of each layer to provide a key for next layer.
7. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of the masonry unit. Shape and finish surface before or after curing, as determined by testing, to best match existing masonry unit.
8. Keep each layer damp for 72 hours or until patching compound has set.

IV. CLEANING MASONRY, GENERAL

A. Proceed with cleaning in an orderly manner; work from bottom to top of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water will not wash over cleaned, dry surfaces.

B. Use only those cleaning methods indicated for each masonry material and location.

1. Do not use wire brushes or brushes that are not resistant to chemical cleaner being used. Do not use plastic-bristle brushes if natural-fiber brushes will resist chemical cleaner being used.
2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage masonry.

a. Equip units with pressure gages.

3. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray tip.
4. For water-spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
5. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F (60 and 71 deg C) at flow rates indicated.

C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.

D. Water-Spray Application Method: Unless otherwise indicated, hold spray nozzle at least 18 inches from surface of masonry and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

E. Chemical-Cleaner Application Methods: Apply chemical cleaners to masonry surfaces to comply with chemical-cleaner manufacturer's written instructions; use brush or spray application. Do not spray apply at pressures exceeding 50 psi (345 kPa). Do not allow chemicals to remain on surface for periods longer than those indicated or recommended by manufacturer.

F. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.

1. Apply neutralizing agent and repeat rinse if necessary to produce tested pH of between 6.7 and 7.5.

V. PRELIMINARY CLEANING

A. Removing Plant Growth: Completely remove visible plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing to dry as long as possible before removal. Remove loose soil and debris from open masonry joints to whatever depth they occur.

B. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to cleaning methods being used. Extraneous substances include paint, calking, asphalt, and tar.

1. Carefully remove heavy accumulations of material from surface of masonry with a sharp chisel. Do not scratch or chip masonry surface.
2. Remove paint and calking with alkaline paint remover.

    a. Repeat application up to two times if needed.

3. Remove asphalt and tar with solvent-type paint remover.

    a. Comply with requirements in "Paint Removal" Article.
    b. Apply paint remover only to asphalt and tar by brush without prewetting.
    c. Allow paint remover to remain on surface for 10 to 30 minutes.
    d. Repeat application if needed.

VI. CLEANING MASONRY

A. Detergent Cleaning:

1. Wet masonry with cold water applied by low-pressure spray.
2. Scrub masonry with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that masonry surface remains wet.
3. Rinse with cold water applied by low-pressure spray to remove detergent solution and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

B. Mold, Mildew, and Algae Removal:

1. Wet masonry with cold water applied by low-pressure spray.
2. Apply mold, mildew, and algae remover by brush or low-pressure spray.
3. Scrub masonry with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that masonry surface remains wet.
4. Rinse with cold water applied by low-pressure spray to remove mold, mildew, and algae remover and soil.

5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

VII. REPOINTING MASONRY

A. Rake out and repoint joints to the following extent:

1. All joints in areas indicated.
2. Joints where mortar is missing or where they contain holes.
3. Cracked joints where cracks can be penetrated at least 1/4 inch (6 mm) by a knife blade 0.027 inch (0.7 mm) thick.
4. Cracked joints where cracks are 1/16 inch or more in width and of any depth.
5. Joints where they sound hollow when tapped by metal object.
6. Joints where they are worn back 1/4 inch (6 mm) or more from surface.
7. Joints where they are deteriorated to point that mortar can be easily removed by hand, without tools.
8. Joints where they have been filled with substances other than mortar.
9. Joints indicated as sealant-filled joints.

B. Do not rake out and repoint joints where not required.

C. Rake out joints as follows, according to procedures demonstrated in approved mockup:

1. Remove mortar from joints to depth of joint width plus 1/8 inch (3 mm) but not less than 1/2 inch (13 mm) or not less than that required to expose sound, unweathered mortar.
2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
3. Do not spall edges of masonry units or widen joints.

    a. Cut out mortar by hand with chisel and resilient mallet. Do not use power-operated grinders.
    b. Cut out center of mortar bed joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar by hand with chisel and resilient mallet.

D. Notify Engineer of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.

E. Pointing with Mortar:

1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch (9 mm) until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
3. After low areas have been filled to same depth as remaining joints, point all joints by placing mortar in layers not greater than 3/8 inch (9 mm). Fully

compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry units have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed masonry surfaces or to featheredge the mortar.

4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
5. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours including weekends and holidays.

    a. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.

6. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

F. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

VIII. FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure.

1. Do not use metal scrapers or brushes.
2. Do not use acidic or alkaline cleaners.

BASIS OF PAYMENT

All labor, equipment, supports, hardware, and tools to complete the brick restoration and cleaning where indicated in the construction documents will be paid for at the lump sum price for LOCKHOUSE – BRICK RESTORATION & CLEANING.

END OF SPECIAL PROVISION – BRICK RESTORATION & CLEANING

BUILDING INSULATION GENERAL

I. This section relates to all work associated with polyurethane spray foam interior insulation.

II. ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

III. INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Research/evaluation reports.

MATERIAL REQUIREMENTS

I. SPRAY POLYURETHANE FOAM INSULATION

A. Closed-Cell Polyurethane Foam Insulation: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 25 and 450, @ 4" thickness respectively, per ASTM E 84.

B. Basis of Design: NCFI, Insulstar, High Performance Insulation

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. BASF Corporation.
b. Gaco Western Inc.
c. NCFI; Division of Barnhardt Mfg. Co.

C. Closed-Cell Polyurethane Foam Insulation Properties:

1. Closed Cell Content: Greater than 90%
2. Density: 2.0 lb./cubic ft. nominal.
3. Comprehensive Strength: 25 psi nominal
4. Vapor Retarder: Class II @ 1.3"
5. R-Value Aged ASTM C 518: R-6.8 @ 1" thickness.
6. Anti-Bacterial: Yes
7. Air Permanence: 0.000 scfm/sqft. @ scfm/ sqft. @ 1.57 psf (ASTM E 283)
8. Tensile strength: Greater than 50 psi (ASTM D 1623)
9. Hydrostatic Pressure Resistance: No Failure @ 54 cm or 26 in Head Pressure (AATCC 127)
10. Water Resistive Barrier: Pass (ASTM E 331)

CONSTRUCTION REQUIREMENTS

I. INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. 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.

D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

II. 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 for interior applications: 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.

C. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

LOCKHOUSE – INTERIOR SPRAY FOAM INSULATION shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

LOCKHOUSE - INTERIOR SPRAY FOAM INSULATION shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to install insulation and other items incidental to the insulation as shown on the plans.

END OF SPECIAL PROVISION – BUILDING INSULATION

CERAMIC TILE

GENERAL

I. Section Includes:

A. Ceramic tile.
B. Waterproof membrane.
C. Crack isolation membrane.

II. ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

III. MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering and identified with labels describing contents.

Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated

MATERIAL REQUIREMENTS

I. TILE PRODUCTS

A. ANSI Ceramic Tile Standard: Provide Standard grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

B. Tile Type 2x2 Ceramic Mosiac: Factory-mounted unglazed ceramic mosaic tile.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Olean; Division of Dal-Tile International Inc.
b. Daltile; Division of Dal-Tile International Inc.
c. Interceramic.
d. Grupo Porcelanite.
e. Seneca Tiles, Inc.

2. Composition: Porcelain.
3. Module Size: 2 by 2 inches (50.8 by 50.8 mm.
4. Thickness: 1/4 inch (6.35 mm).
5. Face: Plain with cushion edges.
6. Surface: Slip-resistant, with abrasive admixture.
7. Tile Color and Pattern: As selected by Department from manufacturer's full range.
8. Grout Color: As selected by Department from manufacturer's full range.

9. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:

C. Tile Type: 4x4 Glazed Sanitary Tile Base.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following :

a. American Olean; Division of Dal-Tile International Inc.
b. Daltile; Division of Dal-Tile International Inc.
c. Interceramic.
d. Grupo Porcelanite.
e. Seneca Tiles, Inc.

2. Face Size: 4 by 4 inches (102 by 102 mm.
3. Thickness: 3/8 inch (9.5 mm)
4. Finish: Bright, opaque glaze.
5. Tile Color and Pattern: As selected by Department from manufacturer's full range.
6. Grout Color: As selected by Department from manufacturer's full range.
7. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:

II. THRESHOLDS

A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.

1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch (1.5 mm) above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch (12.7 mm) or less above adjacent floor surface.

B. Marble Thresholds: ASTM C 503, with a minimum abrasion resistance of 10 per ASTM C 1353 or ASTM C 241 and with honed finish.

1. Description: Uniform, fine- to medium-grained white stone with gray veining.

III. WATERPROOF MEMBRANE

A. General: Manufacturer's standard product, that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated.

1. Products: Subject to compliance with requirements, provide the following or approved equivalent:

a. Noble Company (The); NobleSeal TS.

IV. CRACK ISOLATION MEMBRANE

A. General: Manufacturer's standard product that complies with ANSI A118.12 for high performance and is recommended by the manufacturer for the application indicated.

1. Products: Subject to compliance with requirements, provide the following or approved equivalent product:

a. Noble Company (The); NobleSeal CIS.

V. SETTING MATERIALS

A. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Bonsal American; an Oldcastle company.
b. Bostik, Inc.
c. Custom Building Products.
d. Jamo Inc.
e. Laticrete International, Inc.
f. MAPEI Corporation.
g. Mer-Kote Products, Inc.

2. Prepackaged, dry-mortar mix combined with liquid-latex additive.
3. For wall applications, provide nonsagging mortar.

VI. GROUT MATERIALS

A. Polymer-Modified Tile Grout: ANSI A118.7.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Bonsal American; an Oldcastle company.
b. Bostik, Inc.
c. Custom Building Products.
d. Jamo Inc.
e. Laticrete International, Inc.
f. MAPEI Corporation.

VII. ELASTOMERIC SEALANTS

A. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. DAP Inc.; 100 percent Silicone Kitchen and Bath Sealant.
    b. Dow Corning Corporation; Dow Corning 786.
    c. GE Silicones, a division of GE Specialty Materials; Sanitary 1700.
    d. Laticrete International, Inc.; Latasil Tile & Stone Sealant.
    e. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
    f. Tremco Incorporated; Tremsil 600 White.

VIII. MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. Bonsal American, an Oldcastle company; Grout Sealer.
    b. Bostik, Inc.; CeramaSeal Grout & Tile Sealer.
    c. C-Cure; Penetrating Sealer 978.
    d. Custom Building Products; Grout & Tile Sealer.
    e. Jamo Inc.; Matte Finish Sealer.
    f. MAPEI Corporation; KER 004, Keraseal Penetrating Sealer for Unglazed Grout and Tile.
    g. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
    h. TEC, a subsidiary of H. B. Fuller Company; TA-256 Penetrating Silicone] [TA-257 Silicone Grout Sealer.

CONSTRUCTION REQUIREMENTS

I. EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

II. PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A.

C. Blending: For tile exhibiting color variations, use factory blended tile or blend tiles at Project site before installing.

D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

III. INSTALLATION

A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

1. For the following installations, follow procedures in the ANSI A108 Series of tile installation standards for providing 95 percent mortar coverage:

a. Tile floors in wet areas.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

1. Ceramic Mosaic Tile: 1/16 inch (1.6 mm).
2. Glazed Wall Tile: 1/16 inch (1.6 mm).

G. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
2. Prepare joints and apply sealants to comply with requirements in Section 07920 "Joint Sealants."

H. Marble Thresholds: Install marble thresholds in same type of setting bed as adjacent floor.

I. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

J. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.

K. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.

BASIS OF PAYMENT

Payment for ceramic tile will be made at the lump sum price for LOCKHOUSE - FLOORING.

END OF SPECIAL PROVISION – CERAMIC TILE

CIRCUIT AND MOTOR DISCONNECTS

GENERAL

I. Provision Includes

A. Fusible and non-fusible safety switches.

B. Enclosed circuit breakers.

C. Manual motor starters.

II. References

A. National Electrical Manufacturers Association (NEMA):

1. KS-1 – Switches.
2. AB-1 – Circuit Breakers.
3. 250 – Enclosures for Electrical Equipment.

B. National Fire Protection Association (NFPA):

1. NFPA 70 - National Electrical Code (NEC).

C. Underwriters Laboratories, Inc. (UL):

1. All materials UL listed and labeled.

D. State of Illinois:

1. Illinois Steel Products Procurement Act, as amended.

III. Submittals

A. Product Data: Submit manufacturer's product data for disconnects and enclosed circuit breakers.

MATERIAL REQUIREMENTS

I. Fractional Horsepower Manual Starter

A. Quick make and break toggle action operator with trip-free mechanism.

B. Double break silver alloy contacts.

C. Inoperative unless one-piece, interchangeable, melting alloy thermal unit is in position.

D. Shall include red pilot light.

E. Enclosures:

1. Manual starters installed in finished spaces shall be provided open for installation in recessed outlet box.
2. Provide manufacturer's standard NEMA 1 enclosure for indoor installations in dry, unfinished spaces.
3. Provide manufacturer's standard NEMA 4X enclosures for interior wet location and all outdoor installations.

II. Fusible And Non-Fusible Safety Switches

A. UL listed and labeled.

B. Heavy duty, 600 Volt rated only. General duty switches not acceptable.

C. Horsepower rated for AC or DC as specified.

D. Switchblades shall be visible in the OFF position when the door is open.

E. Lugs shall be UL listed for use with either aluminum or copper cables. Lugs shall be front removable for replacement.

F. Current carrying parts shall be plated.

G. Operating mechanism:

1. Quick-make and quick-break design.
2. Operating handle shall be an integral part of the box, not the cover.
3. Handle shall be provided with an interlock to prevent unauthorized opening of the switch door in the ON position or closing of the switch mechanism with the door open.
4. Handle position shall clearly indicate if disconnect is ON or OFF.
5. Handle shall be lockable in the OFF position.

H. Enclosures:

1. Provide NEMA 1 enclosures for dry locations, Stainless Steel NEMA 4X for indoor wet locations and all outdoor locations.

    a. NEMA 1 enclosures shall be constructed of UL 98 code gauge sheet steel
    b. NEMA 1 enclosures shall be treated with a rust-inhibiting phosphate primer and baked enamel finish.

I. Where shown on drawings, provide auxiliary contact in disconnect that opens when disconnect is opened.

J. Fusible disconnects: In addition to the above, fusible disconnects shall meet the following:

1. Shall be provided with Class R fuse clips.

2. UL listed short circuit ratings with Class R fuses shall be 200,000 amperes RMS symmetrical.

III. Enclosed Circuit Breakers:

A. UL listed and labeled.

B. NEMA AB-1.

C. Circuit breakers shall be molded case type.

1. Quick-make, quick-break, overcenter, trip-free, toggle-type operating mechanism with positive handle indication that assumes a center position when unit trips.
2. Permanent trip unit containing individual thermal and magnetic trip elements calibrated for operation in an ambient temperature of 40 degrees C.
3. Suitable for mounting in any position.
4. Minimum UL listed interrupting ratings as follows:

a. 250V maximum:

1)	Up to 100A Frame	10,000 AIC.
2)	225A Frame	25,000 AIC.
3)	400A Frame	42,000 AIC.
4)	Over 400A Frame	50,000 AIC.

b. 600V maximum:

1)	Up to 100A Frame	14,000 AIC.
2)	225A Frame	22,000 AIC.
3)	Over 225A Frame	30,000 AIC.

D. Enclosures:

1. Furnished in NEMA 1 enclosures for indoor dry locations.

a. NEMA 1 enclosures shall be constructed of UL 98 code gauge sheet steel.
b. Enclosures shall be treated with a rust-inhibiting phosphate primer and powder-coat baked enamel finish.

2. Provided with stainless steel NEMA 4X enclosures for:

a. Indoor wet locations.
b. Outdoor locations.
c. Where specifically called for on drawings.

IV. Acceptable Manufacturers:

A. Allen Bradley

B. Cutler Hammer

C. General Electric

D. Siemens

E. Square D

CONSTRUCTION REQUIREMENTS

I. Installation

A. Rigidly secured to mounting surface. Conduit shall not be used for the support means.

B. Installed plumb and level with their tops no more than six (6) ft. above the floor.

C. Where separate control voltages are used for control circuits within motor controllers, the disconnect device shall simultaneously disconnect the control circuits in addition to the power circuits.

D. Provide LT FLEX conduit to all motors and transformers, FLEX conduit to all other loads unless noted otherwise on the drawings or required by NEC.

II. Field Quality Control

A. Prior to acceptance of work by Using Agency, interlocks, doors and handles of disconnects shall be operated and adjusted if necessary to assure proper operation.

B. Nuts, bolts and screws shall be tightened to manufacturer's specifications.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – ELECTRICAL WORK as shown on the Electrical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

3. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – ELECTRICAL WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

3. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION - CIRCUIT AND MOTOR DISCONNECTS

COFFERDAMS
Revised: September 17, 2013

REPLACE ARTICLE 502.06 WITH THE FOLLOWING:

A. **502.06 Cofferdams.** The work shall include design and construction of cofferdam(s) as required for temporary excavation, groundwater control, dewatering, and construction of structures without in any way jeopardizing or compromising the integrity or safety of the existing lock, gate structure, hinged-crest gate, fixed crest dam, dam, and other project features, or new project structures. Such structures may include:

1. Location 1 - Proposed Intake Structure
2. Location 2 - Proposed Lock Repair - Upstream
3. Location 3 - Proposed Lock Extension - Downstream
4. Location 4 - Proposed Gate Structure – Phase 1
5. Location 5 - Proposed Gate Structure – Phase 2

B. 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 location, height, and size limitations as shown on the contract plans and as specified below. Cofferdams may consist of, but are not limited to: concrete gravity structures; earth-rock cofferdams; sheet pile cellular cofferdams; or sheet pile walls. 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.

C. The Contractor shall submit a cofferdam work 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 work plan shall address the following:

I. Cofferdam Work Plan

A. The Contractor shall submit a cofferdam work plan which describes the cofferdam system; safety requirements; addresses the proposed methods of construction and removal; construction sequencing, schedule and phasing; instrumentation and monitoring; temporary excavation and ground support; groundwater and surface water control; dewatering and re-watering methods; erosion and sediment control measures; disposal of excavated material; effluent water control measures; backfilling; the best management practices to prevent reintroduction of excavated material into the aquatic environment; and other relevant data needed to assess the completeness of the cofferdam work plan. 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.

B. The cofferdam work plan shall describe the methods for temporary excavation, including temporary slopes, and any shoring and sheeting of excavations. Drawings shall include, temporary slopes, shoring and sheeting material sizes and types, arrangement of members including any anchorage, location of shoring and sheeting and excavation of soils, and

the sequence and method of installation and removal. Calculations shall include slope stability, structural design, data and references used. The plan shall address at a minimum the following temporary excavations:

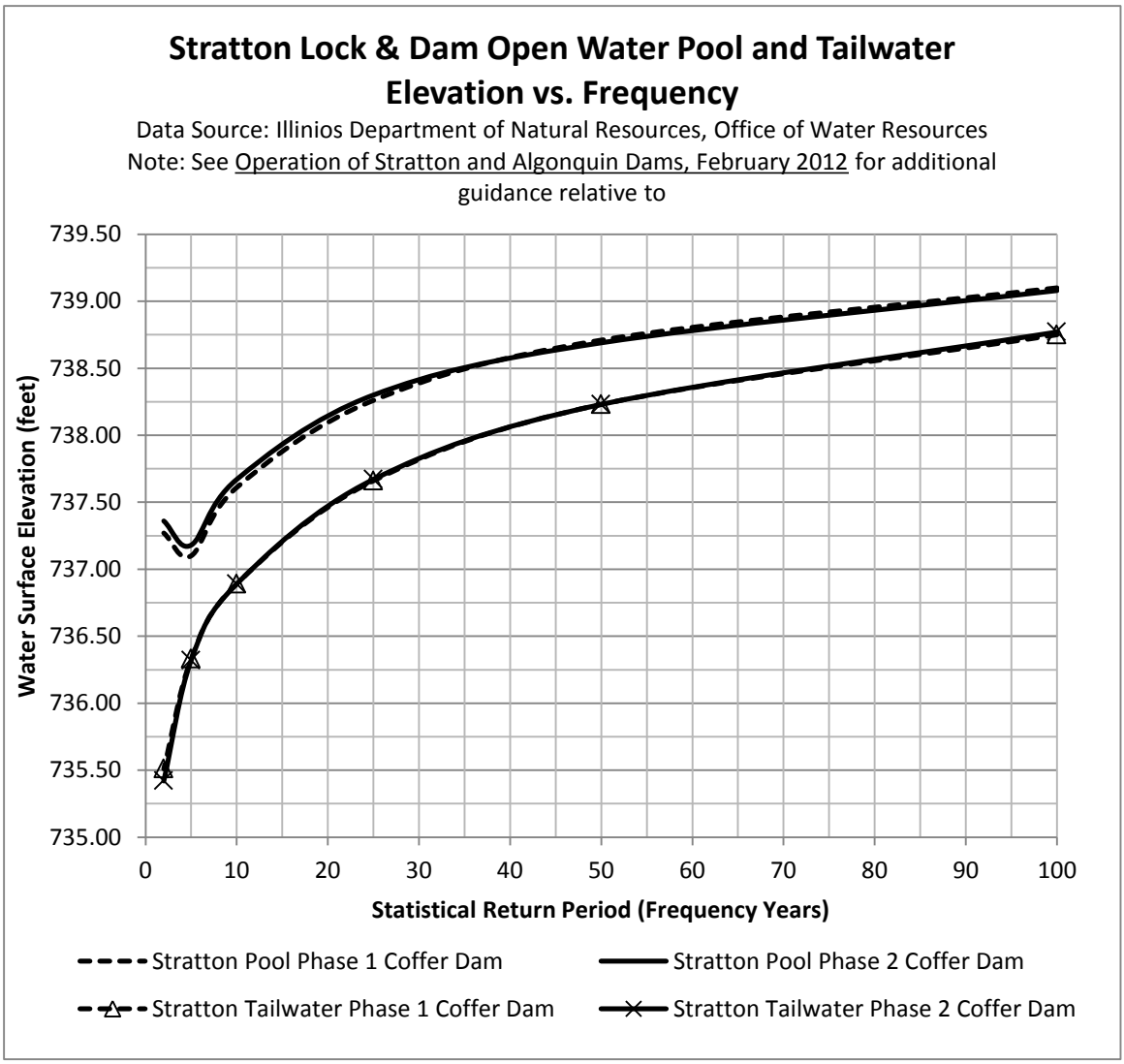
1. Location 1 - Proposed Intake Structure: Existing island stability
2. Location 2 - Proposed Lock Repair – Upstream: Existing tieback and anchor wall system stability (east and west)
3. Location 3 - Proposed Lock Extension – Downstream: Existing tieback and anchor wall system stability (east and west); Existing lower approach wall and bulkhead stability (west); Existing island stability
4. Location 4 - Proposed Gate Structure – Phase 1: Existing island stability
5. Location 5 - Proposed Gate Structure – Phase 2: Existing island stability

C. The cofferdam work plan shall describe the methods for accomplishing groundwater control and dewatering work. The plan shall include the estimated flows, number, type, and location of dewatering wells to be provided, number of primary and backup pumps to be provided, outlet line sizes, and planned outlet discharge locations. Calculations shall include seepage, well design, data and references used.

D. The concept, arrangement and design of the cofferdams is the responsibility of the Contractor. The Contractor shall demonstrate to the Engineer that the Contractor's cofferdam design will provide a safe and effective means of excavating for the construction of the project structures, constructing those structures and components, placing construction materials and placing the project structures into operation without compromising the safety and integrity of the existing lock, gate structure, hinged-crest gate, fixed crest dam, dam, and other project features, or new project structures, in any way.

II. Design Criteria

A. Cofferdam Design Water Surface Elevation (CDWE): Cofferdams shall be designed based on a water surface elevation of 739.25 feet. See the following figure (Stratton Lock & Dam Open Water Pool and Tailwater Elevation vs. Frequency) for relative stages during open channel flows. See the Illinois Department of Natural Resources publication "Operation of the Stratton & Algonquin Dams, February 2012" for additional guidance relative to winter flows and the potential for ice jams.



B. Cofferdam Design Elevation: Cofferdams shall be designed and constructed based on the location, height, and size limitations as shown on the contract plans and as specified herein. Cofferdams for the Proposed Gate Structure – Phase 1 (Location 4) and Phase 2 (Location 5) shall be designed and constructed with a top elevation of 739.25.

C. Site Data: Refer to the geotechnical data included with the contract documents. Contractor shall be responsible to assess the completeness of the information provided and to procure and develop additional data considered necessary for the design and safe construction of the cofferdams.

III. Documentation

A. Arrangement Drawings: Submit detailed arrangement drawings indicating dimensions and construction details. Drawings must show the relationship with other existing and new structures, and include phases of the construction; control of water; end-of-construction and emergency re-watering; maintenance and removal.

B. Construction Drawings: Submit detailed construction drawings indicating all details of construction, including excavation, fill, and compaction; structural and miscellaneous steel fabrication and erection details; sheet piling; sealing; instrumentation; and other details required for fabrication, installation, construction, and removal of the cofferdam and related components.

C. Design Calculations: Submit design calculations. Include all components for design, including design criteria, assumptions, stability analyses, structural analyses, connection design, seepage analyses, reference data and other relevant design information.

D. Design Calculations and Drawings shall be signed and sealed by an Illinois Licensed Structural Engineer and Illinois Licensed Professional Engineering having a minimum 10 years' experience in the design, construction, and monitoring of similar cofferdams.

E. Unless noted otherwise on the Plans, 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 LAST PARAGRAPH OF 502.12(B) TO READ AS FOLLOWS:

A. Cofferdams, when specified, will be measured for payment per each, one per contract for:

1. Cofferdam - Location 1
2. Cofferdam - Location 2
3. Cofferdam - Location 3
4. Cofferdam - Location 4
5. Cofferdam - Location 5

B. Completed cofferdams, when specified, having been overtopped by a water surface having an elevation greater than 739.25 feet, prior to breaching, and requiring repair, unwatering and restoration of cofferdam, will be measured for payment per each per occurrence for:

1. Cofferdam Restoration - Location 1
2. Cofferdam Restoration - Location 2
3. Cofferdam Restoration - Location 3
4. Cofferdam Restoration - Location 4
5. Cofferdam Restoration - Location 5

C. Completed cofferdams, having breached at a water surface elevation below 739.25 feet, shall not be measured for payment. Cofferdams not specified herein shall not be measured for payment.

REVISE THE FIRST SENTENCE OF THE SIXTH PARAGRAPH OF 502.13 TO READ AS FOLLOWS:

A. Cofferdams, when specified, will be paid for at the contract unit price per each for:

1. Cofferdam - Location 1
2. Cofferdam - Location 2

3. Cofferdam - Location 3
4. Cofferdam - Location 4
5. Cofferdam - Location 5

B. Completed cofferdams, when specified, having been overtopped by a water surface having an elevation greater than 739.25 feet, prior to breaching, and requiring repair, unwatering and restoration of cofferdam, will be paid for at the contract unit price per each per occurrence for:

1. Cofferdam Restoration - Location 1
2. Cofferdam Restoration - Location 2
3. Cofferdam Restoration - Location 3
4. Cofferdam Restoration - Location 4
5. Cofferdam Restoration - Location 5

C. Completed cofferdams, having breached at a water surface elevation below 739.25 feet, shall not be paid for. Cofferdams not specified herein shall not be paid for.

COMPRESSED AIR PIPING & VALVES

GENERAL

I. Provision Includes:

A. Galvanized Steel Pipe for Compressed Air for Pneumatic Systems and for Non-Buried Low Pressure Air

B. Valves for Compressed Air

II. Submittals:

A. Valves and their actuators and limit switches:

1. Manufacturer Product Data
2. Installation, Operation & Maintenance Manuals

B. Pipe Specialties:

1. Manufacturers Product Data

MATERIAL REQUIREMENTS

I. Galvanized Steel Pipe

A. Pipe, fittings, valves, and accessories:

1. Piping: ASTM A-312, Schedule 40, galvanized steel.
2. Fittings: Threaded.
3. Hangers: Stainless Steel or Galvanized Steel.
4. General: All materials shall conform to ASTM A-240.

II. Valves

A. Ball Valves used in steel pneumatic piping system, 2" and under.

1. Manual ball valves shall be 2-piece full port, not less than 600 psig (WOG), bronze body, 316 stainless steel ball and stem, RPTFE seats, lever handle, threaded ends and actuator mounting pad with two 24-volt limit switches.
2. Manufacturers and models:

a. Apollo 77-140 plus Dwyer or Stonel switches coordinated by Apollo

B. Motorized ball valves shall be 2-piece, full port, not less than 600 psig (WOG), bronze body, stainless steel ball and stem, PTFE seal, on/off 120-volt actuator, actuator mounting pad, spring closed, two SPDT switches to signal on and off positions, manual override, 2-year warranty, equal to Belimo B225VS+AFBUP-S-X1.

CONSTRUCTION REQUIREMENTS

I. Piping

A. Systems shall be installed as shown on the Drawings, and in a neat and workmanlike manner using only new materials. Lines shall be installed parallel with or at right angles to walls unless otherwise shown on Drawings.

B. Materials and equipment shall be thoroughly cleaned and inspected, prior to installation. No cracked, broken or defective piece shall be used in the work.

C. The interior surfaces of all piping and equipment shall be cleaned and free of all dirt, loose scale, rust, and other foreign material before installation.

D. Pipe ends shall be reamed to remove all burrs, and pipe sections shall be cleaned inside to remove all chips and foreign material prior to making up joints. Pipe lines shall be installed with as few joints as possible and short lengths of pipe coupled together shall not be used. Pipe shall not extend into the waterway of the pipe fitting.

E. Prior to joining the pipe, the ends of the pipe to be jointed and the jointing material shall be clean and dry. The interior of the pipe shall be cleaned of all foreign materials as the work progresses. At the end of the work day, temporarily plug and block all open ends of pipe.

F. Unless otherwise noted, bending of pipe shall not be permitted, only ells shall be utilized for a change in direction. Pipe joints shall not be deflected in an amount greater than recommended by the manufacturer.

II. Piping Connections

A. Threaded Connections

1. Threaded joints shall be in accordance with ANSI B2.1. Threaded joints shall be made up Teflon tape of lead free pipe joint compound applied to the make thread only. Should a joint be loosened after being made up, it shall not be made up a second time unless the threads are cleaned and new compound applied.

III. Exposed Pipe

A. All exposed piping, valves, and fittings shall be securely fastened to the structure with hangers, supports, guides, anchors or sway braces to maintain pipe alignment, prevent sagging and straining due to uncontrolled movement. All supports shall support the weight of the pipe, fittings, valves and contents without exceeding the maximum recommended load for the pipe support.

B. Pipe supports shall be installed with anchorage adequate to develop the maximum recommended load of the pipe support. Contractor shall provide additional supports which may be determined as necessary by the Department for the proper suspension, bracing , or support for the pipe.

IV. Valves Installation

A. Valves shall be installed at all points indicated on the Drawings. Where Drawings do not specifically indicate a valve size, valves shall be same diameter as the pipe it serves.

B. All valves shall be installed with stems vertical wherever possible and shall not be installed with stems below horizontal under any condition.

C. All valves shall operate freely without binding or sticking in any position from fully open to fully closed. Any valves that do not operate freely shall be adjusted to the satisfaction of the Engineer or replaced.

V. Cleaning And Testing Of Compressed Air Piping

A. After assembly but prior to connecting to bladders, pneumatic piping shall be flushed with water to remove dirt and debris.

B. After water flush, blow dry with dry nitrogen. Be certain piping is dry prior to connecting to other system components.

C. After all pneumatic piping is complete and flushed; the system shall be tested for leaks. Pressurize the system with air or nitrogen to 50 PSI. Inspect for leaks by applying soapy water to all fittings and connections. Any leaks shall be repaired.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROLS PROCESS AIR SYSTEM MODIFICATIONS as shown on the Plumbing Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK PLUMBING WORK as shown on the Plumbing Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROLS PROCESS AIR SYSTEM MODIFICATIONS shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK PLUMBING WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION - COMPRESSED AIR PIPING & VALVES

CONSTRUCTION LAYOUT STAKES

DESCRIPTION

A. The Contractor shall furnish and place construction layout stakes for this project. The Department will provide adequate reference points to the centerline of survey and bench marks as shown in the plans and listed herein. Any additional control points set by the Department will be identified in the field to the Contractor and all field notes will be kept in the office of the Resident Engineer.

B. The Contractor shall provide field forces, equipment, and material to set all additional stakes for this project, which are needed to establish offset stakes, reference points, and any other horizontal or vertical controls, including supplementary bench marks, necessary to secure a correct layout of the work. Stakes for line and grade of pavement and/or curb shall be set at sufficient station intervals (not to exceed 50 ft) to assure substantial conformance to plan line and grade. The Contractor will not be required to set additional stakes to locate a utility line which is not included as a pay item in the contract nor to determine property lines between private properties.

C. The Contractor shall be responsible for having the finished work conform to the lines, grades, elevations, and dimensions called for in the plans. Any inspection or checking of the Contractor's layout by the Department Engineer and the acceptance of all or any part of it shall not relieve the Contractor of his/her responsibility to secure the proper dimensions, grades and elevations of the several parts of the work. The Contractor shall exercise care in the preservation of stakes and bench marks and shall have them reset when any are damaged, lost, displaced, removed, or otherwise obliterated.

RESPONSIBILITY OF THE DEPARTMENT

A. The Department will make random checks of the Contractor's staking to determine if the work is in conformance with the plans. Where the Contractor's work will tie into work that is being or will be done by others, checks will be made to determine if the work is in conformance with the proposed overall grade and horizontal alignment.

B. The Department will make all measurements and take all cross sections from which the various pay items will be measured.

C. Where the Contractor, in setting construction stakes, discovers discrepancies, the Department will check to determine their nature and make whatever revisions are necessary in the plans, including the recross sectioning of the area involved. Any additional restaking required by the Engineer will be the responsibility of the Contractor. The additional restaking done by the Contractor will be paid for according to Article 109.04 of the Standard Specifications.

D. The Department will accept responsibility for the accuracy of the initial control points as provided herein.

E. It is not the responsibility of the Department, except as provided herein, to check the correctness of the Contractor's stakes; any errors apparent will be immediately called to the Contractor's attention and s(he) shall make the necessary correction before the stakes are used for construction purposes.

F. Where the plan quantities for excavation are to be used as the final pay quantities, the Department will make sufficient checks to determine if the work has been completed in conformance with the plan cross sections.

RESPONSIBILITY OF THE CONTRACTOR

A. The Contractor shall establish from the given survey points and bench marks all the control points necessary to construct the individual project elements. S(he) shall provide the Engineer adequate control in close proximity to each individual element to allow adequate checking of construction operations. This includes, but is not limited to, line and grade stakes, line and grade nails in form work, and/or filed or etched marks in substantially completed construction work. It is the Contractor's responsibility to tie in centerline control points in order to preserve them during construction operations.

B. At the completion of the grading operations, the Contractor shall set stakes at 100 ft Station intervals along each profile grade line. These stakes will be used for final cross sectioning by the Department.

C. All work shall be according to normally accepted self-checking surveying practices. Field notes shall be kept in standard survey field notebooks and those books shall become the property of the Department at the completion of the project. All notes shall be neat, orderly and in accepted form.

D. For structure staking, the Contractor shall use diligent care and appropriate accuracy. Points shall be positioned to allow reuse throughout the construction process. Prior to the beginning of construction activities, all structure centerlines and baselines are to be established by the Contractor and checked by the Engineer. The Contractor shall provide a detailed structure layout drawing showing span dimensions, staking lines and offset distances.

MEASUREMENT AND PAYMENT

This work will be paid for at the contract lump sum price for CONSTRUCTION LAYOUT.

END OF SPECIAL PROVISION – CONSTRUCTION LAYOUT STAKES

CONTACTORS

GENERAL

I. Provision Includes general purpose & lighting contactors.

II. References:

A. National Electrical Manufacturers Association (NEMA):

1. NEMA ICS-6 – Enclosures for Industrial Controls and Systems.
2. NEMA ICS-2 - Industrial Control Devices, Controllers, and Assemblies.
3. NEMA 250 – Enclosures.

B. National Fire Protection Association (NFPA):

1. NFPA-70, National Electric Code (NEC).
2. NFPA-101, Life Safety Code.

C. Underwriters Laboratories (UL):

1. All components UL listed or labeled.

D. State of Illinois:

1. Illinois Steel Products Procurement Act, as amended.

III. Submittals

A. Shop Drawings:

1. Submit complete wiring diagrams for all systems.

a. Diagrams to show all components of system, all wiring, and actual connections to all components.
b. Identify all wiring as to type, purpose and operating voltage.
c. Label all terminals on components.

2. Submit drawings for all cabinets and enclosures. Drawings to shown how equipment is to be arranged, internal or other conduit entry points, and internal components.

B. Product Data:

1. Submit manufacturers data for all system components. Data to include model numbers, ratings, operating conditions, and descriptions of all accessories and options to be provided.
2. Submit data on dimming ballasts, indicating number and type of lamps ballast is designed to operate.

C. Operating and Maintenance Manuals:

1. Submit manufacturers operating instructions for all components and systems. Instructions shall include information on making adjustments to programs or sensitivities.
2. Submit maintenance manual for each system. Each maintenance manual shall include descriptions for each component, manufacturers recommended maintenance procedures, troubleshooting guide, and complete parts list. Provide copy of actual system wiring diagram as installed in building (Record Documents) in each manual.
3. Submit data on adjustment and replacement of coils and contacts for all contactors.

MATERIAL REQUIREMENTS

I. Acceptable Manufacturers

A. ASCO

B. Allen Bradley

C. General Electric

D. Square D

II. General Purpose Contactors

A. UL - 50 approved, NEMA ICS-2 construction.

B. Industrial duty rated, capable of operating on circuits up to 600V.

C. Contacts continuously rated for loads connected as shown on Drawings. Capable of making and breaking full load current with the use of auxiliary arcing contacts.

D. Totally enclosed, magnetically operated, electrically held contacts, double break design.

1. Power contact points constructed of silver-cadmium-oxide.
2. Contact inspection and replacement possible without disconnecting line or load wiring.

E. Straight through wiring, with all terminals clearly marked.

F. Operating coils shall be continuous duty rated, voltage as noted on Drawings.

G. Provided open for mounting in panelboard or other enclosure.

H. Provisions for factory or field installation of up to Four N.O. or N.C., 600V continuous rated power poles.

I. Provided with one (1) set of field-convertible auxiliary contacts.

J. Current ratings as noted on Drawings.

III. Lighting Contactors

A. UL - 50 approved, NEMA ICS-2 construction.

B. Industrial duty rated, capable of operating on circuits up to 600V.

C. Contacts continuously rated for loads connected as shown on Drawings. Capable of making and breaking full load current with the use of auxiliary arcing contacts.

D. Totally enclosed, magnetically operated, electrically held contacts, double break design.

1. Power contact points constructed of silver-cadmium-oxide.
2. Contact inspection and replacement possible without disconnecting line or load wiring.

E. Straight through wiring, with all terminals clearly marked.

F. Operating coils shall be intermediate duty rated, voltage as noted on Drawings.

1. Designed for three wire momentary-contact control circuit.
2. Provided with coil clearing contacts for coil protection.

G. Provided in NEMA 1 enclosure.

H. Provisions for factory or field installation of:

1. Up to Four N.O. or N.C., 600V, 6A continuous rated power poles.
2. Transient surge module for up to 120V control circuit.

I. Current ratings as noted on Drawings.

IV. Accessories

A. Pushbuttons and Selector Switches: NEMA ICS-2, general duty type.

B. Indicating Lights: NEMA ICS-2, push-to-test LED type.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Install all components according to manufacturer's installation instructions.

B. Route all wiring within cabinets in neat, workmanlike manner. Group wires together in wire channels and secure using plastic wire straps.

C. Securely attach all cabinets, boxes, etc., to building structure.

D. Identification:

1. Wire identification shall correspond to submitted wiring diagrams for the system.

2. Provide engraved plastic nameplates for all contactors, time clocks, control cabinets and switches describing equipment and area served by component.
3. See Electrical Identification special provision.

II. Field Quality Control

A. Before systems are energized, provide a complete visual inspection of all components to insure proper installation.

B. Adjust contact pressure on all contacts to provide smooth operation without excessive chatter or bounce. Be sure contacts drop completely open when de-energized, without obstructions or other hindrance.

C. Provide complete operational test of all systems. Check operation of contactors and control devices. for proper operation.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.4.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION CONTACTORS

CONTROL AUXILIARIES

GENERAL

I. Summary

A. Section Includes:

1. Loop isolator.
2. Pilot devices.
3. Relays/timer.
4. Termination equipment:

a. Terminal blocks.
b. Fuse holders.

5. Power supplies.

II. Quality Assurance

A. Referenced Standards:

1. National Electrical Manufacturers Association (NEMA):

a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
b. ICS 2, Industrial Control and Systems: Controllers, Contactors, and Overload Relays Rated 600 Volts.

2. Underwriters Laboratories, Inc. (UL).

III. Submittals

A. Shop Drawings.

B. Operation and Maintenance Manuals.

MATERIAL REQUIREMENTS

I. Signal Module

A. Loop Isolators:

1. Acceptable manufacturers:

a. AGM Electronics.
b. Moore Industries.

2. Design and fabrication:

a. Solid state electronics.

b. Transmit analog output signal directly proportional to measured input signal.
c. Power source: 24 Vdc.
d. Analog input: 4-20 mA DC or 1-5 Vdc.
e. Output signal: 4-20 mA DC into 1400 ohms.
f. Impedance:

1) Voltage input: 10 Meg.
2) Current input: 50 ohms.
3) Voltage output: 1 ohm.
4) Current output: 1650 ohms.

g. Accuracy: Better than ± 0.10 percent of span.
h. Isolation: Up to 500 V rms (input, output and case).
i. Temperature effect: ±0.0025 percent of span per DegF.
j. Ambient temperature range: 0-140 DegF.
k. Factory calibrated.

II. Pilot Devices

A. Selector Switches:

1. Acceptable manufacturers:

a. Cutler Hammer.
b. Allen-Bradley.

2. Design and fabrication:

a. Heavy-duty type.
b. NEMA 4X.
c. Rotary cam units conforming to NEMA ICS 2-216.22.
d. Mounting hole: 30.5 mm.
e. Supply switches having number of positions required with contact blocks to fulfill functions shown and specified.
f. UL listed.
g. Maintained contact type.
h. Knob type operators.
i. Black colored operators.
j. Designed with cam and contact block with approximate area of 2 IN SQ.
k. Legend plate marked per Contract Documents.
l. Contact block requirements: Hermetically sealed contact blocks.

B. Pushbuttons:

1. Acceptable manufacturers:

a. Cutler Hammer.
b. Allen-Bradley.

2. Materials:

a. Backing diaphragm: Buna-N.

3. Design and fabrication:

a. Heavy-duty type.
b. NEMA 4X.
c. Conforming to NEMA ICS 2-216.22.
d. Mounting hole: 30.5 mm.
e. Diaphragm backed.
f. UL listed.
g. Emergency stop pushbuttons to have mushroom head operator and maintained contact.
h. Non-illuminated type:

1) Momentary contact with necessary contact blocks.
2) Molded, solid color melamine buttons.
3) Standard flush operators with no shroud.
4) Black colored buttons for START, RAISE, LOWER, or ON and red color for STOP or OFF.
5) Appropriate contact blocks to fulfill functions shown or specified.

i. Contact block requirements:

1) Dry and indoor locations: Standard contact blocks rated for 10 A continuous current.
2) Wet or outside locations: Hermetically sealed contact blocks.
3) Legend plate marked per Contract Documents.

C. Indicating Lights:

1. Acceptable manufacturers:

a. Cutler Hammer.
b. Allen-Bradley.

2. Design and fabrication:

a. Heavy duty.
b. NEMA 4X.
c. Type allowing replacement of bulb without removal from control panel.
d. LED.
e. UL listed.
f. 24 V or 120V lamp as required by control power voltage.
g. Legends marked per Contract Documents.
h. Nominal 2 IN SQ face.
i. Mounting hole: 30.5 mm.
j. Push-to-test indicating lights.
k. Glass lens.
l. Color code lights as indicated on drawings.
m. Legend plate engraved for each light.

III. Relays/Timers

A. Control Relays:

1. Acceptable manufacturers:

a. Idec.
b. Potter & Brumsfield.
c. Allen-Bradley.

2. Design and fabrication:

a. Plug-in general purpose relay.
b. Blade connector type.
c. Switching capacity: 10 A.
d. Contact material: Silver cadmium oxide.
e. Provide relays with a minimum of 3 SPDT contacts.
f. Coil voltage: 120 Vac or 24 Vdc as required by control power voltage.
g. Relay sockets are DIN rail mounted.
h. Internal neon or LED indicator is lit when coil is energized.
i. Clear polycarbonate dust cover with clip fastener.
j. Check button.
k. Temperature rise:

1) Coil: 85 DegF max.
2) Contact: 65 DegF max.

l. Insulation resistance: 100 Meg min.
m. Frequency response: 1800 operations/hour.
n. Operating temperature: -20 to +150 DegF.
o. Life expectancy:

1) Electrical: 500,000 operations or more.
2) Mechanical: 50,000,000 operations or more.

p. UL listed or recognized.

B. Time Delay Relays:

1. Acceptable manufacturers:

a. Eagle Signal Controls.
b. Idec.

2. Design and fabrication:

a. Melt design test and performance requirements of NEMA ICS 2-218.
b. Heavy-duty.
c. Solid-state construction.
d. External adjusting dial.

e. Auxiliary relays as required to perform functions specified or shown on Drawings.
f. Operates on 117 Vac (±10 percent) power source.
g. Contact rating: A150 per NEMA ICS 2-125.
h. Furnish with "on" and "timing out" indicators.

IV. Termination Equipment

A. Terminal Blocks:

1. Acceptable manufacturers:

a. Phoenix Contact.
b. Allen-Bradley.

2. Design and fabrication:

a. Modular type with screw compression clamp.
b. Screws: Stainless steel.
c. Current bar: Nickel-plated copper allow.
d. Thermoplastic insulation rated for -40 to +90 DegC.
e. Wire insertion area: Funnel-shaped to guide all conductor strands into terminal.
f. Install end sections and end stops at each end of terminal strip.
g. Install machine-printed terminal markers on both sides of block.
h. Spacing: 6 mm.
i. Wire size: 22-12 AWG.
j. Rated voltage: 600 V.
k. Din rail mounting.
l. UL listed.

3. Standard-type block:

a. Rated current: 30 A.
b. Color: Gray body.

4. Bladed-type block:

a. Terminal block with knife blade disconnect which connects or isolated the two (2) sides of the block.
b. Rated current: 10 A.
c. Color:

1) Panel control voltage leaves enclosure - normal: Gray body, orange switch.
2) Foreign voltage entering enclosure: Orange body, orange switch.

5. Grounded-type block:

a. Electrically grounded to mounting rail.

b. Use to terminal ground wires and analog cable shields.
c. Color: Green and yellow body.

B. Fuse Holders:

1. Acceptable manufacturers:

a. Phoenix Contact.
b. Allen-Bradley.

2. Design and fabrication:

a. Modular-type with screw compression clamp.
b. Screws: Stainless steel.
c. Current bar: Nickel-plated copper alloy.
d. Thermoplastic insulation rated for -40 to +105 DegC.
e. Wire insertion area: Funnel-shaped to guide all conductor strands into terminal.
f. Blocks can be ganged for multi-pole operation.
g. Install end sections and end stops at each end of terminal strip.
h. Install machine-printed terminal markers on both sides of block.
i. Spacing: 9.1 mm.
j. Wire size: 30-12 AWG.
k. Rated voltage: 300 V.
l. Rated current: 12 A.
m. Fuse size: 1/4 x 1-1/4.
n. Blown fuse indication.
o. DIN rail mounting.
p. UL listed.

V. Power Supplies

A. DC Power Supplies:

1. Acceptable manufacturers:

a. Sola Hevi-Duty.
b. Phoenix Contact.
c. Rockwell Automation.

2. Design and fabrication:

a. Converts 120 Vac input to DC power at required voltage.
b. DIN rail mount with enclosure (i.e., not open frame).
c. Switching type.
d. AC input: 120 Vac +/-15 percent, nominal 60 Hz.
e. Efficiency: Minimum 86 percent.
f. Rated mean time between failure (MTBF): 500,000 HRS.
g. Voltage regulation:

1) Static: Less than 1.0 percent V_{out}.

2) Dynamic: +/-2 percent V_{out} overall.

h. Output ripple/noise: Less than 100 mV peak to peak (20 MHz).
i. Overload, short circuit and open circuit protection.
j. Temperature rating: 0 to 60 DegC full rated, derated linearly to 50 percent at 70 DegC.
k. Humidity rating: Up to 90 percent, non-condensing.
l. LED status indication for DC power.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Install products in accordance with manufacturer's instructions.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION – CONTROL AUXILIARIES

CONTROL LOOP DESCRIPTIONS

GENERAL

I. Provision Includes: Instrumentation control loop descriptions.

II. System Description

A. The control loop descriptions provide the functional requirements of the control loops represented in the Contract Documents.

1. Descriptions are provided as follows:

a. Control system overview and general description.
b. Major equipment to be controlled.
c. Major field mounted instruments (does not include local gages).
d. Manual control functions.
e. Automatic control functions/interlocks.
f. Major indications provided at local control panels and motor starters/VFD's.
g. Remote indications and alarms.

B. The control loop descriptions are not intended to be an inclusive listing of all elements and appurtenances required to execute loop functions, but are rather intended to supplement and complement the Drawings and other Specification Sections.

1. The control loop descriptions shall not be considered equal to a bill of materials.

C. Provide instrumentation hardware and software as necessary to perform control functions specified herein and shown on Drawings.

III. Submittals

A. Operation and Maintenance Manuals.

B. Control Strategy for Record Documents:

1. Obtain control loop descriptions in electronic format from Engineer at beginning of Project.
2. Revise and update the file monthly during construction and start-up to reflect all changes that occur due to specific equipment and systems supplied on the Project.

a. Show all revisions in 'track change' mode.
b. Change Title to read "Control Loop Descriptions - Contractor Record Document."
c. Reference all changes by Request for Information (RFI) number or Change Proposal Request (CPR) number.
d. Submit revised file monthly to Engineer for review.

3. Deliver the revised and updated file as a final control loop description Record Document in the Operation and Maintenance Manual.
4. Provide both paper copy and electronic copy (on CD-ROM) of the Record Document control loop descriptions in the Operation and Maintenance Manual.

MATERIAL REQUIREMENTS - (NOT APPLICABLE TO THIS SPECIAL PROVISION)

CONSTRUCTION REQUIREMENTS

I. Lock Control System Operating Sequence:

A. Lock control system shall offer three basic modes of lock operation:

1. Manual control of each individual lock, fill, and empty gate.
2. Manual control of each lock gate pair, all fill gates, and all empty gates.
3. Automated lock controls based upon the automatic lock sequenced described below.

B. Manual Controls:

1. Controls shall be provided to operate:

a. Each individual lock miter gate operator VFD.
b. Each individual lock fill sluice gate operator VFD.
c. Each individual lock empty sluice gate operator VFD.

2. Controls shall also be provided to operate the following combination of loads together as if a single unit:

a. Upstream Lock Gates (VFD-LG-UE and VFD-LG-UW).
b. All Fill Gates (VFD-FG-UE, VFD-FG-UW, and VFD-FG-C).
c. All Empty Gates (VFD-EG-CE, VFD-EG-CW, VFD-EG-DE, and VFD-EG-DW).
d. Downstream Lock Gates (VFD-LG-DE and VFD-LG-DW).

3. The following manual controls shall be provided for each individual and group of loads:

a. Manual Open
b. Manual Close
c. Stop

4. Initiation of Manual Open shall cause the associated VFD or group of VFD's to operate in forward. VFD(s) shall continue to operate in forward until:

a. Stop control is pressed.
b. Manual Close control is pressed.
c. Full Open limit switch is made.

5. Initiation of Manual Close shall cause the associated VFD or group of VFD's to operate in reverse. VFD(s) shall continue to operate in reverse until:

a. Stop control is pressed.
b. Manual Open control is pressed.
c. Full Closed limit switch is made.

6. Pressing Stop shall cause the associated load or group of loads to stop operation in either direction.

7. Pressing Manual Open while load or group of loads is closing, or pressing Manual Close while load or group of loads is opening, shall cause the load or group of loads to stop and reverse direction. Load(s) shall continue to operate in the opposite direction until Manual Stop is pressed or limit switch(es) are made.

C. Automatic Sequence 1 – Lockage from Upstream to Downstream:

1. Initial Conditions:

a. Downstream Lock Gates closed.
b. Upstream Lock Gates open.
c. Emptying Gates all closed.
d. Fill Gates all open.
e. Lock Approach Signal – Upstream: Red.
f. Lock Exit Signal – Upstream: Red.
g. Lock Approach Signal – Downstream: Red.
h. Lock Exit Signal – Downstream: Red

2. Operator allows boats to enter lock:

a. Operator changes Lock Approach Signal – Upstream from Red to Green.
b. Operator changes Lock Approach Signal – Upstream from Green to Red when sufficient boats have entered lock.

3. When all boats secure in lock, Operator shall initiate lockage sequence. When lockage sequence initiated, system shall:

a. Close all Fill Gates by starting VFD-FG-UE, VFD-FG-UW, and VFD-FG-C in reverse.

1) Stop VFD-FG-UE when LM-FG-UE-CL makes.
2) Stop VFD-FG-UW when LM-FG-UW-CL makes.
3) Stop VFD-FG-C when LM-FG-C-CL makes.

b. Close Upstream Lock Gates by starting VFD-LG-UE and VFD-LG-UW in reverse.

1) Stop VFD-LG-UE when LM-LG-UE-CL makes.
2) Stop VFD-LG-UW when LM-LG-UW-CL makes.

c. Open all Emptying Gates by starting VFD-EG-CE, VFD-EG-CW, VFD-EG-DE, and VFD-EG-DW in forward after both Upstream Lock Gates full closed (LM-LG-UW-CL and LM-LG-UE-CL both made).

1) Stop VFD-EG-CE when LM-EG-CE-O makes.
2) Stop VFD-EG-CW when LM-EG-CW-O makes.
3) Stop VFD-EG-DE when LM-EG-DE-O makes.
4) Stop VFD-EG-DW when LM-EG-DW-O makes.

d. Open Downstream Lock Gates by starting VFD-LG-DE and VFD-LG-DW in forward when Lock Water Level equals Downstream Pool Water Level (LT-LOCK = LT-LOCK-D),

1) Stop VFD-LG-DE when LM-LG-DE-O makes.
2) Stop VFD-LG-DW when LM-LG-DW-O makes.

e. Allow boats to exit lock by changing Lock Exit Signal – Downstream from Red to Green after Downstream Lock Gates full open (LM-LG-DE-O and LM-LG-DW-O both made).

4. When all boats have exited lock, Operator shall ready lock for Upstream Passage by changing Lock Exit Signal – Downstream from Green to Red.

D. Automatic Sequence 2 – Lockage from Downstream to Upstream:

1. Initial Conditions:

a. Upstream Lock Gates closed.
b. Downstream Lock Gates open.
c. Emptying Gates all open.
d. Fill Gates all closed.
e. Lock Approach Signal – Upstream: Red.
f. Lock Exit Signal – Upstream: Red.
g. Lock Approach Signal – Downstream: Red.
h. Lock Exit Signal – Downstream: Red

2. Operator allows boats to enter lock:

a. Operator changes Lock Approach Signal – Downstream from Red to Green.
b. Operator changes Lock Approach Signal – Downstream from Green to Red when sufficient boats have entered lock.

3. When all boats secure in lock, Operator shall initiate lockage sequence. When lockage sequence initiated, system shall:

a. Close all Emptying Gates by starting VFD-EG-DE, VFD-EG-DW, VFD-EG-CE, and VFD-EG-CW in reverse.

1) Stop VFD-EG-DE when LM-EG-DE-CL makes.
2) Stop VFD-EG-DW when LM-EG-DW-CL makes.
3) Stop VFD-EG-CE when LM-EG-CE-CL makes.
4) Stop VFD-EG-CW when LM-EG-CW-CL makes.

b. Close Downstream Lock Gates by starting VFD-LG-DE and VFD-LG-DW in reverse.

1) Stop VFD-LG-DE when LM-LG-DE-CL makes.
2) Stop VFD-LG-DW when LM-LG-DW-CL makes.

c. Open all Fill Gates by starting VFD-FG-UE, VFD-FG-UW, and VFD-FG-C in forward after both Downstream Lock Gates full closed (LM-LG-DW-CL and LM-LG-DE-CL both made).

1) Stop VFD-FG-UE when LM-FG-UE-O makes.
2) Stop VFD-FG-UW when LM-FG-UW-O makes.
3) Stop VFD-FG-C when LM-FG-C-O makes.

d. Open Upstream Lock Gates by starting VFD-LG-UE and VFD-LG-UW in forward when Lock Water Level equals Upstream Pool Water Level (LT-LOCK = LT-LOCK-U).

1) Stop VFD-LG-UE when LM-LG-UE-O makes.
2) Stop VFD-LG-UW when LM-LG-UW-O makes.

e. Allow boats to exit lock by changing Lock Exit Signal – Upstream from Red to Green after Upstream Lock Gates full open (LM-LG-UE-O and LM-LG-UW-O both made).

4. When all boats have exited lock, Operator shall ready lock for Downstream Passage by changing Lock Exit Signal – Upstream from Green to Red.

E. Automatic Sequence 3 – Lock Safe Mode.

1. When Operator initiates Lock Safe Sequence:

a. System shall determine if lock is in Upstream Ready or Downstream Ready position by checking Initial Conditions.
b. System shall automatically initiate proper Lock Ready Sequence depending on lock Initial Conditions.

2. Lock Safe Operating Sequence – Upstream Ready:

a. Initial Conditions for Upstream Ready position:

1) Downstream Lock Gates closed.
2) Upstream Lock Gates open.
3) Emptying Gates all closed.
4) Fill Gates all open.

b. To place lock into Lock Safe Mode when Upstream ready, system shall:

1) Close Upstream Lock Gates by starting VFD-LG-UE and VFD-LG-UW in reverse.

a) Stop VFD-LG-UE when LM-LG-UE-CL makes.

b) Stop VFD-LG-UW when LM-LG-UW-CL makes.

2) Open all Emptying Gates by starting VFD-EG-CE, VFD-EG-CW, VFD-EG-DE, and VFD-EG-DW in forward after both Upstream Lock Gates full closed (LM-LG-UW-CL and LM-LG-UE-CL both made).

a) All Fill Gates shall remain open to allow water to flow through lock during Safe Mode.

3. Lock Safe Operating Sequence – Downstream Ready:

a. Initial Conditions:

1) Upper Lock Gates closed.
2) Lower Lock Gates open.
3) Emptying Gates all open.
4) Fill Gates all closed.

b. To place lock into Lock Safe Mode when Downstream ready, system shall:

1) Close Downstream Lock Gates by starting VFD-LG-DE and VFD-LG-DW in reverse.

a) Stop VFD-LG-DE when LM-LG-DE-CL makes.
b) Stop VFD-LG-DW when LM-LG-DW-CL makes.

2) Open all Fill Gates by starting VFD-FG-C, VFD-FG-UE, and VFD-FG-UW in forward after both Downstream Lock Gates full closed (LM-LG-DW-CL and LM-LG-DE-CL both made).

a) All Emptying Gates shall remain open to allow water to flow through lock during Safe Mode.

F. Automatic Sequence 4 – Lock Start from Safe Mode:

1. Operator shall select if lock is to start Upstream Ready or Downstream Ready.

2. Upstream Ready Lock Start Sequence: When selected by Operator, system shall:

a. Close all Emptying Gates by starting VFD-EG-CE, VFD-EG-CW, VFD-EG,DE, and VFD-EG-DW in reverse.

1) Stop VFD-EG-DE when LM-EG-DE-CL makes.
2) Stop VFD-EG-DW when LM-EG-DW-CL makes.
3) Stop VFD-EG-CE when LM-EG-CE-CL makes.
4) Stop VFD-EG-CW when LM-EG-CW-CL makes.

b. Open Upstream Lock Gates by starting VFD-LG-UE and VFD-LG-UW in forward when Lock Water Level equals Upstream Pool Water Level (LT-LOCK = LT-LOCK-U).

1) Stop VFD-LG-UE when LM-LG-UE-O makes.
2) Stop VFD-LG-UW when LM-LG-UW-O makes.

3. Downstream Ready Lock Start Sequence: When selected by Operator, system shall:

a. Close all Fill Gates by starting VFD-FG-C, VFD-FG-UE, and VFD-FG-UW in reverse.

1) Stop VFD-FG-UE when LM-FG-UE-CL makes.
2) Stop VFD-FG-UW when LM-FG-UW-CL makes.
3) Stop VFD-FG-C when LM-FG-C-CL makes.

b. Open Downstream Lock Gates by starting VFD-LG-DE and VFD-LG-DW in forward when Lock Water Level equals Upstream Pool Water Level (LT-LOCK = LT-LOCK-U).

1) Stop VFD-LG-DE when LM-LG-DE-O makes.
2) Stop VFD-LG-DW when LM-LG-DW-O makes.

G. Alarm and Fault Conditions:

1. Lock Miter Gate High Open or Close Force:

a. Each lock gate operator arm shall be provided with limit switches to detect high opening or closing force:

1) LM-LG-UW-HO
2) LM-LG-UW-HCL
3) LM-LG-UE-HO
4) LM-LG-UE HCL
5) LM-LG-DW-HO
6) LM-LG-DW HCL
7) LM-LG-DE-HO
8) LM-LG-DE HCL

b. When high open or close limit switch activates, the controls shall:

1) Stop both lock gate operators for the pair of lock gates that experienced the high force condition.
2) Initiate an alarm condition on the Lock Control System.
3) All lock fill and empty gates in operation at time of alarm condition shall continue to operate until current operation cycle (open or close) is complete.

2. Lock Fill or Empty Sluice Gate Operator High Torque:

a. Each lock fill or empty sluice gate operator shall be provided with two torque switches:

1) High torque alarm:

a) TS-FG-UE-H
b) TS-FG-UW-H
c) TS-FG-C-H
d) TS-EG-CE H
e) TS-EG-CW-H
f) TS-EG-DE H
g) TS-EG-DW-H

2) High torque shut-down:

a) TS-FG-UE-HH
b) TS-FG-UW-HH
c) TS-FG-C-HH
d) TS-EG-CE HH
e) TS-EG-CW-HH
f) TS-EG-DE HH
g) TS-EG-DW-HH

b. Activation of any High Torque Alarm torque switch shall only initiate an alarm condition on the Lock Control System.

c. When any High Torque Shut-Down torque switch activates, the controls shall:

1) Stop the associated sluicegate operator.
2) Initiate an alarm condition on the Lock Control System.
3) All other loads in operation at time of alarm condition shall continue to operate until current operation cycle (open or close) is complete.

3. VFD Fault:

a. All VFD faults shall initiate an alarm condition on the Lock Control System.
b. Fill or Empty Sluice Gate Operator VFD fault shall not cause any other loads to stop operation.
c. Should VFD Fault occur on one of the Lock Miter Gate Operator VFD's, the Lock Control System shall automatically stop the other Lock Miter Gate Operator VFD of the pair when the fault condition is detected.

II. Dam Control System Operating Sequence:

A. Torque Tube Gate Operation: See Operating Sequence in Hydraulically Hinged Crest Gate special provision.

B. Pneumatic Hinge Gate Operation (Algonquin Dam and McHenry PHG Dam):

1. Existing gates are currently operated by maintaining bladder air pressure through a manually set pressure regulator in the gate control panel located in the gatehouse at each dam.

2. Project shall provided automated controls to allow for remote monitoring and operation of existing pneumatic gate control system.

    a. Existing gate control panels shall remain connected to system.
    b. Isolation valves, monitored by the dam control system, shall be provided to isolate either the new automatic gate control system or the existing manual control panel.

3. New gate control system shall allow for two basic modes of operation for the existing pneumatic hinge gates:

    a. Remote Air Pressure Setpoint operation.
    b. Upstream Pool Water Level Setpoint operation.

4. Algonquin site shall be provided with a PLC control panel with communication link to the Stratton Lock and Dam site.

    a. Algonquin PLC shall be arranged to automatically assume control of Algonquin Dam should communication link between sites be lost.
    b. When Algonquin Dam is not in communication with Stratton Lock and Dam site, the Algonquin PLC shall maintain dam operation in whatever mode and setpoint entered into system when communications were lost.
    c. Algonquin Dam controls shall maintain these operating conditions until:

        1) System communications are restored
        2) Existing manual controls in the Algonquin gatehouse are engaged.

5. An alarms auto-dialer shall be provided at the Algonquin site to communicate alarms independently of the Dam Control System. The following conditions shall be communicated through this auto-dialer:

    a. Loss of communications between Algonquin Dam and Stratton Lock and Dam.
    b. Changes to Algonquin Dam setpoint value (even if setpoint change is initiated from the Stratton Lock and Dam site).
    c. Opening of Bladder Manual Control Panel isolation valve. Provide direct connection between this valve limit switch and the auto-dialer; do not rely on PLC for this alarm connection.
    d. Low bladder air pressure as initiated from pressure switch on bladder air supply pipe.

        1) Provide separate pressure switches for DCP-ALG low bladder air pressure alarm and auto-dialer low bladder air pressure alarm.
        2) Connect auto-dialer low bladder air pressure alarm pressure switch directly to auto-dialer.
        3) Set auto-dialer low air pressure switch setpoint lower than DCP-ALG low pressure switch setpoint.

6. Air Pressure Setpoint operation:

a. Operator shall enter a pressure setpoint into the control system.
b. Control system shall monitor gate bladder air pressure via pressure transducer located on bladder air supply pipe.

    1) System shall be provided with averaging or delay for bladder air pressure signal to minimize system from acting on momentary changes to air pressure readings caused by surging.

c. Control system shall either add or vent air from gate bladders as required to reach entered setpoint.

    1) Should entered air pressure be greater than current bladder pressure, system shall open motorized fill valve to increase bladder pressure to setpoint.
    2) Should entered air pressure be less than current bladder pressure, system shall open motorized vent valve to decrease bladder pressure to setpoint.

        a) Prior to releasing air to meet new entered setpoint below existing setpoint, system shall activate Gate Movement Warning Alarm sequence. See Gate Movement Warning Alarm operating sequence below for description.

d. When entered setpoint is reached, control system shall close motorized inflate or deflate valves.
e. Should measured bladder air pressure be below entered setpoint by a pre-set deadband value, then system shall open motorized inflate valve to add air into the gate bladders. Valve shall remain open until setpoint has been reached.
f. Should measured bladder air pressure be above entered setpoint by a preset deadband value, then system shall open motorized deflate valve to vent air from gate bladders. Valve shall remain open until setpoint has been reached.

7. Upstream Pool Water Level Setpoint operation:

a. Operator shall enter an upstream pool level setpoint into the system.
b. Control system shall monitor upstream pool water level via level transducer located in upstream pool.
c. Control system shall incrementally raise or lower dam gates as required to maintain upstream pool level:

    1) New setpoint value that is greater than the present upper pool water level value shall cause system to open bladder fill motorized valve to raise gate.
    2) New setpoint value that is less than the present upper pool water level value shall cause system to open bladder vent motorized valve to lower gate.

a) Prior to releasing air to meet new entered setpoint below existing setpoint, system shall activate Gate Movement Warning Alarm sequence. See Gate Movement Warning Alarm operating sequence below for description.

3) Dam controls shall utilize PID loop controls for gate movement to maintain upper pool water levels:

a) Gate movement shall increase as the difference between the upper pool water level and the setpoint gets greater.
b) Gate movement shall decrease as the difference between the upper pool water level and the setpoint gets less.
c) Gate elevation shall be held steady when upper pool water level holds steady at the setpoint.
d) Gate shall start moving in opposite direction when upper pool water level crosses setpoint.

C. Gate Movement Warning Alarm Sequence:

1. Gate Movement Warning Alarms shall be provided for:

a. Existing Algonquin Dam.
b. Existing McHenry PHG Dam.
c. New McHenry gate structure.

2. Gate Movement Warning Alarm Sequence shall be activated prior to gate movement whenever dam gate operation would result in gates being lowered rapidly, causing an increase in downstream water flow:

a. Entering of setpoint that is lower than present operating setpoint.
b. Manual lowering/opening of gates.

3. After entering lower setpoint or calling for gate to be lowered manually, system shall perform the following functions:

a. Delay gate movement for one (1) minute.
b. Activate Gate Movement Warning strobes located on new and existing gate structures.

1) Gate Movement Warning Strobes shall be provided with a duration timer which shall automatically deactivate strobes when timer expires:

a) Duration timer shall be operator adjustable.
b) Duration timer range shall be between 1 and 30 minutes.
c) Initially set timer at 10 minutes.

c. Activate Gate Movement Warning Horns located on gate structure:

1) Gate Movement Warning Horns shall be provided with a duration timer which shall automatically deactivate horns when timer expires:

a) Duration timer shall be operator adjustable.
b) Duration timer range shall be between 1 and 60 seconds.
c) Initially set timer at 10 seconds.

2) Gate Movement Warning Horns shall be provided with time of day controls which shall prevent horns from sounding when activated.

a) Time clock shall automatically adjust for daylight savings time.
b) Silence period start and end times shall be user adjustable.

4. Provide controls on Dam Control System HMI display screens which will allow operator to manually initiate Gate Movement Warning Alarm for any of the dam gates.
5. Provide pushbutton on cover of DCP-ALG, DCP-PHG, and DCP-SGS which will allow operator to manually activate Gate Movement Warning Horns and Strobes for the dam the control panel is located at:

1) Warning horns shall sound continuously as long as pushbutton is depressed.
2) Provide delay-on-release timing relay (.3-30 minute timer range, initially set at 10 minutes) to continue operation of warning strobes after release of pushbutton until timing relay expires.

III. Alarms Operating Sequence:

A. Alarms reporting, including programming of the system auto-dialer phone numbers and messages shall be approved by the department. Auto-dialer programming shall be performed during system commissioning/start-up.

B. Alarm System Functions – Basic Operation:

1. Basic operating sequence for alarms:

	System Condition	**Touch Screen Alarm Display**	**Audible Alarms**	**Alarm Strobes**
a.	Normal-Sleep	Off	Off	Off
b.	Alarm	Flash Red	On*	On
c.	Acknowledge	Steady On Red	Off	Off
d.	Reset to Normal	Steady On Green	Off	Off
e.	Bypass	Steady On Amber	Off	Off

* If selected to be activated by the system.

2. Each alarm input shall be provided with an individually adjustable Alarm Initiation Timer to minimize system false alarm conditions:

a. Alarm Initiation Timer shall be adjustable from 0 to 60 seconds.
b. Should initiating alarm condition return to normal prior to expiration of Alarm Initiation Timer, alarm initiation shall be cancelled and timer shall reset. Alarm initiation shall only occur if alarm condition remains continuously throughout alarm initiation timer period.

3. At expiration of the Alarm Initiation Timer, the alarm condition shall be logged onto the system as an incoming alarm.

   a. Alarm condition shall be displayed immediately on the operator interface screen.
   b. System alarm horns and strobes shall be activated.
   c. If the alarm is not acknowledged on the system prior to expiration of horn duration timer, the alarm horns will be silenced.
   d. Alarm Strobes shall continue to operate until alarm condition is acknowledged on the system.
   e. Upon alarm acknowledgement, both audible alarms and alarm strobes shall be turned off.

4. Active alarms can be acknowledged by the system touch screen display system or the system auto-dialer. When an active alarm is acknowledged:

   a. The system audible and visual alarms will be de-energized.
   b. Alarm input to the system auto-dialer will be cancelled.
   c. An Alarm Resound Timer shall be activated for the alarm condition:

      1) Timer shall be adjustable between 1 and 6 hours.
      2) Single resound duration setting for all alarms shall be acceptable.

   d. Should alarm resound timer expire before the alarm point has been returned to normal or alarm point placed into bypass, the alarm shall be re-initiated as a new alarm condition, initiating alarm sequence for the point as described above.

5. Each system alarm condition shall be provided with a Bypass function to enable or disable that individual alarm condition:

   a. Alarm Bypass controls shall be available on an alarm management screen for every system alarm condition.
   b. Alarm enable/disable functions shall be logged in the alarm history; however, disabling an alarm shall not cause a system alarm condition.

6. System alarms shall be transmitted to the process instrumentation and alarm system auto-dialer:

   a. Each alarm shall be independently assignable to any one of the auto-dialer channels.
   b. Upon alarm initiation, an auto-dialer activation timer shall be started to prevent alarms from being transmitted to the auto-dialer until timer has expired:

1) Timer shall be adjustable between 0 and 10 minutes.
2) Single dialer time delay setting for all alarm inputs shall be acceptable.

c. Upon expiration of the timer, if the alarm condition has not acknowledged, the alarm condition shall be output to the selected auto dialer channel.
d. Alarms shall be capable of being acknowledged by personnel via the dialer.

7. Once the alarm input returns to normal:

a. Acknowledged alarms shall automatically reset to normal condition.
b. Unacknowledged alarms shall continue as active alarms until acknowledged; once acknowledged alarm will reset to normal condition.

8. Each alarm occurrence shall be logged by the system and displayed on an alarm history screen.

a. The following alarm system occurrences shall be logged on the alarm history screen:

1) Alarm initiation.
2) Alarm acknowledgement.
3) Alarm return to normal.
4) Change in alarm monitoring status from Enabled to Disabled or vice-versa.

b. The alarm history screen shall indicate the following for each occurrence:

1) The name of the alarm point.
2) The date and time the event occurred.
3) Description of the type of occurrence.

c. All alarm system occurrences shall be displayed in order, with the most recent event at the top of the list.
d. Provide the following controls on the alarm history screen:

1) Scroll Up and Scroll Down buttons to scroll between individual alarm occurrence entries one at a time.
2) Page Up and Page Down buttons to scroll between a complete screen of alarm occurrence entries.

e. The alarm history list shall be capable of saving up to 5000 alarm occurrence entries. Once the alarm occurrence limit has been reached, the oldest alarm occurrence entries shall be automatically deleted from the list as new alarm occurrences are added.

9. Time of Day/Day of Week clock program shall be provided for Dam Control System to allow for different alarm notification sequences for daytime/nighttime and weekday/weekend periods:

a. Provide an electronic time clock module at DCP-SB for control of this feature:

1) Clock shall be seven (7) day program type capable of accepting different on/off programs each day during the week.
2) Clock shall be capable of providing a minimum of two (2) on/off program cycles each day.
3) Clock shall be provided with quick-set feature to allow the same program to be entered for weekdays, weekends, and every day.
4) Clock shall be electronic type with battery back-up capable of retaining clock time and date during a power outage.
5) Clock shall automatically adjust for daylight savings time.

b. Each clock program period shall be capable of being set to perform the following alarm annunciation sequences:

1) Horns/strobes only.
2) Horns/strobes with auto-dialer.
3) Strobes only with auto-dialer.
4) Auto-Dialer only.

c. Master control selector shall be provided to allow this feature to be enabled or disabled. When disabled, all alarms shall be annunciated by both horns/strobes and the Auto-Dialer.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION – CONTROL LOOP DESCRIPTIONS

CONTROL PANELS AND ENCLOSURES

GENERAL

I. SUMMARY

A. Section Includes:

1. Requirements for control panels and enclosures.

II. QUALITY ASSURANCE

A. Referenced Standards:

1. American National Standards Institute (ANSI).
2. National Electrical Manufacturers Association (NEMA):

a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
b. ICS 4, Industrial Control and Systems: Terminal Blocks.

3. National Fire Protection Association (NFPA):

a. 70, National Electrical Code (NEC):

1) Article 409, Industrial Control Panels.

4. Underwriters Laboratories, Inc. (UL):

a. 508A, Standard for Safety Industrial Control Panels.

B. Miscellaneous:

1. Approved supplier of Industrial Control Panels under provisions of UL 508A.

a. Entire assembly shall be affixed with a UL 508A label "Listed Enclosed Industrial Control Panel" prior to shipment to the jobsite.
b. Control panel(s) without an affixed UL 508A label shall be rejected and sent back to the Contractor’s factory.

III. DEFINITIONS

A. The term "panel" refers to control panels or enclosures listed in the schedule included in this Specification Section.

B. Foreign Voltages: Voltages that may be present in circuits when the panel main power is disconnected.

C. Intrinsically Safe:

1. A device, instrument or component that will not produce sparks or thermal effects under normal or abnormal conditions that will ignite a specified gas mixture.
2. Designed such that electrical and thermal energy limits inherently are at levels incapable of causing ignition.

D. Cable: Multi-conductor, insulated, with outer sheath containing either building wire or instrumentation wire.

E. Instrumentation Cable:

1. Multiple conductor, insulated, twisted or untwisted, with outer sheath.
2. Instrumentation cable is typically either TSP (twisted-shielded pair) or TST (twisted-shielded triad), and is used for the transmission of low current or low voltage signals.

F. Ground Fault Circuit Interrupter (GFCI): A type of device (e.g., circuit breaker or receptacle) which detects an abnormal current flow to ground and opens the circuit preventing a hazardous situation.

G. Programmable Logic Controller (PLC): A specialized industrial computer using programmed, custom instructions to provide automated monitoring and control functions by interfacing software control strategies to input/output devices.

H. Remote Terminal Unit (RTU): An industrial data collection device designed for location at a remote site, that communicates data to a host system by using telemetry such as radio, dial-up telephone, or leased lines.

I. Input/Output (I/O): Hardware for the moving of control signals into and/or out of a PLC or RTU.

J. Supervisory Control and Data Acquisition (SCADA): Used in process control applications, where programmable logic controllers (PLCs) perform control functions but are monitored and supervised by computer workstations.

K. Highway Addressable Remote Transducer (HART): An open, master-slave protocol for bus addressable field instruments.

L. Digital Signal Cable: Used for the transmission of digital communication signals between computers, PLCs, RTUs, etc.

M. Uninterruptible Power Supply (UPS): A backup power unit that provides continuous power when the normal power supply is interrupted.

N. Loop Calibrator: Portable testing and measurement tool capable of accurately generating and measuring 4-20ma DC analog signals.

IV. SUBMITTALS

A. Shop Drawings:

1. Prepared with computer aided design (CAD) software.
2. Printed on 11 by 17 IN sheets.

3. Drawings shall include a title block containing the following:

    a. Plant or facility name where panel(s) are to be installed.
    b. Drawing title.
    c. Drawing number.
    d. Revision list with revision number and date
    e. Drawing date.
    f. Drawing scale.
    g. Manufacturer name, address, and telephone number.

4. Cover sheet for each drawing set shall indicate the following:

    a. Plant or facility name.
    b. Project name.
    c. Submittal description.
    d. Revision number.
    e. Issue date.

5. Table of contents sheet(s) shall indicate the following for each drawing in the set:

    a. Drawing number.
    b. Drawing title.
    c. Sheet number.

6. Legend and abbreviation sheet shall indicate the following:

    a. Description of symbols and abbreviations used.
    b. Panel construction notes including enclosure NEMA rating, finish type and color, wire type, wire color strategy, conductor sizes, and wire labeling strategy.
    c. Confirmation that the panel(s) are to be affixed with a UL 508A label prior to shipment from the factory.

7. Bill of Material for each panel shall include the following component information:

    a. Instrument tag number.
    b. Quantity.
    c. Functional name or description.
    d. Manufacturer.
    e. Complete model number.
    f. Size or rating.

8. Panel exterior layout drawings to scale and shall indicate the following:

    a. Panel materials of construction, dimensions, and total assembled weight.
    b. Panel access openings.
    c. Conduit access locations.
    d. Front panel device layout.
    e. Nameplate schedule:

        1) Nameplate location.

2) Legend which indicates text, letter height and color, and background color.

f. Alarm annunciator window engraving schedule.
g. Layouts of graphic panels or mosaic displays.

9. Panel interior layout drawings shall be drawn to scale and shall indicate the following:

a. Sub-panel or mounting pan dimensions.
b. Interior device layouts.
c. PLC/RTU general arrangement layouts.
d. Wire-way locations, purpose, and dimensions.
e. Terminal strip designations.
f. Location of external wiring and/or piping connections.
g. Location of lighting fixtures, switches and receptacles.

10. Wiring diagrams shall consist of the following:

a. Panel power distribution diagrams.
b. Control and instrumentation wiring diagrams.
c. PLC/RTU I/O information:

1) Model number of I/O module.
2) Description of I/O module type and function.
3) Rack and slot number.
4) Terminal number on module.
5) Point or channel number.
6) Programmed point addresses.
7) Signal function and type.

d. Wiring diagrams shall identify each wire as it is to be labeled.

B. Manufacturer catalog cut sheets for enclosure, finish, panel devices, control auxiliaries, and accessories.

C. Electrical load calculations for each panel:

1. Total connected load.
2. Peak electrical demand for each panel.

D. Climate control calculations for each panel.

1. Verify that sufficient dissipation and/or generation of heat is provided to maintain interior panel temperatures within the rated operating temperatures of panel components.

E. Miscellaneous:

1. Record Drawings:

a. Updated panel drawings delivered with the panel(s) from the Contractor's factory.
b. Drawings shall be enclosed in transparent plastic and firmly secured within each panel.

F. Operation and Maintenance Manuals.

PRODUCTS

I. ACCEPTABLE MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

1. Enclosures:

a. Hoffman Engineering Co.
b. Rittal.
c. Hammond Manufacturing.
d. Millbank Mfg. Co.

2. Panel heaters:

a. Hoffman Enclosures, Inc.
b. Rittal.
c. Hammond Manufacturing.

3. Heat exchangers and air conditioners:

a. Hoffman Enclosures, Inc.
b. Rittal.
c. Hammond Manufacturing.

4. Cooling fans and exhaust packages:

a. Hoffman Enclosures, Inc.
b. Rittal.

5. Internal corrosion inhibitors:

a. Hoffman Enclosures, Inc.; Model A-HCI.
b. Northern Technologies International Corporation (NTIC); Model Zerust VC.
c. Cortec Corporation; Model VpCl Emitting Systems.

II. FABRICATION

A. General:

1. Fabricate panels with instrument arrangements and dimensions identified in the Contract Documents.

2. Provide panel(s) with the required enclosure rating per NEMA 250 to meet classifications identified in the Contract Documents.
3. Devices installed in panel openings shall have a NEMA enclosure rating at least equal to the panel enclosure rating.

    a. Devices that cannot be obtained with an adequate NEMA rating shall be installed behind a transparent viewing window.
    b. The window shall maintain the required NEMA rating of the enclosure.

4. Panel(s) shall be completely assembled at the Contractor's factory.

    a. No fabrication other than correction of minor defects or minor transit damage shall be performed on panels at the jobsite.

5. Painting:

    a. Panels fabricated from steel shall have their internal and external surfaces prepared, cleaned, primed, and painted.

        1) Mechanically abrade all surfaces to remove rust, scale, and surface imperfections.
        2) Provide final surface treatment with 120 grit abrasives or finer, followed by spot putty to fill all voids.
        3) Utilize solvent or chemical methods to clean panel surfaces.
        4) Apply surface conversion of zinc phosphate prior to painting to improve paint adhesion and to increase corrosion resistance.
        5) Electrostatically apply polyester urethane powder coating to all inside and outside surfaces.
        6) Bake powder coating at high temperatures to bond coating to enclosure surface.

            a) Panel interior shall be white with semi-gloss finish.
            b) Panel exterior shall be ANSI #61 gray with flat finish.

        7) Application of alkyd liquid enamel coating shall be allowed in lieu of polyester urethane powder for wall mounted NEMA 1 or NEMA 12 rated panels.

    b. Panels fabricated from stainless steel, aluminum, or fiberglass shall not be painted.

6. Finish opening edges of panel cutouts to smooth and true surface conditions.

    a. Panels fabricated from steel shall have the opening edges finished with the panel exterior paint.

7. Panel shall meet all requirements of UL 508A.

a. If more than one (1) disconnect switch is required to disconnect all power within a panel or enclosure, provide a cautionary marking with the word "CAUTION" and the following or equivalent, "Risk of Electric Shock-More than one (1) disconnect switch required to de-energize the equipment before servicing."

8. Provide control panel in accordance with NFPA 70, Article 409.

a. In the event of any conflict between NFPA 70, Article 409 and UL 508A, the more stringent requirement shall apply.

B. Free-Standing Panels:

1. Welded construction.
2. Completely enclosed, self-supporting, and gasketed dusttight.
3. Rolled lip around all sides of enclosure door opening.
4. Seams and corners welded and ground smooth to touch and smooth in visual appearance.
5. Full height, fully gasketed flush pan doors.
6. Full length piano hinges rated for 1.5 times door plus instrument weight.
7. Doors with keyed alike locking handles and three-point catch.
8. Appropriate conduit, wiring, and instrument openings shall be provided.
9. Lifting eyebolts to allow simple, safe rigging and lifting of panel during installation.

C. Wall Mounted Panels:

1. Seams continuously welded and ground smooth.
2. Rolled lip around all sides of enclosure door opening.
3. Gasketed dust tight.
4. Three-point latching mechanism operated by oil tight key-locking handle.
5. Key doors alike.
6. Continuous heavy GA hinge pin on doors.
   a. Hinges rated for 1.5 times door plus instrument weight.
7. Front full opening door.
8. Brackets for wall mounting.

D. Internal Panel Wiring:

1. Panel wire duct shall be installed between each row of components, and adjacent to each terminal strip.

   a. Route wiring within the panel in wire-duct neatly tied and bundled with tie wraps.
   b. Follow wire-duct manufacturer's recommended fill limits.
   c. Wire-duct shall have removable snap-on covers and perforated walls for easy wire entrance.
   d. Wire-duct shall be constructed of nonmetallic materials with rating in excess of the maximum voltage carried therein.

2. Wiring shall be installed such that if wires are removed from one (1) device, source of power will not be disrupted to other devices.

3. Splicing and tapping of wires permitted only at terminal blocks.
4. Wire bunches to doors shall be secured at each end so that bending or twisting will be around longitudinal axis of wire.

    a. Protect bend area with sleeve.

5. Arrange wiring neatly, cut to proper length, with surplus wire removed.

    a. Arrange wiring with sufficient clearance.
    b. Provide abrasion protection for wire bundles that pass through openings or across edges of sheet metal.

6. AC circuits shall be routed separate from analog signal cables and digital signal cables.

    a. Separate by at least 6 IN, except at unavoidable crossover points and at device terminations.

7. Provide at least 6 IN of separation between intrinsically safe devices and circuits and non-intrinsically safe devices and circuits.
8. Wiring to pilot devices or rotary switches shall be individually bundled and installed with a "flexible loop" of sufficient length to permit the component to be removed from panel for maintenance without removing terminations.
9. Conductors for AC and DC circuits shall be type MTW stranded copper listed for operation with 600 V at 90 DegC.

    a. Conductor size shall be as required for load and 16 AWG minimum.
    b. Internal panel wiring color code:

        1) AC circuits:

            a) Power wiring: Black.
            b) Control interconnections: Yellow.
            c) Neutral: White.
            d) Ground: Green.

        2) Low voltage DC circuits:

            a) Power wiring: Blue.
            b) Control interconnections: Violet.

        3) Foreign voltage circuits: Pink.
        4) Annunciator circuits: Red.
        5) Intrinsically safe circuits: Orange.

10. Analog signal cables shall be of 600 V insulation, stranded copper, twisted-shielded pairs.

    a. Conductor size: 18 AWG minimum.
    b. Terminate shield drain conductors to ground only at one (1) end of the cable.

11. High precision 250 ohm resistors with 0.25 percent accuracy shall be used where 4-20 mA DC analog signals are converted to 1-5 Vdc signals.

    a. Resistors located at terminal strips.
    b. Resistors terminated using individual terminal blocks and with no other conductors.
    c. Resistor leads shall be un-insulated and of sufficient length to allow test or calibration equipment (e.g., HART communicator, loop calibrator) to be properly attached to the circuit with clamped test leads.

12. Analog signals for devices in separate enclosures shall not be wired in series.

    a. Loop isolators shall be used where analog signals are transmitted between control enclosures.

13. Wire and cable identification:

    a. Wire and cables numbered and tagged at each termination.
    b. Wire tags:
        1) Slip-on, PVC wire sleeves with legible, machine-printed markings.
        2) Adhesive, snap-on, or adhesive type labels are not acceptable.
    c. Markings as identified in the Shop Drawings.

E. Grounding Requirements:

1. Equipment grounding conductors shall be separated from incoming power conductors at the point of entry.
2. Minimize grounding conductor length within the enclosure by locating the ground reference point as close as practical to the incoming power point of entry.
3. Bond electrical racks, chassis and machine elements to a central ground bus.

    a. Nonconductive materials, such as paint, shall be removed from the area where the equipment contacts the enclosure.

4. Bond the enclosure to the ground bus.

    a. It is imperative that good electrical connections are made at the point of contact between the ground bus and enclosure.

5. Panel-mounted devices shall be bonded to the panel enclosure or the panel grounding system by means of locknuts or pressure mounting methods.
6. Sub-panels and doors shall be bonded to ground.

F. Termination Requirements:

1. Wiring to circuits external to the panel connected to interposing terminal blocks.
2. Terminal blocks rigidly mounted on DIN rail mounting channels.
3. Terminal strips located to provide adequate space for entrance and termination of the field conductors.
4. One (1) side of each strip of terminal blocks reserved exclusively for the termination of field conductors.

5. Terminal block markings:

    a. Marking shall be the same as associated wire marking.
    b. Legible, machine-printed markings.
    c. Markings as identified in the shop drawings.

6. Terminal block mechanical characteristics, and electrical characteristics shall be in accordance with NEMA ICS 4.
7. Terminal blocks with continuous marking strips.

    a. Each terminal block shall be identified with machine printed labels.

8. Terminals shall facilitate wire sizes as follows:

    a. 120 Vac applications: Conductor size 12 AWG minimum.
    b. Other: Conductor size 14 AWG minimum.

9. Analog signal cable shield drain conductors shall be individually terminated.
10. Install minimum of 20 percent spare terminals.
11. Bladed, knife switch, isolating type terminal blocks where control voltages enter or leave the panel.
12. Fused terminal blocks shall be used in the following circuits:

    a. Control voltage is used to energize a solenoid valve.
    b. DC power is connected to 2-wire, loop-powered instruments.

13. Fused terminal blocks shall be provided with blown fuse indicators.
14. When control circuits require more than one (1) field conductor connected to a single wiring point, a sufficient number of terminal points shall be connected internally to allow termination of only one (1) field conductor per terminal block.
15. DIN rail mounting channels shall be installed along full length of the terminal strip areas to facilitate future expansion.
16. Connections to devices with screw type terminals shall be made using spade-tongue, insulated, compression terminators.

G. Component Mounting and Placement:

1. Components shall be installed per manufacturer instructions.
2. Control relays and other control auxiliaries shall be mounted on DIN rail mounting channels where practical.
3. Front panel devices shall be mounted within a range of 40 to 70 IN above the finished floor, unless otherwise shown in the Contract Documents.
4. PLC/RTU and I/O rack installation:

    a. Located such that the LED indicators and switches are readily visible with the panel door open.
    b. Located such that repair and/or replacement of component can be accomplished without the need to remove wire terminations or other installed components.

5. Locate power supplies with sufficient spacing for circulation of air.

6. Where components such as magnetic starters, contactors, relays, and other electromagnetic devices are installed within the same enclosure as the PLC/RTU system components, provide a barrier of at least 6 IN of separation between the "power area containing the electromagnetic devices" and the "control area".
7. Components mounted in the panel interior shall be fastened to an interior sub-panel using machine screws.

    a. Fastening devices shall not project through the outer surface of the panel enclosure.

8. Excess mounting space of at least 20 percent for component types listed below to facilitate future expansion:

    a. Fuse holders.
    b. Circuit breakers.
    c. Control relays.
    d. Time delay relays.
    e. Intrinsically safe barriers and relays.

9. Components installed on sub-panels shall be provides with a minimum spacing between component and wire duct of 1 IN.

    a. Minimum of 2 IN separation between terminal strips and wire ducts.

H. Power Distribution:

1. Main incoming power circuits shall be protected with a thermal magnetic circuit breaker.
   Limit load to maximum of 80 percent of circuit breaker rating.
2. Component types listed below shall be individually fused so that they may be individually de-energized for maintenance:

    a. PLC/RTU power supply modules.
    b. Single-loop controllers.
    c. Recorders.
    d. Alarm annunciators.

3. Each control panel with PLC/RTU components shall be furnished with power protection in the form of a double conversion UPS.
4. Equip each panel with necessary power supplies with ratings required for installed equipment and with minimum 25 percent spare capacity.
5. Constant voltage transformers, balancing potentiometers, and rectifiers as necessary for specific instrument requirements.

I. Internal Panel Lighting and Service Receptacles:

1. Panels less than or equal to 4 FT wide:

    a. One (1) electrical GFCI duplex receptacle.
    b. One (1) LED light fixture with door switch.

2. Panels or panel faces greater than 4 FT wide:

    a. One (1) duplex electrical GFCI receptacle per 6 FT of length.
    b. Continuous LED lighting strip with door switch.

J. Environmental Controls:

1. Indoor panels located in a designated electrical room or control room:

    a. Thermostat controlled cooling fans with exhaust louvers if required to maintain temperature inside panel(s) below the maximum operating temperature rating of the internal components.
    b. Internal corrosion inhibitors.

2. Indoor panels not located within a designated electrical room or control room:

    a. Thermostat controlled heaters to maintain temperature approximately 10 DegF above ambient for condensation prevention inside the panels.
    b. Automatically controlled, closed-loop heat exchangers or closed-loop air conditioners where required to maintain temperature inside each enclosure below the maximum operating temperature rating of the components inside the panel(s).
    c. Internal corrosion inhibitors.

3. Outdoor panels:

    a. Outdoor temperature range of -40 DegF through 120 DegF.
    b. Thermostat controlled heaters to maintain temperature approximately 10 DegF above ambient for condensation prevention inside the panels.
    c. Thermostat controlled closed-loop heat exchangers or closed-loop air conditioners if required to maintain temperature inside each enclosure below the maximum operating temperature rating of the components inside the panel.
    d. Internal corrosion inhibitors.

4. Environmental control components:

    a. Panel heaters:

        1) Thermostat controlled.
        2) Fan driven.
        3) Components mounted in an anodized aluminum housing.
        4) Designed for sub-panel mounting.
        5) Powered from 120 Vac and protected with a dedicated circuit breaker.

    b. Cooling fans and exhaust packages:

        1) Cooling fan with louver or grill and replaceable filter.
        2) Designed to be mounted within a panel cutout to provide positive airflow through the panel.

3) Cooling fan and exhaust louvers shall be designed and listed to maintain a NEMA 12 enclosure rating.
4) Fitted with replaceable, high-density foam or synthetic fiber.
5) Cooling fan controlled with a separately mounted thermostat with bi-metal sensor and adjustable dial for temperature setting.
6) Powered from 120 Vac and protected with a dedicated circuit breaker.

c. Heat exchangers and air conditioners:

1) Dual-loop design to isolate panel interior air from exterior air.
2) hermostat controlled.
3) Operate from 120 Vac and protected with a dedicated circuit breaker.

d. Internal corrosion inhibitors:

1) Contains chemical which vaporizes and condenses on surfaces in the enclosure.
2) Inhibitor shall be applied in accordance with manufacturer instructions for the enclosure volume.
3) Inhibitor shall be applied in the panel(s) prior to shipment from the Contractor's factory.

III. MAINTENANCE MATERIALS

A. Extra Materials:

1. Quantity of 25 percent replacement lamps for each type installed (minimum of 12 of each type).
2. Minimum 12 replacement filters for each type installed.
3. One (1) quart of exterior finish touch-up paint.
4. One (1) complete set of replacement corrosion inhibitors in sealed packages for each panel.

EXECUTION

I. FACTORY TESTING

A. Scope: Inspect and test entire panel assembly to verify readiness for shipment.

B. Location: Contractor's factory.

C. Factory Tests:

1. Tests shall be fully documented and signed by the Contractor's factory supervisor.
2. The panel shop shall fully test the control panel for correct wiring.

a. Each I/O point shall be checked by measuring or connecting circuits at the field terminal blocks.

3. Burn-in test: Panel(s) shall be fully energized for a minimum period of 48 HRS.

4. A PLC Central Processing Unit (CPU) shall be obtained and connected to the panel(s) if necessary for testing purposes.
5. Testing equipment (such as digital multi-meters, analog loop calibrators, and laptop computers with PLC programming software) shall be used as required for testing.
6. The following functions shall be tested as a minimum:

    a. Demonstrate functions of the panel(s) required by the Contract Documents.
    b. Correctness of wiring from all panel field terminals to all I/O points and to all panel components.
    c. Simulate and test each discrete signal at the field terminal strips.
    d. Simulate and test each analog signal using loop calibrators.
    e. Correct operation of communications between PLC system Central Processing Units (CPUs) and Remote I/O bases.
    f. Correct operation of single-loop controllers (including digital communication to microprocessor based devices).
    g. Correct operation of all digital communication devices.
    h. Demonstrate online and offline diagnostic tests and procedures.
    i. The Contractor shall notify the Engineer in writing a minimum of 15 calendar days prior to the Factory Tests.
    j. Engineer has the option to witness all required tests.

7. Make following documentation available to the Engineer at test site during the tests:

    a. Contract Documents.
    b. Factory Demonstration Testing procedures.
    c. List of equipment to be testing including make, model, and serial number.
    d. Shop Drawing submittal data for equipment being tested.

8. Deficiencies shall be corrected prior to shipment from the Contractor's factory.

II. INSTALLATION

A. Install free-standing panels on 4 IN high concrete housekeeping pads.

B. Anchor panels in a manner to prevent the enclosure from racking, which may cause the access doors to become misaligned.

C. Obtain approved panel layouts prior to installation of conduits.

D. Install products in accordance with manufacturer's instructions.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION – CONTROL PANELS AND ENCLOSURES

DOOR HARDWARE

GENERAL

I. This Section includes commercial door hardware for swing doors and pocket doors for the Lockhouse and the Gate Structure.

II. SUBMITTALS

A. Product Data: Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule.

C. Warranty: Special warranty specified in this Section.

D. Other Action Submittals:

1. Door Hardware Sets: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final door hardware sets with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware:

a. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.
b. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
c. Content: Include the following information:

1) Identification number, location, hand, fire rating, and material of each door and frame.
2) Type, style, function, size, quantity, and finish of each door hardware item.
3) Complete designations of every item required for each door or opening including name and manufacturer.
4) Fastenings and other pertinent information.
5) Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
6) Explanation of abbreviations, symbols, and codes contained in schedule.
7) Mounting locations for door hardware.
8) Door and frame sizes and materials.
9) Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems:

a) Sequence of Operation: Include description of component functions that occur in the following situations: authorized person wants to enter; authorized

person wants to exit; unauthorized person wants to enter; unauthorized person wants to exit.

10) List of related door devices specified in other Sections for each door and frame.

d. 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.

2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Department's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.

III. 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 being available during the course of the Work to consult with Contractor, Engineer, and Department about door hardware and keying.
2. Installer shall have warehousing facilities in Project's vicinity.
3. Scheduling Responsibility: Preparation of door hardware and keying schedules.

B. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated:

1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

IV. 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.

C. Deliver keys to manufacturer of key control system for subsequent delivery to Department.

V. 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.

VI. 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:

1. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of operators and door hardware.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Three (3) years from date of Substantial Completion, except as follows:

a. Manual Closers: Ten (10) years from date of Substantial Completion.

VII. MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Department's continued adjustment, maintenance, and removal and replacement of door hardware.

MATERIAL REQUIEMENTS

I. SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in this Section and door hardware sets indicated in Part 3 "Door Hardware Sets" Article:

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.

B. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

II. HINGES, GENERAL

A. Quantity: Provide the following, unless otherwise indicated:

1. Three (3) Hinges: For doors with heights 61 to 90 in.

2. Continuous Edge Mount Hinges: For Level 3 Doors at the Gate Structure.

B. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

C. Hinge Weight: Unless otherwise indicated, provide the following:

1. Entrance Doors: Heavy-weight hinges.
2. Doors with Closers: Antifriction-bearing hinges.

D. Hinge Base Metal: Unless otherwise indicated, provide the following:

1. Exterior Hinges: Stainless steel, with stainless-steel pin.

E. Hinge Options: Where indicated in door hardware sets or on Drawings:

1. 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.
2. Corners: Square.

F. Fasteners: Comply with the following:

1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
2. Screws: Phillips flat-head; machine screws (drilled and tapped holes) for metal doors. Finish screw heads to match surface of hinges.

III. HINGES

A. Butts and Hinges: BHMA A156.1. Listed under Category A in BHMA's "Certified Product Directory."

B. Continuous Hinges: ANSI A8134 Grade 1 and ANSI/BHMA Standard A156.26 Grade 1.

1. Material: 14 GA (0.075") Type 304 Stainless Steel
2. Frame Reinforcement: 16-GA channel for doors 200 lbs or heavier.
3. Finish: US32D Satin

C. Template Hinge Dimensions: BHMA A156.7.

D. Available Manufacturers: 5-Knuckle, Ball Bearing, Heavy Duty

1. Bommer Industries, Inc. (BI) – BB5006.
2. Hager Companies (HAG) – BB1199.
3. McKinney Products Company; an ASSA ABLOY Group company (MCK) – T4A3786.

E. Available Manufacturers: Continuous Stainless Steel, Edge Mount.

1. Hagar Companies (HAG): 790-900
2. ASSA ABLOY, Markar FM300

3. Ingersoll-Rand, IVES - 700

IV. 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.

B. Latches and Locks for Means of Egress Doors: Comply with NFPA 101. Latches shall not require more than 15 lbf to release the latch. Locks shall not require use of a key, tool, or special knowledge for operation.

C. Lock Trim:

1. Levers: Wrought:

a. BEST – 15.

2. Escutcheons (Roses): Wrought:

a. BEST –H.

3. Lockset Designs: Provide design indicated on Drawings or, if sets are provided by another manufacturer, provide designs that match those designated.

D. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

1. Deadbolts: Minimum 1 in. bolt throw.

E. Backset: 2-3/4 in., unless otherwise indicated.

F. 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:

1. Strikes for Auxiliary Deadlocks: BHMA A156.5.

V. 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:

a. Entrance – F01.
b. Store Room –F02
c. Pocket Door-F03

B. Mortise Locks: Stamped steel case with steel or brass part 6; BHMA A156.13, Grade 1, Series 1000:

1. Available Manufacturers:

a. Best Access Systems; Div. of The Stanley Works (BAS).
b. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SGT).
c. Schlage Commercial Lock Division; an Ingersoll-Rand Company (SCH).
d. Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL).

C. Pocket Door Locks: Full privacy pocket door locks that are required to meet ADAAG for handicap accessibility and offer an emergency access from exterior feature.

1. Available Products:

a. Basis of Design: Trimco model 1069 Pocket Door Pull as manufactured by Trimco Brass manufacturing Company, Inc, 3528 Emry Street, Los Angeles, CA. 90023. Phone: (323) 262-4191. Contact: Larry Squire.
b. Substitutions will be considered if equivalent to basis of design product.

VI. AUXILIARY LOCKS AND LATCHES

A. Auxiliary Locks: BHMA A156.5, Grade 1:

1. Available Manufacturers:

a. Best Access Systems; Div. of The Stanley Works (BAS).
b. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SGT).
c. Schlage Commercial Lock Division; an Ingersoll-Rand Company (SCH).
d. Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL).

VII. 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:

1. Number of Pins: Six (6).
2. Mortise-Lock Type: Cylinders with tailpieces to suit locks.

C. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:

1. Removable Cores: Core insert, removable by use of a special key; for use only with core manufacturer's cylinder and door hardware.

D. Construction Keying: Comply with the following:

1. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide ten (10) construction master keys.

E. Available Manufacturers:

1. Best Access Systems; Div. of The Stanley Works (BAS).
2. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SGT).
3. Schlage Commercial Lock Division; an Ingersoll-Rand Company (SCH).
4. Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL).

VIII. 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. Master Key System: Cylinders are operated by a change key and a master key.

B. Keys: Nickel silver:

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:

a. Notation: "DO NOT DUPLICATE." Information to be furnished by Department.

2. Quantity: In addition to one extra key blank for each lock, provide the following:

a. Cylinder Change Keys: Three (3).
b. Master Keys: Five (5).
c. Grand Master Keys: Five (5).
d. Great-Grand Master Keys: Five (5).

IX. 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)."

B. Door Closers for Means of Egress Doors: Comply with NFPA 101. Door closers shall not require more than 30 lbfto set door in motion and not more than 15 lbf to open door to minimum required width.

C. 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.

D. Surface Closers: BHMA A156.4, Grade 1. Provide type of arm required for closer to be located on interior side of door, unless otherwise indicated:

1. Available Manufacturers:

    a. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company (CR) – 4020 Series.
    b. LCN Closers; an Ingersoll-Rand Company (LCN) – 4000 Series.
    c. Norton Door Controls; an ASSA ABLOY Group company (NDC) – 7000 Series.

E. Coordinators: BHMA A156.3.

XVII. PROTECTIVE TRIM UNITS

A. Size: 1-1/2 in. less than door width on push side and 1/2 in. less than door width on pull side, by height specified in door hardware sets.

B. Fasteners: Manufacturer's standard machine or self-tapping screws.

C. Metal Protective Trim Units: BHMA A156.6; beveled top and two (2) sides; fabricated from the following material:

1. Material: 0.050 in. thick stainless steel.
2. Available Manufacturers:

    a. Hager Companies (HAG) – 194S.
    b. Hiawatha, Inc. (HIA).
    c. IVES Hardware; an Ingersoll-Rand Company (IVS) – 8400.
    d. Rockwood Manufacturing Company (RM) – J102.

XVIII. 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:

1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
2. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

C. Air Leakage: Not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283.

D. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

E. Gasketing Materials: ASTM D 2000 and AAMA 701/702.

F. Door Gasketing Available Manufacturers:

1. Hager Companies (HAG) – 726S.

2. National Guard Products (NGP) – 5050C.
3. Pemko Manufacturing Co. (PEM) – 588BL.

G. Overhead Drip Guards – Available Manufacturers:

1. Hager Companies (HAS) – 810SA.
2. National Guard Products (NGP) – 16A.
3. Pemko Manufacturing Co. (PEM) – 346C.

XIX. 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):"

1. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 in. high.

C. Thresholds for Means of Egress Doors: Comply with NFPA 101. Maximum 1/2 in. high.

D. Available Manufacturers:

1. Hager Companies (HAG) – 516SAS.
2. National Guard Products (NGP) – 8436DKB.
3. Pemko Manufacturing Co. (PEM) – 254X226AS.

CONSTRUCTION REQUIREMENTS

I. 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 Engineer:

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.

C. 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:

1. 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.

II. FINISHES

A. Standard: BHMA A156.18, as indicated in door hardware sets.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. 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.

III. EXAMINATION

A. 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.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

IV. PREPARATION

A. Steel Doors and Frames: Comply with DHI A115 Series:

1. Surface-Applied Door Hardware: Drill and tap doors and frames according to ANSI A250.6.

V. INSTALLATION

A. Mounting Heights: Mount door hardware units at heights indicated 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 Division 09

Sections. Do not install surface-mounted items until finishes have been completed on substrates involved:

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 07 Section 07920 "Joint Sealants."

VI. 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:

1. Door Closers: Unless otherwise required by authorities having jurisdiction, adjust sweep period so that, from an open position of 70°, the door will take at least three (3) seconds to move to a point 3 in.from the latch, measured to the leading edge of the door.

VII. CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

VIII. DEMONSTRATION

A. Engage a factory-authorized service representative to train Department's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

DOOR HARDWARE SETS

A. HW 01 Door(s) – 01, 02, 03:

1.	1 pr.	Continuous Hinges.
2.	1	Latchset F01.
3.	1	Cylinder.
4.	1	Closer.
5.	1 set	Gasketing.
6.	1	Overhead Drip Guard.

7. 1 Threshold.
8. 1 Kickplate – 10 in.

B. HW 02 Door(s) – 101, 104a and 104B:

1. 3 pr. Hinges.
2. 1 Latchset F01.
3. 1 Cylinder.
4. 1 Closer.
5. 1 set Gasketing.
6. 1 Threshold.
7. 1 Kickplate – 10 in.

C. HW 03 Door(s) – 102:

1. 3 pr. Hinges.
2. 1 Latchset F02.
3. 1 Cylinder.

D. HW 04 Door(s) – 103:

1. 1 Latchset F03.

BASIS OF PAYMENT

The work described in this special provision will not be paid for as a separate item, but shall be included in the bid price for the GATE STRUCTURE – DOORS, AND LOCKHOUSE – DOORS.

END OF SPECIAL PROVISION – DOOR HARDWARE

ELECTRIC HEAT TRANSFER

GENERAL

I. Provision includes Electric Unit Heaters

II. Regulatory Requirements

A. All work and installations of this Section shall comply with the recommended practices of the following:

1. ASHRAE
2. National Fire Prevention Association

III. Submittals

A. Shop Drawings: Contain equipment dimension and show all required factory and external connections, accessories required and full equipment ratings and capacities and performance characteristics.

B. Product Data: Submit manufacturer's published product data.

C. Submit manufacturer's recommendations and installation instructions.

IV. Delivery, Storage And Handling

A. Deliver and store products in factory wrapped packages which properly protect same against weather, damage and dirt.

B. Handle all products and equipment to avoid crushing, bending or damage to components or finished.

C. Where possible, store inside or when necessary to store outside, store above grade and enclose in waterproof wrapping.

D. Do not install any damaged units. Replace and return damaged units to manufacturer.

MATERIAL REQUIREMENTS

I. Unit Heater

A. Housing:

1. The cabinet shall be of heavy gauge steel, welded and phosphatized.
2. Front and back panels shall be removable to gain full access to element, motor and fan area.
3. Fan guard shall be painted to match heater for appearance and durability, with bird screen.
4. Heater(s) shall be furnished with attached wall bracket for horizontal mounting.

B. Control Box:

1. The control box, housing all heater wiring and controls, shall be located at the bottom of the heater.
2. Control box shall be equipped with a swingdown hinged cover to permit full access for installation and servicing without dismounting the heater.

C. Wiring: All heater and control wiring connections shall terminate in the control box.

D. Fan Motor:

1. Fan motor shall be totally enclosed, impedance protected and of unit bearing design with high starting and running torques.
2. Fan motor and controls shall operate directly from the line voltage.

E. Heating Element:

1. The heating element shall be warranted for five years and shall be of non-glowing design.
2. The heating element shall cover the entire air discharge area for uniform heating.

F. Thermal Cutout:

1. Thermal cutout shall be built into the system to automatically shut off heater in the event of overheating.
2. Thermal cutout shall be automatic resetting type that reactivates the heater when temperatures return to normal.

G. Disconnect Switch: Manufacturer provided disconnect switch for servicing.

H. Internal Summer Switch: Provide switch for warm weather fan operation.

I. Thermostat: Provide internal single pole thermostat with adjustable settings.

CONSTRUCTION REQUIREMENTS

I. General

A. All equipment shall be installed as shown on Drawings and as recommended by equipment manufacturer.

II. Unit Heater

A. Hang unit heater from structure securely.

B. Connect wiring.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – MECHANICAL WORK (HVAC) as shown on the Mechanical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – MECHANICAL WORK (HVAC) shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION - ELECTRIC HEAT TRANSFER

ELECTRICAL IDENTIFICATION SYSTEMS

GENERAL

I. Provision Includes identification of all electrical equipment.

II. References.

A. American National Standards Institute (ANSI):

1. ANSI A13.1 – Identification of Piping Systems.

B. National Fire Protection Association (NFPA):

1. NFPA 70 – National Electrical Code (NEC).

C. Underwriters Laboratories, Inc. (UL):

1. All products UL listed and labeled.

III. Submittals

A. Schedules: Submit a schedule of proposed engraved nameplates, listing:

1. Nameplates and lettering colors.
2. Plate and lettering sizes.
3. Text to be engraved.

B. Product Data: Submit manufacturer's product data for underground warning tape.

MATERIAL REQUIREMENTS

I. Equipment Identification Plates

A. Provide plates for all equipment consisting of machine engraved laminated plastic.

B. Colors shall be as noted below:

1. General use equipment shall have black lettering on white background.
2. Emergency equipment shall have white lettering on red background.
3. Provide other coloring for nameplates as noted.

C. All lettering on nameplates shall be in capital letters.

D. Type 1 Nameplate - Switchboards, Panelboards, MCC's, and other distribution type equipment:

1. Wording:

a. Line 1: Name as indicated on drawings (i.e. LP-1)

b. Line 2: Voltage, Phase, Wire (i.e. 120/280V, 3PH, 4W)
c. Line 3: Supply circuit designation (i.e. MDP #1)

2. Lettering:

a. Line 1: ½" Letters.
b. Remaining lines: ¼" Letters.

E. Type 2 Nameplate - Utilization equipment, separate motor starters, disconnects, and motors with remotely located starters:

1. Wording:

a. Line 1: Tag as indicated on drawings (i.e. CWP-1)
b. Line 2: Function of equipment (i.e. CHILLED WATER PUMP)
c. Line 3: Operating Voltage and Phase (i.e. 280V, 3PH)
d. Line 4: Supply circuit or remote starter designation (i.e. MCC-1 #1-3)

2. Lettering:

a. Lines 1&2: ¼" Letters.
b. Remaining lines: 1/8" Letters.

F. Type 3 Nameplate – MCC Starters, Distribution panel breakers or switch units:

1. Wording:

a. Line 1: Circuit number (i.e. MDP #1)
b. Line 2: Supplied equipment tag as indicated on drawings (i.e. PANEL LP-1)
c. Line 3: Location of item supplied by circuit, via room name and/or number (i.e. ELECTRIC RM 112A)

d. Provide separate MCC location nameplate on front cover of each MCC unit. See drawings.

2. Lettering:

a. All lines 1/8" lettering.

G. Size of nameplates shall be consummate to lettering on nameplate.

1. Provide minimum ¼" margins on all sides.
2. Spacing between lines shall equal size of lettering on following line.

H. See panelboard and MCC schedules on Drawings or other DIVISION 16 sections for nameplate types to be provided at specific locations.

II. Wiring Identification

A. Power wiring shall be color-coded.

1. Colors shall be integral pigment in the insulation for wire sizes #10 AWG and smaller.
2. Colored electrical grade tape shall be used to color-code wires #8 AWG and larger. Tape shall be applied to ends of all wires, minimum 1" wide brand applied in half-lap manner.

B. Color Coding Systems:

	System	Phase A	Phase B	Neutral
1.	120/240V, 1Ph	Black	Red	White
2.	Ground: Bare Copper or Green.			
3.	Switch leg-return: Purple.			
4.	Three Way & Four Way Switch Travelers: Pink.			

C. Identify wires at each termination and in all junction boxes, handholes, panels, switchboards, and other enclosures.

1. Permanent adhesive, pre-printed wire alphanumeric labels.
2. Plastic, non-removable wire tags.

III. Raceway Identification System

A. Each junction box cover above ceiling or exposed in room that receives no ceiling shall be labeled on the box cover identifying the circuit number(s) enclosed, voltage and the equipment served such as: LPB-32, copier, 120V.

B. Labeling on junction box cover shall be by permanent, machine-printed adhesive labels. Markers or pens will not be allowed for final identification system.

C. The following abbreviations shall be used on labels:

	Service	Abbreviation
1.	Lighting	LTG
2.	Receptacles	RECPT
3.	Fire alarm	FA
4.	Emergency Systems	EM
5.	Low voltage controls	CNTL
6.	Heating, Vent. and A.C.	HVAC

D. Provide machine printed permanent pipe labels on all conduits identifying voltage, purpose, and circuit identification.

IV. Underground Warning Tape

A. Acid and alkali resistant .0035-inch thick polyethylene film.

B. 6 inches wide.

C. Tensile strength of 1750-PSI length wise, 1500-PSI cross-wide and an elongation of 350.

D. Bright yellow or red printed with 'CAUTION BUREID ELECTRIC LINE' over entire length in black lettering. Printing shall be overcoated to prevent fading.

CONSTRUCTION REQUIREMENTS

I. Nameplates

A. Install on all panelboards, main distribution switchgear, motor control centers, motor starters, disconnects, and equipment.

B. Attach nameplates to equipment using permanent adhesive, rivets, or screws. Exterior nameplate mounting shall not violate the weather resistance of the enclosure it is attached to.

II. Wire And Cable

A. Color-code all power wiring throughout the building.

B. Provide wire labels on all conductors in panels and junction boxes. Wire labeling shall follow nomenclature depicted in shop drawings and project record (as-built) drawings.

III. Raceway Identification System

A. Install identification during raceway system installation.

B. Labels shall be installed after color coding is applied.

IV. Overcurrent Devices

A. All overcurrent protection devices shall be identified as to the loads they serve.

1. Provide engraved plastic nameplates for each overcurrent device on main distribution switchgear.
2. Use panelboard directories to identify circuit breakers in branch circuit panelboards. Directories shall be machine generated – handwritten directories not allowed.

B. Provide label in inside cover of fusible disconnects indicating fuse size and type to be installed.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. GATE STRUCTURE – ELECTRICAL WORK as shown on the Electrical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

3. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

4. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. GATE STRUCTURE – ELECTRICAL WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

3. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

4. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION ELECTRICAL IDENTIFICATION SYSTEMS

ELECTRICAL SERVICES

GENERAL

I. Provision Includes:

A. New electric service for facility.

B Primary and Secondary service conduits as shown on drawings.

C. Concrete pad for Utility Company service transformer, constructed to Local Utility Company requirements.

D. Local Utility Company shall provide:

1. Primary service cables.
2. Service transformer.
3. Meter, meter base , and CT cabinet.
4. All terminations at padmount service transformer.

E. Local Utility Company shall furnish to Contractor the following equipment for installation:

1. Meter base.
2. CT cabinet.

II. System Description

A. Utility service shall consist of all materials required to bring electrical power from the Local Utility Company's distribution network to the Main Service Disconnect for the facility.

B. Service Characteristics:

1. Facility shall be supplied with a 120/240V, single phase, 3 wire service.

C. Local Utility Company contact information:

1. Commonwealth Edison.

III. References.

A. American National Standards Institute (ANSI):

1. ANSI C2 – National Electrical Safety Code.

B. National Fire Protection Association (NFPA):

1. NFPA 70 – National Electrical Code (NEC).

C. National Electrical Manufacturers Association (NEMA):

1. FB-1 – Conduit and Cable Assemblies.
2. OS-1 – Sheet Steel Outlet Boxes, Device Boxes, Covers and Box Supports.
3. TC-2 – Electrical Plastic Tubing and Conduit.
4. TC-3 – PVC Fittings for Use With Rigid PVC Conduit and Tubing.
5. WC-5 – Thermoplastic Insulated Wire and Cable
6. 250 – Enclosures for Electrical Equipment

D. Underwriters Laboratories, Inc. (UL):

1. All materials UL listed and labeled.

E. State of Illinois:

1. Illinois Steel Products Procurement Act, as amended.

MATERIAL REQUIREMENTS

I. Materials

A. See Basic Electrical Materials and Methods Special Provision for raceways, wire, boxes, and supports for services.

B. See Circuit and Motor Disconnects Special Provision for Main Service Disconnect.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Contractor shall thoroughly familiarize himself with existing conditions of the site prior to beginning work.

B. Local Utility Company shall be contacted prior to installing service entrance components for coordination:

1. Schedule for project shall be discussed to assure timely and proper power availability when and where needed for the project, including temporary construction power.
2. Routing requirements shall be verified.
3. Construction details for transformer pad and conduit installation shall be verified.

C. Main disconnect shall have an engraved label reading "Main Service Disconnect".

D. Underground Service:

1. Enclosed in a raceway as shown on drawings.
2. Metallic raceways shall be bonded to Main Service Disconnect Cabinet and ground electrode system.

3. Installation shall be watertight, including where conduits pass through walls or floors.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION ELECTRICAL SERVICES

EMERGENCY LIGHTING EQUIPMENT

GENERAL

I. Provision Includes:

A. Exit signs.

B. Emergency fluorescent lamp power supplies.

II. References:

A. American National Standards Institute (ANSI):

1. ANSI C62.41.

B. Federal Communications Commission (FCC)

C. National Electrical Manufacturers Association (NEMA):

1. NEMA WD-1 – General Purpose Wiring Devices
2. NEMA 250 – Enclosures

D. National Fire Protection Association (NFPA):

1. NFPA-70, National Electrical Code (NEC)
2. NFPA-101, Life Safety Code.

E. Underwriters Laboratory (UL):

1. All equipment UL listed or labeled.

F. State of Illinois:

1. Illinois Steel Products Procurement Act, as amended.

III. Submittals

A. Product Data:

1. Submit manufacturer's catalog cut sheets for all equipment. Submittal should clearly indicate number, dimensions, ratings, and all accessories and options to be provided.
2. Where cut sheets show more than one model, clearly indicate which model is to be provided.

B. Operating and Maintenance Manuals:

1. Submit manufacturers standard maintenance data for all equipment.

2. Data should include operating procedures, troubleshooting guide, recommended maintenance schedule, testing schedule, and complete spare parts list.

C. Warranties and Bonds:

1. Submit copies of manufacturer's standard warranties.

IV. Delivery, Storage And Handling

A. Materials shall be suitably packaged by manufacturer to prevent damage during shipment. Damaged materials will not be acceptable for use.

B. Store materials on site in clean, dry storage area. When outdoors, store elevated above grade and enclosed in durable watertight wrapping.

C. Store electronic components to avoid weather extremes. Do not exceed electronics' storage ratings for humidity and temperature.

D. Handle all materials carefully to prevent damage. Minor scratches, marks or blemishes to finish shall be repaired to satisfaction of the Architect/Engineer.

V. Project Conditions

A. Equipment shall be installed in locations and manner as shown on the Electrical Drawings.

B. When project conditions do not allow installation as indicated, contact the Architect/Engineer immediately. Do not proceed with the conflicting work until instructed by Architect/Engineer.

VI. Warranties And Bonds

A. Contractor's Warranty: One year in accordance with the General Conditions.

B. Manufacturer's Warranty: In accordance with the General Conditions:

1. Batteries: Three years non-prorated, ten years prorated.
2. Ballasts: Three years.
3. Chargers – Three (3) years unconditional.
4. All other equipment: One year.

MATERIAL REQUIREMENTS

I. Emergency Fluorescent Lamp Power Supplies

A. UL listed, capable of providing specified illumination levels for a minimum of 90 minutes.

B. Self-contained unit designed for mounting within a fluorescent fixture's ballast compartment.

1. Complete unit consisting of a battery, automatic charger, and inverter for powering the lamp.
2. Unit shall automatically transfer to battery power upon loss of AC power to unit.
3. Provided with brownout circuit to switch from AC power to battery if supply Voltage drops to less than 30% of nominal.

C. Operation:

1. Unit shall operate one F32T8 fluorescent lamp at full intensity during normal conditions.
2. Unit shall operate lamp at half intensity for a minimum of 90 minutes before reaching an end voltage of 80%.

D. Battery:

1. Sealed, rechargeable Nickel Cadmium type, with sufficient capacity of power connected lamp load for a minimum of 90 minutes before reaching an end voltage of 80%.
2. Provided with automatic controls to disconnect battery if voltage drops below 80%.

E. Charger:

1. Automatic dual-rate charger, capable of maintaining batteries in a fully charged state under normal conditions.
2. Capacity to fully recharge a discharged battery within 12 hours.

F. Equipped with the following:

1. Ready/Charging indicator lamp.
2. Test switch.

3. Indicating lamp and test switch to be mounted in separate enclosure adjacent to fixture.

G. Acceptable Manufacturers:

1. Bodine
2. Dual Light
3. Lithonia
4. Magnetek

II. Exit Signs

A. UL listed and meeting NFPA-101 minimum luminance levels.

B. Aluminum body with black painted finish.

C. Black painted Aluminum face with die-cut letters.

D. Universal mounting system convertible to wall or ceiling mount.

E. Red light emitting diode (LED) light source for both normal and emergency operation. LED's shall be behind a diffusing lens that evenly distributes light across entire stroke of letter.

D. Shall be single or dual face as noted on Drawings.

E. Shall be provided with removable knockout directional chevrons.

F. Battery:

1. Sealed, rechargeable Lead Calcium type, with sufficient capacity of power connected lamp load for a minimum of 90 minutes before reaching an end voltage of 80%.
2. Provided with automatic controls to disconnect battery if voltage drops below 80%.

G. Charger:

1. Automatic dual-rate charger, capable of maintaining batteries in a fully charged state under normal conditions.
2. With sufficient capacity to fully recharge a discharged battery within 12 hours.

H. Equipped with the following:

1. Ready/Charging indicator lamp
2. Test switch.

I. Acceptable Products: See Fixture Schedule on Drawings.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Mount all equipment per manufacturer's recommendations.

B. Secure surface mounted equipment using hardware suitable for mounting surface.

C. Install wall mounted units plumb and level.

1. Minimum mounting height shall be 7 feet AFF.
2. Maintain minimum 6 inch clearance above unit to ceiling.

D. Locate equipment clear of obstructions blocking sight.

E. Emergency fluorescent power supplies shall be installed at the factory.

1. Mount emergency fluorescent power supply unit remote test switch and indicator lamp adjacent to fixture.

F. Connect all emergency and exit lighting units to same circuit as general lighting for space.

II. Field Quality Control

A. All emergency lighting units shall be tested for proper operation by opening circuit breaker for the connected circuit. Units shall be operated in the emergency mode for the full 90 minute minimum required by NFPA-101.

B. Contractor shall replace all units or components that fail to operate as specified.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – ELECTRICAL WORK as shown on the Electrical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

3. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – ELECTRICAL WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

3. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION EMERGENCY LIGHTING EQUIPMENT

ENGINEER'S FIELD OFFICE, TYPE B

DESCRIPTION

I. Engineer's Field Office, Type B shall be in accordance with Section 670 of the Standard Specifications with the following exception:

A. The Department currently has a mobile office trailer on-site that shall serve as the Engineer's field office. The Contractor shall furnish and equip this existing mobile trailer with all of the requirements described in Section 670 of the Standard Specifications.

B. Removal of the trailer from the site according to Section 670 shall be included in this item.

BASIS OF PAYMENT

ENGINEER'S FIELD OFFICE, TYPE B will be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to furnish, equip, and maintain the field office for the duration of the project, and removal from the site when released by the Engineer.

END OF SPECIAL PROVISION – ENGINEER'S FIELD OFFICE, TYPE B

EROSION CONTROL SYSTEM

DESCRIPTION

I. This work shall consist of installing and maintaining an active erosion control system from the start of construction to the final establishment of turf. The erosion control system shall meet the requirements of the erosion control plans, construction procedures and special provisions, IDOT Standard Specifications, and the Stormwater Pollution Prevention Plan, provided as an attachment to this special provision. The Contractor shall submit all required notifications as required by the Stormwater Pollution Prevention Plan.

MATERIAL

I. Per the attached Stormwater Pollution Prevention Plan, and the erosion control plans, construction procedures and special provisions, and IDOT Standard Specifications.

CONSTRUCTION REQUIREMENTS

I. Per the attached Stormwater Pollution Prevention Plan, and the erosion control plans, construction procedures and special provisions, and IDOT Standard Specifications.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below.

EROSION CONTROL SYSTEM shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

EROSION CONTROL SYSTEM will be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to install and maintain the erosion control system in accordance with the Stormwater Pollution Prevention Plan , the erosion control plans and notes, construction procedures and special provisions and the IDOT Standard Specifications for the duration of the contract and the required plant establishment requirements.

END OF SPECIAL PROVISION – EROSION CONTROL SYSTEM

See the Storm Water Pollution Prevention Plan (SWPPP) along with the Contractor Certification Statement form for same and the SWPPP Erosion Control Inspection Report form below.

ILLINOIS DEPARTMENT OF NATURAL RESOURCES
Office of Water Resources

Storm Water Pollution Prevention Plan

Project	William G. Stratton Lock & Dam, Lock & Gate Structure Improvements		
City	McHenry, Illinois	Project No.	FR-435
County	McHenry	Year	2014

This plan has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10 (Permit ILR10), issued by the Illinois Environmental Protection Agency (IEPA) for storm water discharges from construction site activities.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Ted Montrey	
Print Name	Signature
Chief of Design Section	
Title	Date
Illinois Department of Natural Resources	
Agency	

I. Site Description:

A. Provide a description of the project location (include latitude and longitude):

The proposed Stratton Lock & Dam, Lock Gate & Gate Structure Improvements project is located at the Stratton Lock & Dam in the City of McHenry, Illinois on the Fox River. The latitude and longitude is approximately 42^0 18' 35.8"N, 88^0 15' 8.5"W based on www.findlatitudeandlongitude.com.

B. Provide a description of the construction activity which is the subject of this plan:

The work consists of constructing: an extension of the existing lock, existing lockhouse renovation, construction of a new flood control structure with hinged crest gates, construction of a new maintenance docking pier, demolition of the existing sluice gate structure, installation of remote gate operation controls at the Stratton lockhouse to control the flood control gates at Algonquin, IL, restoration of the upstream right bank berm, resurfacing the existing lock access road and parking lot, and all associated site work.

C. Provide the estimated duration of this project:

Approximately two and a half years.

D. The total area of the construction site is estimated to be 18.1 acres.

The total area of the site estimated to be disturbed by excavation, grading or other activities is 13.0 acres.

E. The following is a weighted average of the runoff coefficient for this project after construction activities are completed:

The Estimated runoff coefficient will be 0.14 and will effectively be unchanged from pre-construction activities.

F. List all soils found within project boundaries. Include map unit name, slope information, and erosivity:

791B, Rush silt loam, 2 to 4 percent slopes, 1067A, Harpster silt loam; 0 to 2 percent slopes, undrained; 802B, Orthents, loamy, undulating.

G. Provide an aerial extent of wetland acreage at the site:

Wetland exists along or near the south and west boundaries of the project and will be protected. It has been determined that construction on 1.44 acres occurrs within or along the waters of the Fox River below the OHWM. The USACE required 0.77 acres of this area to be mitigated. The impacts were mitigated by the purchase of 1.16 acres of wetland credits from the Jelkes Creek Wetland Bank

H. Provide a description of potentially erosive areas associated with this project:

Potentially erosive areas are located in the channel and on the side slopes just upstream and downstream of the new dam gate structure, just downstream of the new lock extension, along the toe of the north berm, and at the entrance to the new intake structure for the new lock extension.

I. The following is a description of soil disturbing activities by stages, their locations, and their erosive factors (e.g. steepness of slopes, length of slopes, etc):

This job will require: Tree removal and grubbing on the North berm; pavement removal and replacement, structure removal; excavation for, construction of, and backfilling of proposed structures; topsoil excavation, stockpiling, and placement; earth excavation; minimal fill placement and compaction; and excavation for and placement of riprap or slope paving.

J. See the erosion control plans and/or drainage plans for this contract for information regarding drainage patterns, approximate slopes anticipated before and after major grading activities, locations where vehicles enter or exit the site and controls to prevent offsite sediment tracking (to be added after contractor identifies locations), areas of soil disturbance, the location of major structural and non-structural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands) and locations where storm water is discharged to surface water including wetlands.

K. Identify who owns the drainage system (municipality or agency) this project will drain into:

The Illinois Department of Natural resources owns this property.

L. The following is a list of receiving water(s) and the ultimate receiving water(s) for this site. The location of the receiving waters can be found on the erosion and sediment control plans:

This project drains to wetlands to the south and west and the rest drains into the Fox River which runs through and along the east side of the project.

M. Describe areas of the site that are to be protected or remain undisturbed. These areas may include steep slopes, highly erodible soils, streams, stream buffers, specimen trees, natural vegetation, nature preserves, etc.

All construction activity is to be contained within the project working limits. The areas west of the north berm and access road and south of the southern working limits are wetlands. All wetlands shall be protected and shall not be disturbed. The Contractor shall at no time stage equipment or in any way disturb the wetlands. At the north berm, all work shall take place on the embankment. All erosion control shall be installed prior to the removal of any trees or vegetation. Tree trimming adjacent to the wetlands shall be controlled with no large limbs or debris impacting the wetlands. The west side slope of the north berm shall not be disturbed below elevation 738.5. All tree limbs and branches from trees located in the wetland that overhang the berm from a vertical line extended at the 738.5 ft. elevation shall be cut and removed. The contractor shall control the fall of the limbs to prevent them from damaging the wetland. The waters of the Fox River are also to be protected. No work is to begin until all applicable erosion/sediment control devises are in place that are associated with the work that is to be performed. This includes but is not limited to the installation of the turbidity curtain and the perimeter erosion barrier along the north berm prior to work on the berm, the installation of the turbidity curtain and closing of the gates

N. The following sensitive environmental resources are associated with this project, and may have the potential to be impacted by the proposed development:

☒ Floodplain
☒ Wetland Riparian

☐ Threatened and Endangered Species
☐ Historic Preservation
☒ 303(d) Listed receiving waters for suspended solids, turbidity, or siltation
☐ Receiving waters with Total Maximum Daily Load (TMDL) for sediment, total suspended solids, turbidity or siltation
☐ Applicable Federal, Tribal, State or Local Programs
☐ Other

1. 303(d) Listed receiving waters (fill out this section if checked above):

   a. The name(s) of the listed water body, and identification of all pollutants causing impairment:

      The water body is the Fox River. Based on IL_DT-23, located within one tenth of a mile upstream of the project site, the pollutants causing impairment are: alteration in stream-side or littoral vegetative covers, other flow regime alterations, cause unknown, aquatic algae and polychlorinated biphenyls. Based on a IL_DT-22 located within one tenth mile downstream of the site, pollutants causing impairment are: alteration in stream-side or littoral vegetative covers, chloride, copper, other flow regime alterations, sedimentation/siltation, aquatic algae, polychlorinated biphenyls and fecal coliform.

   b. Provide a description of how erosion and sediment control practices will prevent a discharge of sediment resulting from a storm event equal to or greater than a twenty-five (25) year, twenty-four (24) hour rainfall event:

      The cofferdams to be used during the construction of the lock extension and the gate structure are to be constructed to an elevation just above the 100 year frequency, thus preventing release of sediment from within those areas during a 25 year event. The turbidity curtain depth shall be 10% longer than the anticipate high water depth to insure the curtain rests on the bottom. Perimeter erosion barriers and other erosion control devises will be installed and maintained where needed and/or shown on the plans.

   c. Provide a description of the location(s) of direct discharge from the project site to the 303(d) water body:

      The only pipe discharging from the site is a 24" diameter discharge through the west sheet pile wall approximately 100 feet downstream of the end of the proposed lock extension. All other flows off of the site either flow into the river over the banks or into the wetlands.

   d. Provide a description of the location(s) of any dewatering discharges to the MS4 and/or water body:

      All dewatering is to be routed through filter bags and then discharged into the river. Discharges from within the gate structure cofferdams shall be onto the existing gate structure apron. Discharge from the lock structure cofferdam will be just downstream of the cofferdam. The discharge site shall be so located and/or protected such that no erosion occurs at the site.

2. TMDL (fill out this section if checked above)

   a. The name(s) of the listed water body:

      N/A

   b. Provide a description of the erosion and sediment control strategy that will be incorporated into the site design that is consistent with the assumptions and requirements of the TMDL:

      N/A

   c. If a specific numeric waste load allocation has been established that would apply to the project's discharges, provide a description of the necessary steps to meet that allocation:

      N/A

O. The following pollutants of concern will be associated with this construction project:

☒ Soil Sediment
☒ Concrete
☒ Concrete Truck Waste
☒ Concrete Curing Compounds
☒ Solid Waste Debris
☒ Paints
☒ Solvents
☒ Fertilizers / Pesticides
☒ Petroleum (gas, diesel, oil, kerosene, hydraulic oil / fluids)
☒ Antifreeze / Coolants
☒ Waste water from cleaning construction equipment
☐ Other (specify)
☐ Other (specify)
☐ Other (specify)
☐ Other (specify)
☐ Other (specify)

II. Controls:

This section of the plan addresses the controls that will be implemented for each of the major construction activities described in I.I. above and for all use areas, borrow sites, and waste sites. For each measure discussed, the Contractor will be responsible for its implementation as indicated. The Contractor shall provide to the Resident Engineer a plan for the implementation of the measures indicated. The Contractor, and subcontractors, will notify the Resident Engineer of any proposed changes, maintenance, or modifications to keep construction activities compliant with the Permit ILR10. Each such Contractor has signed the required certification on forms which are attached to, and are a part of, this plan:

A. **Erosion and Sediment Controls:** At a minimum, controls must be coordinated, installed and maintained to:

1. Minimize the amount of soil exposed during construction activity;
2. Minimize the disturbance of steep slopes;
3. Maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible;
4. Minimize soil compaction and, unless infeasible, preserve topsoil.

B. **Stabilization Practices:** Provided below is a description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized. Stabilization practices may include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Except as provided in II(B)a and II(B)b, stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 7 days after the construction activity in that portion of the site has temporarily or permanently ceased and on all disturbed portions of the site where construction activity will not occur for a period of 14 or more calendar days.

(a) Where the initiation of stabilization measures by the seventh day after construction activity temporarily or permanently ceases is precluded by snow cover, stabilization measures shall be initiated as soon as practicable thereafter.

(b) On areas where construction activity has temporarily ceased and will resume after fourteen (14) days, a temporary stabilization method can be used.

The following stabilization practices will be used for this project:

☒ Preservation of Mature Vegetation	☒ Erosion Control Blanket / Mulching
☐ Vegetated Buffer Strips	☐ Sodding
☒ Protection of Trees	☒ Geotextiles
☒ Temporary Erosion Control Seeding	☐ Other (specify)
☐ Temporary Turf (Seeding, Class 7)	☐ Other (specify)
☒ Temporary Mulching	☐ Other (specify)
☒ Permanent Seeding	☐ Other (specify)

Describe how the stabilization practices listed above will be utilized during construction:

Care shall be taken to not damage existing trees and vegetation to remain. Clearing and tree removal shall only be completed in the area/reach of the project that will immediately be worked on. Permanent seeding, mulching and fertilizing may be applied as soon as construction is completed in an area within allowable planting times. If permanent seeding has not been applied, Temporary Erosion Control Seeding shall be applied to all bare areas every seven days, regardless of weather conditions or progress of work. The Engineer may require that critical locations be seeded immediately and the Contractor shall seed these areas within 48 hours. When working on the north berm, no work apart from tree and shrub removal shall take place if the existing berm elevation exceeds elevation 742.50. The existing vegetation shall remain. No earth shall be borrowed from it. Temporary mulching may be used to stabilize bare areas when activities cease outside allowable planting dates.

Describe how the stabilization practices listed above will be utilized after construction activities have been completed:

Filter fabric will be placed as part of the riprap and shot rock placement activities to prevent the infiltration/loss of fines through the rock. All disturbed earth areas not protected by other measures will be protected with permanent seeding, mulching and fertilizing as shown in the contract plans, the Summary of Quantities or as directed by the Resident Engineer.

C. **Structural Practices:** Provided below is a description of structural practices that will be implemented, to the degree attainable, to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Such practices may include but are not limited to: perimeter erosion barrier, earth dikes, drainage swales, sediment traps, ditch checks, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. The installation of these devices may be subject to Section 404 of the Clean Water Act.

The following structural practices will be used for this project:

- ☒ Perimeter Erosion Barrier
- ☐ Temporary Ditch Check
- ☐ Storm Drain Inlet Protection
- ☒ Sediment Trap
- ☐ Temporary Pipe Slope Drain
- ☐ Temporary Sediment Basin
- ☐ Temporary Stream Crossing
- ☒ Stabilized Construction Exits
- ☐ Turf Reinforcement Mats
- ☐ Permanent Check Dams
- ☐ Permanent Sediment Basin
- ☐ Aggregate Ditch
- ☐ Paved Ditch
- ☐ Rock Outlet Protection
- ☒ Riprap/Shot Rock
- ☐ Gabions
- ☐ Slope Mattress
- ☒ Retaining Walls
- ☐ Slope Walls
- ☐ Concrete Revetment Mats
- ☐ Level Spreaders
- ☒ Other (specify) cofferdams
- ☒ Other (specify) silt turbidity curtain
- ☒ Other (specify) energy dissipator blocks
- ☒ Other (specify) energy dissipator pool
- ☒ Other (specify) aggregate surface

Describe how the structural practices listed above will be utilized during construction:

Prior to any construction activities, the Contractor shall install: perimeter erosion barrier and stabilized construction entrances/exits at locations shown in the plans or at locations approved by the Engineer to prevent sediment from discharging or being tracked outside the limits of the working area. The Contractor shall install turbidity curtains in accordance with the details and notes shown on the plans and specifications or as approved by the Engineer prior to performing any work that may result in sediment entering the river. During any dewatering operations, water shall be pumped from a sump pit constructed in accordance with NRCS Standard IL-650 and pumped into sediment filter bags prior to being discharged at a protected location. Prior to construction of the dam gate structure and the lock extension, cofferdams shall be constructed to the elevations shown in the plans. Water from inside the cofferdams shall be dewatered as specified above. Locations on the water side of the north berm that require fill and are below elevation 738.50, shall be covered with filter fabric and then filled with shot rock as shown on the plans. Where the rock fill meets earth fill, the Contractor shall keep the filter fabric between the two materials.

Describe how the structural practices listed above will be utilized after construction activities have been completed:

Permanent structural erosion control measures installed during construction of this project include: retaining walls at the lock and gate structures, energy dissipator blocks on the gate structure spillway apron, a riprap lined energy dissipator pool between the downstream end of the new gate structure spillway apron and the existing abandoned gate structure apron slab, aggregate base coarse type B gravel path and gravel drive at locations shown in the plans and stone riprap or shot rock at locations shown in the plans. All other structural practices will be removed at completion of construction.

D. **Treatment Chemicals**

Will polymer flocculants or treatment chemicals be utilized on this project? ☐ Yes ☒ No

If yes above, identify where and how polymer flocculants or treatment chemicals will be utilized on this project.

E. **Permanent Storm Water Management Controls:** Provided below is a description of measures that will be installed during the construction process to control volume and pollutants in storm water discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404 of the Clean Water Act.

1. Such practices may include but are not limited to: storm water detention structures (including wet ponds), storm water retention structures, flow attenuation by use of open vegetated swales and natural depressions, infiltration of runoff on site, and sequential systems (which combine several practices).

   The practices selected for implementation were determined on the basis of the technical guidance in Chapter 41 (Construction Site Storm Water Pollution Control) of the IDOT Bureau of Design and Environment Manual. If practices other than those discussed in Chapter 41 are selected for implementation or if practices are applied to situations different from those covered in Chapter 41, the technical basis for such decisions will be explained below.

2. Velocity dissipation devices will be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g. maintenance of hydrologic conditions such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

Description of permanent storm water management controls:

The new hinged crest (overflow) gates will not pull water from the bottom the way the existing sluice gates do, therefore they should cause less suspension of solids from upstream. The new dam gate structure will have energy dissipator blocks built into the apron as well as a riprap lined stilling basin followed by the existing gate slab to provide additional energy dissipation prior to flowing downstream.

F. **Approved State or Local Laws:** The management practices, controls and provisions contained in this plan will be in accordance with IDOT specifications, which are at least as protective as the requirements contained in the Illinois Environmental Protection Agency's Illinois Urban Manual. Procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials shall be described or incorporated by reference in the space provided below. Requirements specified in sediment and erosion site plans, site permits, storm water management site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI, to be authorized to discharge under the Permit ILR10 incorporated by reference and are enforceable under this permit even if they are not specifically included in the plan.

Description of procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials:

The Illinois Department of Natural Resources, The U.S. Army Corp of Engineers, the Illinois Environmental Protection Agency and the McHenry-Lake County Soil & Water Conservation District have all issued permits and/or special conditions that will be required to be met on this project. These permits/conditions particularly address requirements that need to be met for working in or discharging into the water. These permits/special conditions are included in the construction specifications booklet for the project.

G. **Contractor Required Submittals:** Prior to conducting any professional services at the site covered by this plan, the Contractor and each subcontractor responsible for compliance with the permit shall submit to the Resident Engineer a Contractor Certification Statement, BDE 2342a.

1. The Contractor shall provide a construction schedule containing an adequate level of detail to show major activities with implementation of pollution prevention BMPs, including the following items:

   - Approximate duration of the project, including each stage of the project
   - Rainy season, dry season, and winter shutdown dates
   - Temporary stabilization measures to be employed by contract phases
   - Mobilization timeframe
   - Mass clearing and grubbing/roadside clearing dates
   - Deployment of Erosion Control Practices
   - Deployment of Sediment Control Practices (including stabilized construction entrances/exits)

- Deployment of Construction Site Management Practices (including concrete washout facilities, chemical storage, refueling locations, etc.)
- Paving, saw-cutting, and any other pavement related operations
- Major planned stockpiling operations
- Timeframe for other significant long-term operations or activities that may plan non-storm water discharges such as dewatering, grinding, etc.
- Permanent stabilization activities for each area of the project

2. The Contractor and each subcontractor shall provide, as an attachment to their signed Contractor Certification Statement, a discussion of how they will comply with the requirements of the permit in regard to the following items and provide a graphical representation showing location and type of BMPs to be used when applicable:

- Vehicle Entrances and Exits – Identify type and location of stabilized construction entrances and exits to be used and how they will be maintained.
- Material Delivery, Storage and Use – Discuss where and how materials including chemicals, concrete curing compounds, petroleum products, etc. will be stored for this project.
- Stockpile Management – Identify the location of both on-site and off-site stockpiles. Discuss what BMPs will be used to prevent pollution of storm water from stockpiles.
- Waste Disposal – Discuss methods of waste disposal that will be used for this project.
- Spill Prevention and Control – Discuss steps that will be taken in the event of a material spill (chemicals, concrete curing compounds, petroleum, etc.)
- Concrete Residuals and Washout Wastes – Discuss the location and type of concrete washout facilities to be used on this project and how they will be signed and maintained.
- Litter Management – Discuss how litter will be maintained for this project (education of employees, number of dumpsters, frequency of dumpster pick-up, etc.).
- Vehicle and Equipment Fueling – Identify equipment fueling locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Vehicle and Equipment Cleaning and Maintenance – Identify where equipment cleaning and maintenance locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Dewatering activities – Identify the controls which will be used during dewatering operations to ensure sediments will not leave the construction site.
- Polymer flocculants and treatment chemicals – Identify the use and dosage of treatment chemicals and provide the Resident Engineer with Material Safety Data Sheets. Describe procedures on how the chemicals will be used and identify who will be responsible for the use and application of these chemicals. The selected individual must be trained on the established procedures.
- Additional measures indicated in the plan.

III. Maintenance:

When requested by the Contractor, the Resident Engineer will provide general maintenance guides to the Contractor for the practices associated with this project. The following additional procedures will be used to maintain, in good and effective operating conditions, the vegetation, erosion and sediment control measures and other protective measures identified in this plan. It will be the Contractor's responsibility to attain maintenance guidelines for any manufactured BMPs which are to be installed and maintained per manufacture's specifications.

1 Stabilized construction entrance: The entrance shall be maintained to prevent tracking of sediment onto public streets. This will be done by top dressing with additional stones, remove and replace top layer of stones or washing the entrance. The sediment washed on the public right-of-way will be removed immediately.

2 Vegetative erosion control measures: The vegetative growth of temporary and permanent seeding, vegetative filter, etc, shall be maintained periodically and supply adequate watering and fertilizer.

3 Silt filter fence: The damaged silt filter fence shall be restored to meet the standards or removed and replaced as needed.

4 Rip-rap protection: It shall be inspected after high flows for any scour beneath the rip-rap or for stones that have been dislodged. It shall be repaired immediately.

5. Sediment Filter Bag. The sediment filter bag shall be replaced when the contained silt reduces the bags flow to

approximately 50% of the rate of initial discharge or when directed by the inspector-in-charge or Engineer.

6. Floating Turbidity Curtain. The curtain shall be maintained in Accordance with Code 917 of the Illinois Urban Manual.

IV. Inspections:

Qualified personnel shall inspect disturbed areas of the construction site which have not yet been finally stabilized, structural control measures, and locations where vehicles and equipment enter and exit the site using IDOT Storm Water Pollution Prevention Plan Erosion Control Inspection Report (BC 2259). Such inspections shall be conducted at least once every seven (7) calendar days and within twenty-four (24) hours of the end of a storm or by the end of the following business or work day that is 0.5 inch or greater or equivalent snowfall.

1. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the plan shall be observed to ensure that they are operating correctly. Where discharge locations to points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking.

2. Based on the results of the inspection, the description of potential pollutant sources identified in the Site Description section above and pollution prevention measures identified in the Controls section above shall be revised as appropriate as soon as practicable after such inspection. Any changes to this plan resulting from the required inspections shall be implemented within 7 calendar days following the inspection.

3. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of this storm water pollution prevention plan, and actions taken in accordance with section b. above shall be made and retained as part of the plan for at least three (3) years after the date of the inspection. The report shall be signed in accordance with Part VI. G of the Permit ILR10.

4. Inspections may be reduced to once per month when construction activities have ceased due to frozen conditions. Weekly inspections will recommence when construction activities are conducted, or if there is 0.5" or greater rain event, or a discharge due to snowmelt occurs.

If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer shall notify the appropriate IEPA Field Operations Section office by email at: epa.swnoncomp@illinois.gov, telephone or fax within twenty-four (24) hours of the incident. The Resident Engineer shall then complete and submit an "Incidence of Non-Compliance" (ION) report for the identified violation within five (5) days of the incident. The Resident Engineer shall use forms provided by IEPA and shall include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. All reports of non-compliance shall be signed by a responsible authority in accordance with Part VI. G of the Permit ILR10.

The Incidence of Non-Compliance shall be mailed to the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Attn: Compliance Assurance Section
1021 North Grand East
Post Office Box 19276
Springfield, Illinois 62794-9276

V. Failure to Comply:

Failure to comply with any provisions of this Storm Water Pollution Prevention Plan will result in the implementation of a National Pollutant Discharge Elimination System/Erosion and Sediment Control Deficiency Deduction against the Contractor and/or penalties under the Permit ILR10 which could be passed on to the Contractor.

ILLINOIS
DEPARTMENT OF
NATURAL RESOURCES
Office of Water Resources

Contractor Certification Statement

Prior to conducting any professional services at the site covered by this contract, the Contractor and every subcontractor must complete and return to the Resident Engineer the following certification. A separate certification must be submitted by each firm. Attach to this certification all items required by Section II.5 of the Storm Water Pollution Prevention Plan (SWPPP) which will be handled by the Contractor/subcontractor completing this form.

Project: William G. Stratton Lock & Dam, Lock & Gate Structure Improvements

City: McHenry, Illinois — Project No.: FR-435

County: McHenry — Year: 2014

This certification statement is a part of the SWPPP for the project described above, in accordance with the General NPDES Permit No. ILR10 issued by the Illinois Environmental Protection Agency.

I certify under penalty of law that I understand the terms of the Permit No. ILR 10 that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

In addition, I have read and understand all of the information and requirements stated in the SWPPP for the above mentioned project; I have received copies of all appropriate maintenance procedures; and, I have provided all documentation required to be in compliance with the Permit ILR10 and SWPPP and will provide timely updates to these documents as necessary.

☐ Contractor

☐ Sub-Contractor

Print Name	Signature
Title	Date
Name of Firm	Telephone
Street Address	City/State/ZIP

Items which this Contractor/subcontractor will be responsible for as required in Section II.5. of the SWPPP:

Illinois Department of Transportation

Storm Water Pollution Prevention Plan
Erosion Control Inspection Report

Date of Inspection: _____ County: McHenry

Name of Inspector: _____ Section: _____

Type of Inspection: Weekly ☐ Route: _____

>0.5" Precip. ☐ Precip. Amt: _____ " District: 1

Contractor: _____ Contract No: _____

Subs: _____ Job No. FR-435

_____ Project: Stratton Lock & Dam, Lock & Gate Str. Imp.

NPDES/ESC Deficiency Deduction: $ _____ NPDES Permit No: _____

Total Disturbed Area: _____ acre Ready for Final Cover: _____ acre

Final Cover Established: _____ acre

Erosion and Sediment Control Practices

Item # / BMP			YES	NO	N/A
1.	**Slopes:**	Do all slopes and exposed areas where soil disturbing activities have temporarily or permanently ceased, and not permanently stabilized, have adequate temporary seed or other stabilization in accordance with the NPDES permitted 7 and 14 day rule?	☐	☐	☐
2.	**Ditches**	Are all ditches (existing and temporary) clear of sediment and/or debris?	☐	☐	☐
		Do all ditches have adequate stabilization and structural practices in place?	☐	☐	☐
3.	**Perimeter Erosion Barrier:**	Are all perimeter erosion barriers in good working order?	☐	☐	☐
		Has perimeter barrier no longer needed been removed and the area stabilized?	☐	☐	☐
4.	**Temporary Ditch Checks:**	Are all temporary ditch checks in good working order?	☐	☐	☐
		Are the current ditch checks adequate to control erosion?	☐	☐	☐
5.	**Temp Diversions/ Slope Drains:**	Are all Temporary Diversions and Slope Drains functioning properly?	☐	☐	☐
6.	**Inlet Protection:**	Are ALL inlet protection devices in good working order?	☐	☐	☐
		Are ALL inlet filters less than 25% full and fabric unobstructed?	☐	☐	☐
7.	**Sediment Basins/Traps:**	Are ALL sediment basins/traps in good working order?	☐	☐	☐
		Does sufficient capacity exist for the design stormwater event?	☐	☐	☐
8.	**Areas of Interest – Wetland/Prairie/Tree Preservation:**				
		Has the contractor remained clear of all designated "no entry" areas?	☐	☐	☐
		Are all "no intrusion" areas adequately marked to prevent accidental entry?	☐	☐	☐
9.	**Stock Piles:**	Are all stockpiles properly situated and maintained to prevent runoff and protected to minimize discharge of materials or residue in case of erosion?	☐	☐	☐
10.	**Borrow/Waste Sites:**	Are all borrow and waste locations, including those located offsite, in compliance with NPDES requirements?	☐	☐	☐
11.	**Other Installations:**	Are all other BMP installations shown in the plans properly functioning? (note in comments)	☐	☐	☐

General Site Maintenance Required of the Permit

12.	**Vehicle Tracking:**	Is the site free from mud, sediment and debris from the vehicles entering/leaving off road areas throughout the site?	☐	☐	☐
		Are Stabilized Construction field entrances properly located?	☐	☐	☐
		Are Stabilized Construction field entrances in good working condition?	☐	☐	☐

Item # / BMP			YES	NO	N/A
13.	**Concrete Washout Areas:**	Are concrete washout areas adequately signed and maintained?	☐	☐	☐
		Has all washout occurred only at designated washout locations?	☐	☐	☐
14.	**Staging/Storage Areas:**	Are all staging/storage facilities free of litter, leaking containers, leaking equipment, spills, etc?	☐	☐	☐
15.	**Fuel/Chemical Storage:**	Are all fuels and chemicals stored only in designated locations?	☐	☐	☐
		Are all designated locations free of evidence of leaks and or spills?	☐	☐	☐
16.	**Previous Inspection Follow Up:**	Have all corrections from the last report been properly completed?	☐	☐	☐
		If not, has a NPDES/ESC Deficiency Deduction been assessed?	☐	☐	☐
17.	**Update SWPPP:**	Have all changes to the projects SWPPP been noted on the graphic site plan, signed and dated?	☐	☐	☐
18.	**Off-site Dischare of Sediment:**	Has sediment or other pollutants of concern been released from the project site?	☐	☐	☐
		If Yes, has the Illinois Environmental Protection Agency been notified within 24 hours of your observation of the discharge and an Incidence of Non-Compliance (ION) mailed within 5 days?	☐	☐	☐

Specific Instructions Related to "No" Answers From Above:

Item #	Station or Station to Station	Practice	Comments/Actions Required	Time for Repair

Other Comments:

Additional Pages (Attached As Needed)

☐ Outfalls / Receiving Waters
☐ Drainage Structure/Ditch Check Locations
☐ Additional Instructions to Contractor

Other: _____

If the answer to any of Items 1-16 above is "No", the contractor is hereby ordered to correct the deficiency. Repairs and stabilization are to be completed within 24 hours of this report (or as indicated above) or the DAILY NPDES/ESC Deficiency Deduction will be assessed for each noted deficiency until the required action is completed.

Inspector's Signature _____ Date/Time: _____

Contractor's Signature _____ Date/Time: _____

Original: Project File
cc: Contractor

EXTERIOR PAINTING

GENERAL

This Section includes surface preparation and the application of paint systems on the following exterior substrates:

A. Lock House and Gate Structure Hollow Metal Doors and Frames.

B. Structural Steel – Machine Bridge

C. Structural Steel – Access Walkway

D. Structural Steel- Bulkhead Gates

E. Structural Steel – Lock Miter Gates

F. Existing Steel Sheet Piling

G. New Steel Sheet Piling

H. Wood Surfaces – Lockhouse Soffit And Trim.

I. Bumper Timbers at Lock.

I. REFERENCES

A. ANSI/ASTM D16 – Definition of Terms Related to Paint, Varnish, Lacquer, and Related Products.

II. DEFINITIONS

A. Conform to ANSI/ASTM D16 for interpretation of terms used in this Section.

III. REGULATORY REQUIREMENTS

A. Conform to applicable code for flame/fuel/smoke rating requirements for finishes.

B. All coatings, thinners, etc. shall be lead and chromate free, and VOC compliant. Volatile organic compounds per gallon of coating shall be limited to less than 3.5 lbs. per gallon (preferably less than 2.8 lbs. per gallon) in the coating's thinned, ready to apply state.

C. Zinc Dust Powder shall be ASTM D520, Type II Zinc Version.

IV. QUALITY ASSURANCE

A. Product Manufacturer: Company specializing in manufacturing quality paints and finish products with ten (10) years' experience.

B. Applicator: Company specializing in industrial painting and finishing with five (5) years documented experience.

V. SUBMITTALS

A. Product Data: For each type of product indicated.

B. Manufacturer's application instructions for each type of product indicated.

C. Samples for Initial Selection: For each type of topcoat product indicated.

D. Samples for Verification: For each type of paint system and each color and gloss of topcoat indicated:

1. Submit Samples on rigid backing, 8 in. square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

E. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

VI. QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

B. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:

1. Engineer will select one (1) surface to represent surfaces and conditions for application of each paint system specified in Part 3:

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
b. Other Items: Engineer will designate items or areas required.

2. Final approval of color selections will be based on benchmark samples:

a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Engineer at no added cost to Department.

VII. DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in a timely manner to avoid delays in construction.

B. Store and protect products from weather, extremes in temperatures, and direct sun.

C. Paint materials shall be received in sealed original labeled containers, bearing manufacturer's name, type of paint, brand name, color designation and instructions for mixing and/or reducing.

D. Store paint materials at minimum ambient temperature of 45°F and a maximum of 90°F, in well ventilated area, unless required otherwise by manufacturer's instructions.

E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

VIII. PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95°F.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 50 percent; at temperatures less than 5°F above the dew point; or to damp or wet surfaces unless required otherwise by the manufacturer's instructions.

C. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above 50°F for twenty-four (24) hours before, during and forty-eight (48) hours after application of finishes, unless required otherwise by manufacturer's instructions.

D. Provide minimum 80 ft candles of lighting on surfaces to be finished.

IX. 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:

1. Quantity: Furnish an additional 1 gal. of each material and color applied.

X. WARRANTY

A. The Contractor shall warrant his work to be free from all defects in material and workmanship for a period of one (1) year from the date of written acceptance by the Engineer for the Sheet Piling, Lock Miter Gates, Bulkhead Gates, Machine Bridge, and Access Walkway.

B. The Contractor shall warrant his work to be free from all defects in material and workmanship for a period of five (5) years from the date of written acceptance by the Engineer for all remaining painted surfaces.

C. The warranty shall cover the prepared existing coatings and new coatings, i.e., from the steel substrate out. The warranty shall be based on zero percent (O%) failure rate. Warranties based on percentage failure per year, or which are prorated or conditional warranties shall be deemed unacceptable.

D. As a portion of the Contract covering the work of this specification, the Contractor shall be responsible for correction of all coatings defects and failures. All repairs shall be scheduled and completed within four (4) months of written Contractor notification of required repairs.

E. All required repairs shall be in accordance with the provisions of the original coatings work.

MATERIAL REQUIEMENTS

I. MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1. Benjamin Moore & Co.
2. ICI Paints.
3. Kelly-Moore Paints.
4. Pratt and Lambert.
5. PPG Architectural Finishes, Inc.
6. Sherwin-Williams Company (The).
7. TNEMEC
8. Carboline Coatings

II. 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.
2. 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. Colors: As selected by the Engineer from manufacturer's full range.

III. DOORS AND FRAMES

A. Alkyd Anticorrosive Metal Primer: MPI #79.

B. Exterior Latex (Semigloss): MPI #11 (Gloss Level 5):

1. VOC Content: E Range of E3.

IV. EXTERIOR WOOD SURFACES AND BUMPER TIMBERS

A. Exterior Latex Wood Primer: S-W Exterior Latex Wood Primer, B42W8041

B. Exterior Latex (Semigloss): MPI #11 (Gloss Level 5):

1. VOC Content: E Range of E3.

V. STEEL SHEET PILING

A. Primer

1. TNEMEC Series 94-H2O
2. Carbozinc 859

B. Top Coat

1. TNEMEC: Pota-Pox Plus; Series N140
2. Carboline: Carboguard 690 GF

VI. LOCK MITER GATES AND BULKHEAD GATES

A. Self-priming Coat:

1. Carboline: Reactamine 760

B. Top Coat:

1. Carboline: Carbothane 133 LH

VII. MACHINE BRIDGE AND ACCESS WALKWAY

A. Shop Coating:

1. Prime Coat – Carbozinc 859
2. First Coat – Carboguard 893 SG
3. Finish Coat – Carbothane 134 HG

B. Field Touch Up:

1. Prime Coat – Carboguard 893 SG
2. First Coat – Carboguard 893 SG
3. Finish Coat – Carbothane 134 HG

CONSTRUCTION REQUIREMENT

I. EXAMINATION

A. Thoroughly examine surfaces scheduled to be painted prior to commencement of work. Report in writing to Engineer, any condition that may potentially affect proper application.

B. Correct defects and deficiencies in surfaces which may adversely affect work of this Section.

C. Shop finish new structural steel, except around field weld connections.

D. Upon delivery of steel to the site, all surfaces shall be free of defects. Surfaces shall be inspected by the Construction Supervisor upon receipt and unloading. If defects are found, the Construction Supervisor shall determine the extent of the touch-up work that will be done at the Contractor's expense.

E. For field touch-up work, the Contractor shall notify the Construction Supervisor and allow him to inspect surfaces after cleaning and before primer or paint is applied.

F. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry:

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

II. 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:

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any
2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

C. Clean substrates of substances that could impair bond of paints:

1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.
2. Remove grease, rust, scale, dirt, and dust from steel and iron surfaces. Remove oil and grease with solvents, in compliance with SSPC-SP1-82, Solvent Cleaning. Prepare surfaces to be field painted to a hand or power tool cleaning in accordance with SSPC-SP-2 or 3. Feather edges to make touch-up patches inconspicuous. Ensure steel surfaces are at the specified preparation level immediately prior to paint application.
3. Mask-off or shield all mill finish aluminum or items not to be painted

D. Preparation for Sheet Piling, Lock Miter Gates, and Bulkhead Gates

1. The existing steel sheet pile and lock miter gate coatings may contain lead paint. Painting work shall conform to the provisions for CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES.
2. Prior to surface preparation for coating, visible deposits of oil or grease shall be removed in accordance with SSPC-SP-1 or other methods approved by the Engineer.
3. Prior to abrasive blast cleaning, surface imperfections such as sharp fins, sharp edges, weld spatter, or burning slag shall be removed from the surface. Sharp

corners and edges shall be ground to a smooth round edge with a radius of not less than 1/16 inch.

4. Abrasive blast cleaned surfaces shall meet the requirements of this specification when examined in accordance with Society for Protective Coatings "Guide to SSPC-VIS 1-89". This applies to all exposed surfaces, including difficult to access areas. When a structure is to be rehabilitated and the coatings to be removed contain lead, acceptable coating removal methods include wet abrasive blast cleaning, water jetting with or without abrasives, vacuum abrasive blast cleaning, and chemical stripping. Certain coating removal methods require subsequent dry abrasive blasting to achieve the specified surface preparation. Should these methods be selected, the Contractor shall ensure that no fugitive dust escapes the containment system during dry abrasive blasting. This is to be accomplished by the use of negative air and/or dust collection systems adequately sized to effectively control dust.
5. For rehabilitation of existing steel: Moderately Pitted Surfaces - A moderately pitted surface is defined as a surface having pits less than 1/16 inch deep with a frequency of 4 to 5 pits per square foot. Prior to application of the specified coating system, the pitted surface shall be blasted to SSPC-SP10. The first coat may be thinned (not to exceed manufacturer's published recommendations) and applied by stiff bristle brush or roller to all pitted surfaces.
6. For rehabilitation of existing steel: Badly Pitted Surfaces - A badly pitted surface is defined as a surface having pits greater than 1/16 inch deep and less than 1/2 of the metal thickness with a frequency of 8-12 pits per square foot. Prior to application of the specified system, the pitted surface shall be blasted to SSPC-SP10. Prior to applying the specified system, the pits shall be filled with an epoxy caulk seam sealer applied by putty knife or stiff bristle brush.
7. Prior to painting, all prepared surfaces to be coated must have dust removed by vacuuming.
8. Subsequent to achieving the specified surface preparation and prior to coating application, wetted surfaces must be confirmed free from surface contaminants, visible and non-visible, to a level of less than 7μg/cm2 as sodium chloride. Contractor is to insure the surface is dust free at the time of the test and that the surfaces to be tested are clean.
9. Prepared exterior surfaces may be vacuumed or cleaned by an alternative method acceptable to the Engineer.

III. APPLICATION

A. Do not apply finishes to surfaces that are not dry.

B. Apply each coat to uniform finish.

C. Apply paints according to manufacturer's written instructions:

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.

D. 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.

E. Contractor shall notify The Engineer one day prior to applying the primer and each coat of paint. The Engineer shall have the Construction Supervisor and/or a Technical representative from the painting manufacture inspect the application of each coat of paint.

F. If items are factory primed/painted, The Engineer shall be notified one week prior to the coating to allow for inspection of the surface preparation and subsequent painting.

G. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

H. Sand down and repaint sags and other deficiencies.

I. Strictly observe materials stated pot life. Discard mixed materials beyond their pot life.

J. 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.

IV. CLEANING AND PROTECTION

A. As work proceeds, promptly remove paint where spilled, splashed, or spattered.

B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.

C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

D. All project generated wastes/debris shall be, and remain unmixed and separate.

E. Blast and coating residue shall be removed from the enclosure to the appropriate waste storage containers on a daily basis unless otherwise directed by the Construction Supervisor.

F. Provide prompt removal and proper disposal of all Contractor generated debris and trash as required; maximum weekly interval.

G. Remove all tools, surplus materials, equipment, scrap, debris and waste from the plant site immediately upon completion of the project.

H. Blast wastes may remain on site until proper waste classifications is determined. Blast/paint residue shall be removed within one week of the receipt of analytical data.

I. Contractor generated solvent wastes and coatings application waste is the sole responsibility of the Contractor. All such wastes shall be managed by the Contractor in accordance with the appendix.

J. Correct and restore to original condition any property and equipment damaged as a result of project operations.

K. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.

L. Protect elements surrounding the work of this Section from damage or disfiguration.

V. PAINTING SCHEDULE

A. Shop painting :

AREAS & ITEMS TO BE PAINTED	PRIME COAT	FIRST COAT	FINISH COAT	COLOR
All new structural steel, including miscellaneous plates, angles, etc. NOTE: All back-to-back angles shall be blasted and primed prior to fabrication and full primer application.	3-5 mils DFT	4-5 mils DFT	3-6 mils DFT	Gray
Steel Sheet Piling	Mfg. Std.	Mfg. Std.	Mfg. Std.	Gray
Bulkhead Gates	Mfg. Std. Reactamine 760 (60-80 mils DFT)		Mfg. Std. Carbothane 133 LH (3-5 mils DFT)	Gray
Doors and Frames	Mfg. Std.			Mfg. Std.
Lock Bumper Timbers	4 mils DFT	4 mils DFT	4 mils DFT	White/Red

B. Field Touch Up and Field Painting:

AREAS & ITEMS TO BE PAINTED	PRIME COAT	FIRST COAT	FINISH COAT	COLOR
Touch-up for field welded connections and other damaged areas	5 mils DFT	5 mils DFT	3 mils DFT	Match colors as applicable.
Existing Sheet Piling	Mfg. Std.	Mfg. Std.	Mfg. Std.	Gray
Existing Miter Gates	Mfg. Std. Reactamine 760 (60-80 mils DFT)		Mfg. Std. Carbothane 133 LH (3-5 mils DFT)	Gray
Miscellaneous Wood Surfaces	4 mils DFT	4 mils DFT	4 mils DFT	TBD
Wood Fascia and Exposed Roof Deck	4 mils DFT	4 mils DFT	4 mils DFT	Match Window Trim
Doors and Frames		4 mils DFT	4 mils DFT	TBD

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items listed below:

LOCKHOUSE – PAINTING shall be measured for payment as a single lump sum item.

GATE STRUCTURE – PAINTING shall be measured for payment as a single lump sum item.

CLEANING AND PAINTING EXISTING STEEL SHEET PILING shall be measured for payment as a single lump sum item. This item includes prime and finish coat(s) for sheet pile accessories attached including, but not limited to: steel channel caps; clip angles; ladder rungs; tie-rod ends, nuts and washers; and mooring bits

CLEANING AND PAINTING EXISTING MITER GATE STEEL shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

LOCKHOUSE – PAINTING shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to paint exterior lockhouse doors, frames, wood soffit, and wood trim as shown on the plans.

GATE STRUCTURE – PAINTING shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to paint gate structure doors and frames, machine bridge structural steel, access walkway structural steel, and bulkhead gate structural steel as shown on the plans.

CLEANING AND PAINTING EXISTING STEEL SHEET PILING shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to clean and paint steel sheet piling in the existing lock chamber as shown on the plans.

CLEANING AND PAINTING EXISTING MITER GATE STEEL shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to clean and paint the existing lock miter gates as shown on the plans.

Painting new steel sheet piling will not be paid for separately, but shall be included in the contract unit price for PERMANENT STEEL SHEET PILING. This includes prime and finish coat(s) for sheet pile accessories attached including, but not limited to: steel channel and bent plate caps; clip angles; ladder rungs; tie-rod ends, nuts and washers; and mooring bits

Painting bumper timbers will not be paid for separately, but shall be included in the contract unit price for TREATED TIMBER.

Containment and disposal of lead paint residues for the existing sheet piling and steel chamber wall features shall conform to the provisions for CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES and be paid for at the contract lump sum price for CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES NO. 1. This shall include, but is not limited to, soil, water, and air monitoring, containment, collection, temporary storage, transportation, and testing and disposal of all project waste.

Containment and disposal of lead paint residues for the existing lock miter gates shall conform to the provisions for CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES and be paid for at the contract lump sum price for CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES NO. 2. This shall include, but is not limited to, soil, water, and air monitoring, containment, collection, temporary storage, transportation, and testing and disposal of all project waste.

END OF SPECIAL PROVISION – EXTERIOR PAINTING

FENCE REMOVAL

DESCRIPTION

I. This work shall consist of the removal of both chain link and rustic split rail fencing where indicated on the plans. The man-gates, vehicle gates and walk-around prevention panels shall be salvaged and reused. The rustic split rail fence shall be removed **and disposed**. All salvaged material shall be stockpiled in a secure location.

MATERIAL

I. Not Applicable

CONSTRUCTION REQUIREMENTS

I. Rustic Split Rail Fence

A. The posts shall be pulled and removed in their entirety.

B. If a post breaks off during removal, the remaining portion shall be dug out and removed.

C. The rails and posts shall be removed and disposed of by the Contractor in a legal manner.

D. All post holes shall be filled with native soil and compacted in 6-in lifts.

II. Chain Link Fence

A. Work shall not commence until the Contractor has secured the site.

B. The chain link fence shall be carefully disassembled in the areas identified on the plans.

C. At locations where the fence removal stops, the remaining fence shall be braced and stabilized to maintain the fence's integrity.

D. The Contractor shall remove the fence posts in their entirety including any concrete that was poured around the post.

E. Man-gates, vehicle gates and the walk around prevention panels shall be salvaged and stored securely onsite for reinstallation.

F. All holes left from the removal of the fence shall be filled with native material and compacted in 6-in lifts.

G. All removed fence material not being reused shall be disposed of by the Contractor in a legal manner.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

FENCE REMOVAL shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

FENCE REMOVAL will be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to remove and properly dispose of the existing fence and other items incidental to removing the fence as shown on the plans.

END OF SPECIAL PROVISION – FENCE REMOVAL

FIRE EXTINGUISHERS

GENERAL

I. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers for the Lockhouse and the Gate Structure.

II. 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.

B. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

C. Warranty: Sample of special warranty.

III. 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:

1. Provide fire extinguishers approved, listed, and labeled by FMG.

IV. 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:

1. Failures include, but are not limited to, the following:

a. Failure of hydrostatic test according to NFPA 10.
b. Faulty operation of valves or release levers.

2. Warranty Period: Six (6) years from date of Substantial Completion.

MATERIAL REQUIREMENTS

I. PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each mounting bracket indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Amerex Corporation.

b. J. L. Industries, Inc.; a division of Activar Construction Products Group.
c. Larsen's Manufacturing Company.
d. Potter Roemer LLC.

2. Valves: Manufacturer's standard.
3. Handles and Levers: Manufacturer's standard.
4. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B.

B. Multipurpose Dry-Chemical Type in Steel Container FE-1: UL-rated 3-A:40-B:C, 5-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

II. MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or black baked-enamel finish:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Amerex Corporation.
b. J. L. Industries, Inc.; a division of Activar Construction Products Group.
c. Larsen's Manufacturing Company.
d. Potter Roemer LLC.

B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Engineer:

1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface:

a. Orientation: Vertical.

CONSTRUCTION REQUIREMENTS

I. EXAMINATION

A. Examine fire extinguishers for proper charging and tagging:

1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

II. INSTALLATION

A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction:

1. Mounting Brackets: 54 in. above finished floor to top of fire extinguisher.

B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

GATE STRUCTURE – FIRE EXTINGUISHERS shall be measured for payment as a single lump sum item.

LOCKHOUSE – FIRE EXTINGUISHERS shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

GATE STRUCTURE – FIRE EXTINGUISHERS shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to supply and install fire extinguishers and other items incidental to the installation as shown on the plans.

LOCKHOUSE – FIRE EXTINGUISHERS shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to supply and install fire extinguishers and other items incidental to the installation as shown on the plans.

END OF SPECIAL PROVISION – FIRE EXTINGUISHERS

FIXED ACCESS LADDER

DESCRIPTION

This work shall consist of fabrication, delivery and installation of the fixed access ladder with ladder safety post as shown on the Plans

MATERIAL

I. FIXED ACCESS LADDERS

A. Provide prefabricated, fixed steel ladder for the height indicated on the plans with walk-trough handrails.

1. Ladder design shall meet or exceed requirements of ANSI A14.3, OSHA 1910.27, and OSHA 1926.1053 standards.
2. Finish: Galvanized
3. Products: Subject to compliance with requirements, available products that may be incorporated into the work include, but are not limited, the following:

a. FS Industries, Series F
b. Calico Ladders, FGW Model
c. Cotterman Company, Series FW

II. LADDER SAFETY POST

A. The ladder safety post shall be pre-assembled from the manufacturer.

B. Performance characteristics:

1. Tubular post shall lock automatically when fully extended.
2. Safety post shall have controlled upward and downward movement.
3. Release lever shall disengage the post to allow it to be returned to its lowered position.
4. Post shall have adjustable mounting brackets to fit ladder rung spacing up to 14” on center and clamp brackets to accommodate ladder rungs up to 1-3/4” in diameter.

C. Post: Shall be manufactured of high strength square tubing. A pull up loop shall be provided at the upper end of the post to facilitate raising the post.

D. Material of construction: Steel

E. Hardware: All mounting hardware shall be Type 316 stainless steel.

G. Finishes: Factory finish shall be yellow powder coat steel.

CONSTRUCTION REQUIREMENTS

I. FIXED STEEL LADDER

A. Provide anchorage devices and fasteners as required by the manufacturer to fasten to the concrete vault walls.

II. LADDER SAFETY POST

A. Install safety post according to the manufacturer's installation instructions. The manufacturer shall furnish fasteners as necessary for installing the ladder safety post to the fixed steel ladder.

METHOD OF MEASUREMENT

FIXED ACCESS LADDER shall be measured for payment each fixed steel ladder installed.

BASIS OF PAYMENT

This work will be paid for according to the following.

FIXED ACCESS LADDER shall be paid for at the contract unit price for each fixed steel ladder furnished and installed, including, but not limited to, all labor, materials, and equipment required to install the ladder, and other items incidental to installing the ladder, as shown on the plans.

END OF SPECIAL PROVISION FIXED ACCESS LADDER

FLOOR ACCESS DOORS AND FRAMES

GENERAL

I. This Section includes floor access doors and frames for the Gate Structure

II. SUBMITTALS

Product Data: For each type of access door and frame indicated. Include construction details, materials, individual components and profiles, and finishes.

Shop Drawings: Show fabrication and installation details of access doors and frames for each type of substrate. Include plans, elevations, sections, details, and attachments to other work.

III. QUALITY ASSURANCE

Source Limitations: Obtain access door and frame through one source from a single manufacturer.

Size Variations: Obtain Engineer's acceptance of manufacturer's standard-size units, which may vary slightly from sizes indicated.

IV. COORDINATION

Verification: Determine specific locations and sizes for access doors needed to gain access to concealed plumbing, mechanical, or other concealed work, and indicate in the schedule specified in "Submittals" Article.

MATERIAL REQUIREMENTS

I. ALUMINUM MATERIALS

A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6:

1. Mill finish, AA-M10 (Mechanical Finish: as fabricated, unspecified).

B. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6:

1. Mill finish, AA-M10 (Mechanical Finish: as fabricated, unspecified).

C. Aluminum Sheet: ASTM B 209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than strength and durability properties of Alloy 5005-H15; with minimum sheet thickness indicated representing specified thickness according to ANSI H35.2:

1. Mill Finish: AA-M10 (Mechanical Finish: as fabricated, unspecified).

II. FLOOR ACCESS DOORS AND FRAMES

A. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1. Babcock-Davis, A Cierra Products Co.
2. Bilco Company (The).
3. J. L. Industries, Inc.
4. Karp Associates, Inc.
5. Milcor Inc.

B. Floor Doors, General: Equip each door with adjustable counterbalancing springs, heavy-duty hold-open arm that automatically locks door open at 90°, release handle with red vinyl grip that allows for one-handed closure, and recessed lift handle.

C. D. Aluminum Floor Door: Double-leaf opening. Extruded-aluminum angle frame with 1/4 in. thick, diamond-pattern, aluminum tread plate door; nonwatertight; loading capacity to support 150-lbf/sq ft.

E. Hardware: Provide the following:

1. Hinges: Heavy-duty, stainless-steel butt hinges with stainless-steel pins.
2. Latch: Stainless-steel slam latch.
3. Lock: Keyed deadlock bolt
4. Hardware Material: Manufacturer's standard.

F. Size: 4 ft 0 in. by 4 ft 0 in.

CONSTRUCTION REQUIREMENTS

I. FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated:

1. Exposed Flanges: Nominal 1 to 1-1/2 in. wide around perimeter of frame.

D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed:

1. For cylinder lock, furnish two (2) keys per lock and key all locks alike.

E. Extruded Aluminum: After fabrication, apply manufacturer's standard protective coating on aluminum that will come in contact with concrete.

II. INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.

C. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

III. ADJUSTING AND CLEANING

A. Adjust doors and hardware after installation for proper operation.

B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the item noted below:

GATE STRUCTURE – FLOOR ACCESS DOORS AND FRAMES shall be measured for payment each access door installed.

BASIS OF PAYMENT

This work will be paid for according to the following.

GATE STRUCTURE – FLOOR ACCESS DOORS AND FRAMES shall be paid for at the contract unit price for each access door and frame furnished and installed, including, but not limited to, all labor, materials, and equipment required to complete the installation as shown on the plans.

END OF SPECIAL PROVISION – FLOOR ACCESS DOORS AND FRAMES

GATE BULKHEAD SEALS

DESCRIPTION

This Work shall consist of the furnishing and installing resilient J-seals in accordance with the Drawings and Specifications, including stainless steel clamp bars, stainless steel hardware, stainless steel bearing bars, and non-shrink grout.

MATERIAL REQUIREMENTS

I. J-Seals

A. Molded resilient rubber J-Seals (natural or neoprene), solid bulb, to be mounted on the bottom and sides of the bulkhead gate. Seal material shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents, and plasticizers. The seals shall have a tensile strength of 2,500 psi (minimum), 450% elongation at rupture, 300% modulus at 900 psi (minimum), Durometer hardness (Shore Type A) of 60 to 70, and low temperature brittleness (non brittle after 3' at -25 C).

II. Steel Mounting Plates

A. Plates shall be fabricated from ASTM A240 Type 304 material

III. Fasteners

A. Fastener assemblies for mounting J-Seals shall be ASTM A235 bolts, with ASTM A563 nuts.

CONSTRUCTION REQUIREMENTS

I. Shop Drawings

A. Shop drawings showing all details necessary for fabrication and installation of J-Seals shall be submitted to Engineer for review. Fabrication and erection shall not be started until shop drawings have been accepted by Engineer.

II. Installation

A. The shape of the seal shall produce a seating surface having a minimum width of ¾".

B. Provide fully molded corners of the shape required to make the seal continuous from the side seal to the bottom seal.

C. Seals shall be fitted by the fabricator to the gate in the shop by butting them tightly, one to the other. The ends of all pieces must be cut at right angles, not beveled. Seals should

be cut slightly longer than required to permit such fitting and without buckling or misalignment. No cement shall be used during such fitting.

D. J-Seals shall be attached to the gate to restrict leakage to less than 0.1 gallons per minute per foot of seating perimeter.

E. Upon completion of the gate bulkhead installation, each gate shall be operated a minimum of three (3) complete cycles prior to watering to demonstrate proper function of the seals. The contractor may choose to use water as a lubricant for the seals during testing.

BASIS OF PAYMENT

The work described in this special provision will not be paid for as a separate item, but shall be included in the bid price for Furnishing & Erecting Structural Steel.

END OF SPECIAL PROVISION – GATE BULKHEAD SEALS

GLAZING

GENERAL

I. This section includes glazing for windows and door units.

II. PERFORMANCE REQUIREMENTS

A. Delegated Design: Design glass, including comprehensive engineering analysis according to ASTM E 1300 and the 2012 International Building Code, and latest amendments, by a qualified professional engineer, using the following design criteria:

1. Design Wind Pressures: As indicated in the Structural Drawings.
2. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical, design glass to resist design wind pressure based on glass type factors for short-duration load.
3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

III. PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing will not be required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

IV. ACTION SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.

C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

D. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

V. INFORMATIONAL SUBMITTALS

A. Preconstruction adhesion and compatibility test report.

VI. QUALITY ASSURANCE

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA's "Laminated Glazing Reference Manual" and GANA's "Glazing Manual."
2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction.]. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

VII. WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form in which laminated-glass manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 10 years from date of Substantial Completion.

C. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form in which insulating-glass manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

MATERIAL REQUIEMENTS

I. GLASS PRODUCTS, GENERAL

A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.

B. Windborne-Debris-Impact Resistance: Provide exterior glazing that passes basic -protection testing requirements in ASTM E 1996 for 150 mph wind speed rating for Category III & IV building with Exposure C, per the 2010 Florida Building Code, Section 1609 Wind Loads

1. Large-Missile Test: For glazing located within 30 feet (9.1 m) of grade.

C. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

II. LAMINATED GLASS

A. Manufacturers: Subject to compliance with requirements, available manufacturer’s who’s products may be incorporated into the Work include, but are not limited to, the following:

1. AGC Glass.
2. Oldcastle Building Envelope.
3. PGT Industries.
4. Trulite.

B. Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category I and II materials, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written recommendations.
2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
3. Interlayer Color: Clear unless otherwise indicated.

C. Windborne-Debris-Impact-Resistant Laminated Glass: Provide exterior glazing that passes basic -protection testing requirements in ASTM E 1996 for 90 mph wind speed

rating for Category III & IV building with Exposure C, per the 2012 International Building Code, Section for Wind Loads.

1. Construction: Laminate glass with the following to comply with interlayer manufacturer's written recommendations:

    a. Polyvinyl butyral interlayer.

2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
3. Interlayer Color: Clear unless otherwise indicated.

III. INSULATING GLASS

A. Basis of Design Products: "Sungate 100" Azuria, insulated, Low E glass, manufactured by PPG Industries. Equivalent Substitutions to be approved by the Architect prior to bid.

IV. GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from the following:

1. Neoprene complying with ASTM C 864.

B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.

1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

V. GLAZING SEALANTS

A. General:

1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Sealants used inside the weatherproofing system, shall have a VOC content of not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
4. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

VI. GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

VII. MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

F. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

CONSTRUCTION REQUIREMENTS

I. GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

II. TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Apply heel bead of elastomeric sealant.

F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of

removable stops. Start gasket applications at corners and work toward centers of openings.

G. Apply cap bead of elastomeric sealant over exposed edge of tape.

III. GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

IV. SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

V. CLEANING AND PROTECTION

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact

with glass, remove substances immediately as recommended in writing by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

BASIS OF PAYMENT

The work described in this special provision will not be paid for as a separate item, but shall be included in the bid price for the doors and windows.

END OF SPECIAL PROVISION - GLAZING

GYPSUM BOARD ASSEMBLIES

GENERAL

I. This section includes interior gypsum board and texture finishes for the Lockhouse.

II. ACTION SUBMITTALS

A. Product Data: For each type of product.

MATERIAL REQUIREMENTS

I. INTERIOR GYPSUM BOARD

A. Manufacturers: Subject to compliance with requirements, available manufacturers whose products may be incorporated into the Work include, but are not limited to, the following:

1. American Gypsum.
2. CertainTeed Corp.
3. Georgia-Pacific Gypsum LLC.
4. Lafarge North America Inc.
5. National Gypsum Company.
6. PABCO Gypsum.
7. Temple-Inland.
8. USG Corporation.

B. Gypsum Wallboard: ASTM C 1396/C 1396M.

1. Thickness: 5/8 inch.
2. Long Edges: Tapered

C. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.

1. Core: 5/8 inch, Type X.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

II. TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.

III. JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

IV. AUXILIARY MATERIALS

A. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

B. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing).

1. Recycled Content of Blankets: Postconsumer recycled content plus one-half of preconsumer recycled content not less than (10) percent.

C. Acoustical Joint Sealant: ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings as demonstrated by testing according to ASTM E 90.

1. Products: Subject to compliance with requirements, available manufacturer's who's products may be incorporated into the Work include, but are not limited to, the following:

a. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
b. Grabber Construction Products; Acoustical Sealant GSC.
c. Pecora Corporation; AC-20 FTR
d. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
e. USG Corporation; SHEETROCK Acoustical Sealant.

2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Acoustical joint sealant 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."

CONSTRUCTION REQUIEMENTS

I. TEXTURE FINISHES

A. Primer: As recommended by textured finish manufacturer.

B. Non-Aggregate Finish: Pre-mixed, vinyl texture finish for spray application.

1. Products: Subject to compliance with requirements, available manufacturer's who's products may be incorporated into the Work include, but are not limited to, the following:

a. CertainTeed Corp.; ProRoc Easi-Tex Spray Texture.
b. National Gypsum Company; Perfect Spray EM Texture.

c. USG Corporation; BEADEX FasTex Wall and Ceiling Spray Texture.

2. Texture: Orange Peel.

II. APPLYING AND FINISHING PANELS

A. Comply with ASTM C 840.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

D. Install trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

E. Prefill open joints, rounded or beveled edges, and damaged surface areas.

F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

G. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for tile.
3. Level 3: At joints and interior angles, embed the tape in the joint compound and immediately apply the joint compound over the tape. Apply one additional coat of the joint compound over the tape. Apply two separate coats of the joint compound over fastener heads and flanges of trim accessories. Panel surfaces and the joint compound must be smooth and free of tool marks and ridges.
4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated. At joints and interior angles, embed the tape in the joint compound and immediately apply the joint compound over the tape. Apply two additional separate coats of the joint compound over flat joints. Apply one additional coat of the joint compound over interior angles. Apply three separate coats of the joint compound over fastener heads and flanges of trim accessories. Panel surfaces and the joint compound must be smooth and free of tool marks and ridges. "Drywall primer" must be applied to surfaces before applying final decoration.

    a. Primer and its application to surfaces are specified in Section 09912 "Interior Painting."

H. Texture Finish Application: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.

I. Protect adjacent surfaces from drywall compound and texture finishes and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

J. Remove and replace panels that are wet, moisture damaged, and mold damaged.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

LOCKHOUSE – GYPSUM BOARD ASSEMBLIES shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

LOCKHOUSE – GYPSUM BOARD ASSEMBLIES shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to complete the work as shown on the plans.

END OF SPECIAL PROVISION - LOCKHOUSE – GYPSUM BOARD ASSEMBLIES

HAND COMPACTED EARTH FILL

DESCRIPTION

This work shall consist of furnishing backfill material suitable for repairing voids left in the north berm from tree root ball removal and animal burrows, sourcing and transporting suitable fill material, and the filling and compacting of the voids.

MATERIAL

A. The Contractor shall source suitable material for filling and repairing the voids left in the berm.

B. Suitable material shall consist of cohesive materials with 30 percent or more passing the No. 200 sieve, and have a plasticity index (PI) between 3 and 35. Materials having 85 percent fines by weight that are smaller than 0.05 mm shall not be acceptable.

C. The Contractor shall submit soil classification test results and Standard Proctor Curve.

CONSTRUCTION REQUIREMENTS

I. General

A. Excavation volumes at each tree root ball location will vary based on the extent of the major roots into the berm. For payment purposes, 9 cubic yards of earth fill placed was used per tree and burrow, and shrubs were considered minor enough to not require fill.

II. Cleaning the Voids

A. The Contractor shall clean out the holes and loose material left by the root ball removal prior to backfilling.

B. Burrows or voids found in the berm shall be top excavated to expose the extent of the void and allow for proper compaction.

III. Filling the Voids

A. Once the hole has been cleaned out, the Contractor shall start backfilling the hole in 4 inch lifts and compact the material with pneumatic backfill tampers and hand operated vibratory rammers. The soil shall be compacted to 95% standard proctor.

B. The fill shall continue until the void is filled to the surrounding grade.

C. Voids along the bank of the Fox River shall be filled above and landward of elevation 738.5 to the surrounding grade. Voids below and waterside of elevation 738.5 shall be filled with SHOT ROCK per RIPRAP.

D. The Contractor shall check compaction at 2 ft intervals during the backfilling process.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

HAND COMPACTED EARTH FILL shall be measured for payment per cubic yard in place.

BASIS OF PAYMENT

This work will be paid for as indicated in the various items noted below:

HAND COMPACTED EARTH FILL will be paid for at the contract price per cubic yard placed, including but not limited to, all labor, materials, and equipment required to locate and transfer suitable fill material, and fill and compact the voids left from the removal of trees. The contract price will also include all soil testing and compaction testing services. Measurement will be based on the 9 cubic yard value per tree. No additional compensation will be given if the void is larger.

END OF SPECIAL PROVISION – HAND COMPACTED EARTH FILL

HDPE PIPING

DESCRIPTION

The work shall consist of furnishing, installing and testing High Density Polyethylene pipe (HDPE) of the sizes as required in the Contract Documents and as directed by the Engineer.

The primary installation method is burial. The means and methods, including the testing for acceptance shall conform to all applicable standards as noted herein with the intention of providing a leak-free system to the Department.

MATERIAL REQUIREMENTS

I. HDPE shall meet the following standards:

A. ASTM D3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

B. ASTM D3035 Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter

C. AWWA C906 AWWA Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4 In. (100 mm) Through 63 In. (1,575 mm), for Water Distribution and Transmission

D. AWWA M55 Manual of Water Supply Practices, PE Pipe – Design and Installation

II. Pipe and Fittings

A. The polyethylene material used to manufacture the pipe and fittings should be a high density polyethylene compound that meets or exceeds the minimum requirements in accordance with ASTM D3350. Materials shall be PE 3608 and meet cell classification of 345464C.

B. The dimensions and performance properties of the system should be in accordance with the requirements of any one of the following documents: ASTM D 3035.

C. High density polyethylene pipe fittings shall conform to ASTM D3350 and must be fully pressure rated.

D. 32-inch SDR 17 and 36-inch SDR 17 pipe shall be rated for use at a pressure class of 100 psi, per AWWA C901. All HDPE piping shall be IPS DR 17.

E. 36-inch SDR 32.5 HDPE pipe shall be rated for use at a pressure class of 50 psi, per AWWA C901.

CONSTRUCTION REQUIREMENTS

A. Pipe shall be accurately laid to line and grade to satisfaction of the Engineer.

B. Interior of each length of pipe shall be clean before laying next. No length of pipe shall be laid until previous length has had sufficient bedding materials placed and tamped about it to secure it firmly in place to prevent any disturbance.

C. Pipe shall be so bedded and tamped that no deflections are possible.

D. The pipe joints shall be polyethylene to polyethylene and made by one of the following methods:

1. Thermal Butt fusion weld. (ASTM D2657)
2. Side wall fusion.
3. Lap flanging of stub ends with 304 SST backup rings.

E. Tee or wye fittings, or fittings made of same materials as main line pipe, shall be sized as indicated on the plans.

I. Testing

A. Joints shall be carefully inspected during and after installation.

METHOD OF MEASUREMENT

HDPE Pipe, SDR 17, 32" shall be measured for payment in place in feet of HDPE pipe installed, as measured along the centerline of the pipe. The 32" diameter HDPE lock emptying piping shall be measured from the fitting at the existing lower lock monolith connection to the flanged connection at the new lower lock monolith.

HDPE Pipe, SDR 17, 36" shall be measured for payment in place in feet of HDPE pipe installed, as measured along the centerline of the pipe. The 36" diameter HDPE lock intake pipe shall be measured from the fitting at the intake structure to the flanged connection at the lock diffuser system.

HDPE Pipe, SDR 32.5, 36" shall be measured for payment in place in feet of HDPE pipe installed, as measured along the centerline of the pipe.

BASIS OF PAYMENT

The unit price bid shall include the cost of all HDPE materials and anchor pipe, pipe fittings (including flange adapters with backup rings, reducers as needed for connections), pipe specials; hardware; warning tape; tracer wire; concrete thrust blocks; controlled density fill, joints material; making pipe joints; testing, and furnishing all labor, material and equipment necessary to complete the work. This work will be paid for at the contract unit price per foot for HDPE PIPE of the wall thickness and diameter specified.

END OF SPECIAL PROVISION - HDPE PIPING

HOLLOW METAL DOORS AND FRAMES

GENERAL

This section includes for standard hollow metal doors and frames for the Lockhouse and the Gate Structure.

I. 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.

II. SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions and finishes.

B. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.

III. QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

IV. 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:

1. Provide additional protection to prevent damage to finish of factory-finished units.

B. Deliver welded frames with two (2) removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. 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 in. high wood blocking. Do not store in a manner that traps excess humidity:

1. Provide minimum 1/4 in. space between each stacked door to permit air circulation.

V. PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

VI. 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.

MATERIAL REQUIREMENTS

I. MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1. Amweld Building Products, LLC.
2. Ceco Door Products; an Assa Abloy Group company.
3. Curries Company; an Assa Abloy Group company.
4. Kewanee Corporation (The).

II. MATERIALS

A. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

1. Exterior Doors: Minimum A60 metallic coating.
2. Interior Doors: Minimum A40 metallic coating.

B. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized:

1. 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.

C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

D. Grout: ASTM C 476, except with a maximum slump of 4 in., as measured according to ASTM C 143/C 143M.

E. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

III. 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:

1. Design: Flush panel.
2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core:

a. Thermal-Rated (Insulated) Doors: Where indicated, provide doors fabricated with thermal-resistance value (R-value) of not less than R-3.57:

1) Locations: Exterior doors at Lockhouse and Gate Structure.

3. Vertical Edges for Single-Acting Doors: Beveled edge:

a. Beveled Edge: 1/8 in. in 2 in.

4. Top and Bottom Edges: Closed with flush or inverted 0.042 in. thick, end closures or channels of same material as face sheets.
5. 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:

1. Level 1 and Physical Performance Level C (Standard Duty Doors and Frames), Model 1 (Full Flush) at Lockhouse:

a. Width: 1-3/4 in.

2. Level 3 and Level A performance (Extra-Heavy-Duty Doors and Frames), Model 1 (full Flush) at Gate Structure:

a. Width 1-3/4 in.

C. Interior 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:

1. Level 1 and Physical Performance Level C (Standard Duty), Model 1 (Full Flush):

a. Width: 1-3/4 in.

D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

E. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

IV. 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:

1. Fabricate frames with mitered or coped corners.
2. Frames for Level 1 Steel Doors: 0.042 in. thick steel sheet.

C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

V. FRAME ANCHORS

A. Jamb Anchors:

1. Post installed expansion type for in place concrete or masonry. Minimum 3/8 in. diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, not less than 0.042 in.thick, and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

VI. ACCESSORIES

A. Grout Guards: Formed from same material as frames, not less than 0.016 in. thick.

CONSTRUCTION REQUIREMENTS

I. 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.

C. Hollow Metal Doors:

1. 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.

D. 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:

1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
2. Provide countersunk, flat or oval head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
4. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
5. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Post-installed expansion type: Locate anchors not more than 6 in. from top and bottom of frame. Space anchors not more than 26 in. o.c.

6. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction:

    a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

E. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold or hot-rolled steel sheet.

F. 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 Division 08 Section "Door Hardware:"

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

II. 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.

III. EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

IV. 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:

1. Squareness: Plus or minus 1/16 in., measured at door rabbet on a line 90° from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16 in., measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16 in., measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 in., measured at jambs on a perpendicular line from head to floor.

C. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

V. 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:

1. 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:

a. 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.
b. Install frames with removable glazing stops located on secure side of opening.

c. Install door silencers in frames before grouting.
d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
e. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
f. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors:

a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. In-place Concrete: Secure frame in place with post installed expansion anchors. Countersink anchors, and fill and smooth, flush, and invisible on exposed faces.
4. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

a. Squareness: Plus or minus 1/16 in., measured at door rabbet on a line 90° from jamb perpendicular to frame head.
b. Alignment: Plus or minus 1/16 in., measured at jambs on a horizontal line parallel to plane of wall.
c. Twist: Plus or minus 1/16 in., measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
d. Plumbness: Plus or minus 1/16 in., measured at jambs at floor.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary:

1. Non-Fire-Rated Standard Steel Doors:

a. Jambs and Head: 1/8 in. plus or minus 1/16 in.
b. Between Edges of Pairs of Doors: 1/8 in. plus or minus 1/16 in.
c. Between Bottom of Door and Top of Threshold: Maximum 3/8 in.

2. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 in.o.c. and not more than 2 in.o.c. from each corner.

VI. 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.

C. 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.

D. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

GATE STRUCTURE - DOORS shall be measured for payment as a single lump sum item.

LOCKHOUSE – DOORS shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

GATE STRUCTURE – DOORS shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to install the doors, and other items incidental to the installation, as shown on the plans.

LOCKHOUSE - DOORS shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to install the doors, and other items incidental to the installation, as shown on the plans.

END OF SPECIAL PROVISION – HOLLOW METAL DOORS AND FRAMES

HUMAN MACHINE INTERFACE (HMI) SYSTEM

GENERAL

I. Summary

A. Section Includes:

1. HMI hardware.
2. HMI Software.
3. Accessories and maintenance materials.

II. Quality Assurance

A. Referenced Standards:

1. Institute of Electrical and Electronics Engineers, Inc. (IEEE):

a. 802.3, Information Technology - Local and Metropolitan Area Networks - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications.
b. 802.3u: IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T.
c. 802.3x: IEEE Standards for Local and Metropolitan Area Networks: Specification for 802.3 Full Duplex Operation.

III. Definitions

A. HMI: Human Machine Interface.

B. LCD: Liquid Crystal Display.

C. OPC: "OLE for Process Control", a software standard utilizing a client/server model that makes interoperability possible between automation/control applications and field systems/devices.

D. RAID: Redundant Array of Independent Disks, a method of storing the same data in different places on multiple hard disks.

E. RAM: Random Access Memory.

F. SCSI: Short for Small Computer System Interface, a parallel interface standard used for attaching peripheral devices to computers.

G. SDRAM: Synchronous Dynamic RAM.

H. SNMP: Simple Network Management Protocol, a set of protocols for managing complex networks.

I. TFT: Thin-Film Transistor, a technology for building LCD screens.

IV. Submittals

A. Product technical data including:

1. Acknowledgement that products submitted meet requirements of standards referenced.

B. Operation and Maintenance Manuals:

MATERIAL REQUIREMENTS

I. Panel Mounted HMI Computers

A. Acceptable Manufacturers:

1. Allen-Bradley VersaView.
2. GE QuickPanel.
3. Siemens SIMATIC MP .
4. Schneider (Modicon) Magelis.

B. Design and Fabrication:

1. Integrated display computer with solid-state drive.
2. Minimum processing speed: 2.0 GHz.
3. Storage drive: minimum 8 GB.
4. Operating System: Windows XP Professional, SP2 for Solid-State Drives.
5. Display: color graphics.
6. Touch screen.
7. 120 Vac power supply.
8. Provide password protection to prevent unauthorized entries for a minimum of two (2) levels:

    a. Authorization to operate.
    b. Authorization to adjust setpoints.

9. Communicate via Ethernet to HMI Network.
10. Operating temperature: 32 DegF to 131 DegF.
11. Humidity: 10 to 90 percent RH non-condensing.

II. Panel Mounted Operator Interface Terminals (OIT)

A. Acceptable Manufacturers:

1. Allen-Bradley Panel View Plus.
2. GE QuickPanel.
3. Schneider Electric (Modicon) Magelis.

B. Design and Fabrication:

1. Display: color graphics.
2. Touch screen.
3. 120 Vac power supply.
4. Real time battery-backed clock, time stamp data.
5. Communicate via Ethernet to HMI Network.
6. Provide password protection to prevent unauthorized entries for a minimum of two (2) levels:

    a. Authorization to operate.
    b. Authorization to adjust setpoints.

7. Operating temperature: 32 DegF to 131 DegF.
8. Humidity: 10 to 90 percent RH non-condensing.

C. Configuration software:

1. Provide latest version of configuration software licensed to Department.

III. Software

A. Provide all software and associated programming/configuration required to meet performance requirements of the Contract Documents.

1. At substantial completion of the Project:

    a. Turn current licenses for all software over to the Department in the Department's name and install the latest version, upgrade or service pack for all software.
    b. Provide the respective software supplier's Comprehensive Support Contract for all software covering a full one (1) year warranty period following substantial.

B. HMI Software:

1. Manufacturer’s standard software package compatible with supplied HMI devices.
2. Runtime HMI software:

    a. Provide individually licensed software with capability for all HMIs to be active simultaneously.

3. Tag name quantity requirements:

    a. As required to meet performance requirements of the Contract Documents.
    b. Capable of handling an additional 20 percent more tags (future expansion) without impacting the license.

C. Ethernet Network Management Software:

1. Software to include an OPC Server, capable of integrating real-time SNMP tag data into OPC client enabled HMI software databases.
2. Software shall allow control of polling rate for SNMP requests, as well as limit access to write SNMP data on each SNMP tag.
3. Software shall have pre-developed tag databases for several manufacturer's Ethernet network devices, as well as generic MIB (Management Information Base) tag databases.
4. Software shall have integrated OPC client data viewer software, so that SNMP data may be viewed without having to create HMI tags.

D. All software must be latest edition and licensed to the Department.

IV. Accessories And Maintenance Materials

A. Provide all accessories required to furnish a complete computer-based network for the control system to accomplish the requirements of the Drawings and Specifications.

CONSTRUCTION REQUIREMENTS

I. Installation And Checkout

A. Provide installation and checkout.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION – HUMAN MACHINE INTERFACE (HMI) SYSTEM

HYDRAULIC PIPING, BALL VALVES AND WINCH EQUIPMENT

GENERAL

I. Provision Includes:

A. Stainless Steel Pipe and Fittings

B. Valves

C. Winches and their Hydraulic Power Units (HPU-2)

D. Hydraulic Hose

II. Submittals

A. Ball Valves and Winch Equipment

1. Manufacturers Product Data
2. Operation & Maintenance Manuals and Installation Instructions

B. Pipe and Pipe Fittings and Hydraulic Hose

1. Manufacturers Product Data

MATERIAL REQUIREMENTS

I. Stainless Steel Pipe (Tubing)

A. Piping, fittings, valves, and accessories:

1. Piping: ASTM A-213 or 269, Type 316 stainless steel. Seamless tubing with a working pressure rating of 3750 psig or higher.
2. Fittings: Compression type, 316 stainless steel with at least 3000 psig working pressure rating, compatible with tubing.
3. Hangers and Support: Stainless Steel, 316.

II. Valves

A. Ball Valves

1. Ball valves shall be not less than 3,000 lb. (WOG), all 316 stainless steel construction, Lubetal and/or TFE seats, lever handle, compression and compatible with project tubing, resilient seat and packing suitable for hydraulic fluid and temperature range of -40 to 200 F or broader. Valves for 1/2" tubing shall have at least 0.406" port and valves for ¾" tubing shall have at least 0.472 port.

a. Manufacturers and models:

1) Swagelok AFS series or equal

III. Winch Equipment

A. Hydraulic Control Valves

1. Four-way double acting rated at least 3000 psig with pressure relief set at 1500 psig.
2. Open center, 6 GPM, 3/8" NPTF port sizes.
3. Solid casting, ground and chromed spool fitted to the body.
4. Acceptable manufacturer and model to match others already in use at project:

    a. Williams Machine & Tool 230HXSR.

B. Hydraulic Power Unit (Tag HPU-2)

1. Portable steel frame package on 6" rubber coated casters.
2. Single phase 230 volt 5 hp motor, 15 gallon tank and 230 volt 1 phase control box.
3. Complete with 3/4" high pressure 2 wire (100R2) by 10 ft. long hose assemblies with male pipe on one end and female on other, dripless quick connects.
4. Acceptable manufacturer and model to match others already in use at project:

    a. Allied Power Products, Inc., Beaverton, OR, Model HPU5E.

C. Winch

1. Pulling capacity 35,000 lbs., 200 psi at 30 GPM.
2. Redundant braking systems; spring-applied.
3. Integral air-shift disengagement for free spool operation.
4. Three layer 3/4" rope capacity of at least 113 ft.
5. Each with 7/8"x 25 ft. long 6 x19 stainless steel wire rope and stainless steel thimble eye.
6. Each with 3/8" high pressure 2 wire (100R2) hydraulic hose with male pipe one end and #10 SAE 1 wire (100R1) hydraulic hose with 3/8" male pipe one end and #10 JIC female other end, both 5' long.
7. Acceptable manufacturer and model to match others already in use at project:

    a. TWG Tulsa 3541RL.

IV. Hydraulic Hose

A. Hose shall be designed for hydraulic service in industrial jobs.

B. Interior shall be oil resistant nitrile.

C. Cover shall be oil and weather resistant neoprene.

D. Hose shall have alternating spiral layers of high tensile steel wire reinforcement.

E. Temperature range shall include -40 to 250F.

F. Provide hose with brass or stainless steel end fittings/couplings.

G. Hose shall be rated for not less than 3,000 psi and shall have a bend radius not greater than 9.5" in 3/4" dia. size.

H. Manufacturers: Dayco, Goodyear or Parker

CONSTRUCTION REQUIREMENTS

I. Piping

A. Systems shall be installed as shown on the Drawings, and in a neat and workmanlike manner using only new materials. Lines shall be installed parallel with or at right angles to walls unless otherwise shown on Drawings.

B. Materials and equipment shall be thoroughly cleaned and inspected, prior to installation. No cracked, broken or defective piece shall be used in the work.

C. The interior surfaces of all piping and equipment shall be cleaned and free of all dirt, loose scale, rust, and other foreign material before installation.

D. Pipe ends shall be reamed to remove all burrs, and pipe sections shall be cleaned inside to remove all chips and foreign material prior to making up joints. Pipe lines shall be installed with as few joints as possible and short lengths of pipe coupled together shall not be used. Pipe shall not extend into the waterway of the pipe fitting.

E. Prior to joining the pipe, the ends of the pipe to be jointed and the jointing material shall be clean and dry. The interior of the pipe shall be cleaned of all foreign materials as the work progresses. At the end of the work day, temporarily plug and block all open ends of pipe.

F. Unless otherwise noted, bending of pipe shall not be permitted, only ells shall be utilized for a change in direction. Pipe joints shall not be deflected in an amount greater than recommended by the manufacturer.

II. Piping Connections

A. Threaded Connections

1. Threaded joints shall be in accordance with ANSI B2.1. Threaded joints shall be made up Teflon tape of lead free pipe joint compound applied to the make thread only. Should a joint be loosened after being made up, it shall not be made up a second time unless the threads are cleaned and new compound applied.

B. Compression Connections

1. Follow the written instructions of the connection manufacturer.

III. Exposed Pipe

A. All exposed piping, valves, and fittings shall be securely fastened to the structure with hangers, supports, guides, anchors or sway braces to maintain pipe alignment, prevent sagging and straining due to uncontrolled movement. All supports shall support the

weight of the pipe, fittings, valves and contents without exceeding the maximum recommended load for the pipe support.

B. Pipe supports shall be installed with anchorage adequate to develop the maximum recommended load of the pipe support. Contract shall provide additional supports which may be determined as necessary by the Department for the proper suspension, bracing, or support for the pipe.

IV. Valves Installation

A. Valves shall be installed at all points indicated on the Drawings. Where Drawings do not specifically indicate a valve size, valves shall be same diameter as the pipe it serves.

B. All valves shall be installed with stems vertical wherever possible and shall not be installed with stems below horizontal under any condition.

C. All valves shall operate freely without binding or sticking in any position from fully open to fully closed. Any valves that do not operate freely shall be adjusted to the satisfaction of the Engineer or replaced.

D. Ball valves with rigid piping on both sides shall be 2-piece with unions or other method for removal without disturbing piping or shall be 3-piece.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – MECHANICAL WORK (HVAC) as shown on the Mechanical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – MECHANICAL WORK (HVAC) shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION - HYDRAULIC PIPING, BALL VALVES AND WINCH EQUIPMENT

HYDRAULICALLY OPERATED HINGE CREST GATE

DESCRIPTION

I. SUMMARY

A. This section specifies the engineering, design, manufacture, fabrication, quality control, shop assembly, testing, delivery, and installation of the hydraulically operated bascule style; hinge crest gate.

B. The Contractor is responsible for the final design of the gate, operating mechanisms, hydraulic power unit, and controls. Details shown on the drawings indicate the basic geometry of the gate, its relationship to the concrete training structure and anticipated configuration of the operating system and hydraulic power unit.

C. Design Codes and Standards

1. American Institute of Steel Construction (AISC), Steel Construction Manual, 13th Edition
2. American Welding Society (AWS), Structural Welding Code – Steel, AWS D1.1, 2006 Edition
3. American Concrete Institute (ACI), Building Code Requirements for Structural Concrete and Commentary, ACI 318, 2005 Edition.
4. American Society of Civil Engineers Design of Hydraulic Steel Structures.
5. U.S. Army Corps of Engineers Design of Hydraulic Steel Structures EM 1110-2-2105, 31 May 1994.

II. GENERAL REQUIREMENTS

A. The design and assembly of the gate, operating mechanisms, hydraulic power unit, and controls shall be by an approved commercial gate company routinely engaged in the design and manufacture of torque tube hinge crest gates. The gate shall be mounted within the training structure as depicted on the drawings. When in the fully raised position, the gate may incline downstream approximately 10 to 20 degrees measured from the vertical, on the line connecting the center of the torque tube to the top of the gate. The gate shall rotate approximately 80 to 90 degrees from the fully raised to fully lowered position.

1. Sizes as shown on the Drawings (and confirmed by the Contractor), complete with hydraulic actuators, hydraulic power unit, bearings, seals, controls and other associated embedded parts including, but not limited to, the bottom seal members, side seal member, bearing plates, and anchors.

B. The intended use of the gate will be to regulate the water surface within the channel. The gate shall be able to be positioned at the fully closed (raised), fully open (lowered) and any position in between. The gate shall have the ability to be operated from any position.

C. The following companies are listed as pre-approved gate design engineers and manufacturers. The Contractor may elect to submit an alternate gate manufacturer for review and approval by the Engineer. In any case, the manufacturer shall have been regularly engaged in the design and manufacturer of the type of gate specified for a

minimum of 10 years. The complete gate assembly shall be the designed and manufactured product of one company. Inclusion of components from suppliers who routinely provide components to the gate manufacturer, as part of the assembly, is acceptable.

Steel-Fab, Inc.
430 Crawford Street
Fitchburg, MA 01420
(978) 345-1112
Contact: Mr. Louis Bartolini
www.steel-fab-inc.com

Rodney Hunt Company
46 Mill Street
Orange, MA 01364
(800) 448-8860
Contact Person: Mr. Gayle Williams
www.rodneyhunt.com

D. The Contractor shall assume total responsibility with respect to the gate purchasing and installation, including embedments in the concrete.

E. The control system shall be designed and manufactured by a company who is regularly engaged in the design and manufacture of controls for heavy infrastructure systems (Lock and Dam gates, Movable Bridges, etc.) and shall demonstrate at least 10 years experience in the production of similar type units.

III. SUBMITTALS

A. General. Approval of the submittals either as submitted or revised as a result of the review, shall not be interpreted as the Engineer or Owner accepting responsibility for the performance of the system and shall not relieve the Contractor of full responsibility for the proper design, installation of both the individual system components and the entire system. After approval for installation, the Contractor shall install the system and shall make no alteration to the planned system without the prior written approval of the Engineer. The Engineer's review and approval of this submittal does not constitute verification that the system will perform as specified. This review is for quality assurance purposes to preclude the installation of a system which is obviously deficient and incapable of meeting the specified requirements.

B. Contractor's Experience. The Contractor shall submit his qualifications of similar past projects for the installation of torque tube hinge crest gates or similar water control gate structures for review by the Engineer.

C. Gate Design and Shop Drawings. The Contractor shall submit the gate design and shop drawings for Engineer's review prior to gate fabrication or field construction. The gate design drawings shall be prepared by the gate manufacturer and bear the seal of the Structural Engineer licensed in the State of Illinois responsible for the design. The detail drawings shall indicate separate identification marks for each different unit, location of units, elevations, fabrication details, welding details, reinforcement, connections,

dimensions, interface with adjacent members, blocking points for units stored and shipped to the jobsite, lifting points and special handling instructions in sufficient detail to cover manufacture, handling, and erection. Shop drawings shall indicate, as a minimum, design data, member dimensions, cross sections, connection details, lifting devices, and method of erection. Shop drawings shall be detailed fabrication drawings of the system.

D. Manufacturer's Catalog Data. Manufacturer's Catalog data shall be submitted for the specific components obtained from outside manufacturers.

E. Gate Design Calculations. The Contractor shall submit a complete gate design, prepared by the gate manufacturer, that has been designed and sealed by a professional engineer licensed to practice in the State of Illinois. The gate design calculations submitted shall document the gate capacity, anchorage system, and all associated components showing that the gate provided meets or exceeds the specified design, material, and performance requirements. The gate bearing and torque tube calculations shall include a deflection analysis such that binding does not occur during the maximum loading condition. Structural design calculations and details shall bear the seal of the Structural Engineer licensed in the State of Illinois responsible for their preparation.

F. Hydraulic System Calculations. The contractor shall submit a complete set of calculations for the hydraulic system. These calculations shall include the cylinder loads over the complete range of motion. The cylinder anchor points shall have calculations performed for all loading conditions. The hydraulic power unit (HPU) shall have flow capacity calculations under normal operating conditions, heat loading of the system, and a dynamic stability analysis. The HPU shall be U.L. listed.

G. Control System Calculations. The Contractor shall perform all necessary calculations for the control system to assure proper operation, that the system has redundancy and is failsafe. The control system shall be U.L. listed.

H. Manufacturer's Installation Instructions. The manufacturer of the gate shall provide an installation manual for the Contractor and Engineer that describes in detail the method of installation of the gate at the project site. The installation instructions shall include, but not be limited to, defining acceptable lifting points and special handling instructions in sufficient detail to cover handling and erection of the gates.

I. Operations and Maintenance Manual. The Contractor shall submit an Operations and Maintenance manual in compliance with the "Operations and Maintenance Manual" section of this Special Provision.

J. Demonstration and Training. Contractor shall provide demonstration and training for Department's personnel in compliance with the "Operations and Maintenance Manual" section of this Special Provision.

DESIGN REQUIREMENTS

I. General

A. The Contractor shall be responsible for the design of the gate, gate equipment and their design for reliable operation. The design requirements specified in this Special Provision

are intended only to be minimum requirements. The Contractor shall use more restrictive or more stringent design methods, design loads, codes and standards consistent with normal engineering practices, as deemed necessary.

B. The gate shall be constructed of structural steel and protected with a paint coating system applied to protect the gate. Manufacturer's design shall include an appropriate reduced allowable stress due to corrosion of the gate components. Provide documentation of the corrosion allowance as part of the sealed design calculations.

C. The gate shall be operated via two hydraulic cylinders and one hydraulic power unit housed within the adjacent vault. The two cylinders shall be positioned in a parallel arrangement on the same end of the torque tube for each gate.

D. The gate will be located outside and will be subject to weather conditions, freezing and thawing conditions, full submersion, extreme temperatures, and the submerged torque tube and components subject to freezing solid. The type of water is fresh water. The hydraulic power unit will be located within a heated structure. The hydraulic system shall be designed to operate with an ambient air temperature ranging from 20 degrees F to 110 degrees F. External components shall be designed to operate with an ambient air temperature ranging from -20 degrees F to 110 degrees F.

E. Water will discharge over the top of the gate. Design for a maximum head over the gate of 6" when the gate is in the full upright position.

F. The gate lifting system shall have sufficient capacity to raise the gate from the fully lowered position against the water discharges overtop the gate when the upstream water level is at Elevation 737.0. The gate lifting system shall include two gate operating cylinders located in a concrete vault at one end of the gate. It is anticipated that one hydraulic power unit will serve all three gates with dual, alternating pumps and motors designed to operate alternating cylinders for each successive gate operation.

G. The gate shall fit within the training structure

H. The gate leaf shall be continuously connected or welded. The welds connecting the upstream and downstream skin plates to each other and to the vertical ribs shall develop the full strength of the plates. Welded joints shall be designed for appropriate fatigue categories.

I. Gate maintenance support braces shall be designed and provided by the gate manufacturer. The support braces shall be temporary devices used to support the gate during maintenance periods that would require disabling the hydraulic operating cylinder. Support braces shall be configured to allow adjustment from fully closed to ¾, ½ and ¼ open.

II. Design Loadings

A. Gravity. The gate shall be designed for its self-weight, any appurtenant features and weight of water above and within the gate.

B. Water. The gate and gate lifting equipment shall have sufficient capacity to raise the gate from the fully lowered position to the fully raised position using the anticipated water surfaces. Anticipated water levels range at the site is described in paragraph IV - "Water

Surface Levels". The gate and gate operating equipment shall be designed to resist the impounded water when the gate is closed. The load due to negative air pressure on the downstream face of the gate when discharging water shall be accounted for (if occurring) in the gate design.

C. Seismic. The design of the gate structure, operators and anchorage shall not be required withstand a seismic loading condition.

D. Ice or Debris. The gate structure, hydraulic cylinders and piping system shall be designed to withstand a horizontal ice thrust of 1,500 pounds per linear foot of gate. The thrust shall be applied horizontally within 1.0-foot from the gate top lip. The specified ice load is intended to account for impact of debris that may include timber, ice and other foreign objects, or lateral loading due to thermal expansion of ice sheets.

E. Friction. The gate structure and operators shall include the design frictional resistance between the side seals and side seal plates when the gate is opening or closing, design frictional loads in the gate hinges and any surface ice that may adhere to the gate structures and seals. Frictional loads shall be estimated by the gate manufacturer and accounted for within the design of the gate. The following minimum friction coefficients shall be used in the calculations:

Materials	Static	Dynamic
▪ Lubricated (greased) bearings	0.30	0.30
▪ Self lubricated bearings	0.15	0.10
▪ Bronze on stainless steel (unlubricated)	0.40	0.20
▪ UHMW-PE on stainless steel	0.26	0.13
▪ Rubber seals on steel	1.50	0.80
▪ Rubber seals with fluorocarbon sealing surfaces on steel	0.20	0.10
▪ Steel on steel (unlubricated)	0.50	0.25

F. Adhering Ice. The gate design shall account for any ice adhering to the gate, features and seals. Ice removal measures shall be incorporated and included within the gate design as required to ensure the gate functionality.

G. Design Load Combinations. The gate manufacturer shall determine the design loads and loading combinations for the gate design. Gates shall be designed for all applied loads and operator loads including all axial, bending, shear and torsion loads and shall be subject to fatigue loading from the worst loading condition caused from static and dynamic loadings in any position. Thermal loads shall be considered in the design load combinations.

H. Deflection. The gate manufacture shall perform a deflection analysis of the gate under various loading conditions to assure that the assemblies do not undergo bending that would contribute to excessive friction.

III. Design Criteria

A. General. The gate, operators, and anchorage (embedment) to the concrete structure shall be designed for all applied loads and operator loads including all axial, bending, shear and torsion loads, and shall be subject to fatigue loading from the worst loading condition caused from static and dynamic loadings in any position. The gate shall be designed so it can be operated under varying differential head conditions in any position without objectionable or detrimental vibration of the gate.

B. Steel Design and Bolted Connections. All structural steel, bolts, welds and connections shall be designed in accordance with the American Institute of Steel Construction Steel Construction Manual. For normal loading conditions, the allowable stress shall not exceed 75 percent of those permitted by the AISC Specification. For extreme loading conditions, the allowable stress may be increased by 33% provided they do not exceed 80 percent of the elastic limit of the material.

C. Weld Design. All welds shall be designed in accordance with the American Welding Society AWS D1.1. All welds shall be designed not to exceed 75 percent of the allowable strength as determined by AWS D1.1. Welded field connections on major structural components shall not be permitted.

D. Concrete Design. All reinforced concrete and embedment of bolts used for anchorages shall be designed in accordance with American Concrete Institute ACI 318.

E. Biaxial Stress Conditions. Biaxial stresses shall be in accordance with the Hencky von Mises criterion of failure:

$$\frac{Fy}{n} = \sqrt{F_X{}^2 + F_Y{}^2 - F_X - F_Y + 3T_{XY}{}^2}$$

Where

Fy = minimum specified yield strength of the material
n = factor of safety (2.5 for normal loading and 2.0 for extreme conditions
F_X = normal stress in x-direction
F_Y = normal stress in y-direction
T_{XY} = Shear Stress

F. Fatigue. The gate shall be designed to account for fatigue strength of the gate and provide acceptable fatigue connection details.

G. Vibration. The gate shall be designed to have no objectionable or detrimental vibration of the gate when in any position. Aeration shall be provided if necessary to prevent excessive negative pressures downstream of the gate with reasonable velocities in the aeration pipes. It shall be the responsibility of the gate manufacturer to determine the necessity of the air vent piping and to determine the size, location and shape of the air vent piping system. The system shall have protective, stainless steel screens on both the inlet and outlet.

IV. Water Surface Levels

A. The gate shall be designed to be operated through a range from fully opened to fully closed position.

B. The top of the gate leaf in the fully raised position shall be at Elevation 737.25.

C. The gate in the fully opened position (lowered position) shall not be higher than elevation 731.0.

D. The gate will be used to control the level of water within the channel.

E. Under maximum conditions the gate shall be designed for:

1. A maximum impounded water surface elevation of 737.75 before the gate will be lowered.
2. A maximum water surface elevation of 737.0 against which the gate will be raised.

F. Under summer operations, the gate is lowered when the upstream water surface elevation reaches elevation 737.0. The gates are raised when the upstream water surface elevation drops to elevation 735.5.

G. Under winter operations, the gate is lowered when the upstream water surface elevation reaches elevation 735.5. The gate is raised when the upstream water surface elevation drops to elevation 735.0.

V. Gate Geometric Requirements

A. In the open position, the upstream face of the gate shall be no higher than the approach sill at Elevation 731.0.

B. In the fully closed position, the top of the gate leaf shall be at elevation 737.25.

VI. Gate and Channel Safety and Redundancy Features

A. Loss of Electrical Power: Gate shall be controlled such that during power outages it remains in the position set at the time of the outages.

1. PLC Controls shall have battery backup to allow lowering of the gate to release flows.
Temporary power generator shall restore full control of the gates during a power outage.

B. Hydraulic Power Unit shall be equipped with two pumps to allow continuous operation in the event of failure of a single pump and during maintenance/servicing operations.

C. High intensity strobe warning lights to signal the impending movement of the structure shall be located on the upstream and downstream walls of the gate control house. An audible alarm (air horn) shall be mounted on the gate control house such that any personnel on the downstream side of the gate can hear the alarm during gate operation. Theses components shall be integrated with the control system.

VII. Mechanical

A. Mechanical fits and finishes should meet the requirements of ANSI B4.1-1967 R 1987 standards unless more stringent fits and finishes are required by the manufacturer: Gate hinges RC8, Hydraulic cylinder connections RC6. Interference fits FN2, keys and keyways LC4. Turned bolts in finished holes LC6. Finishes of machined parts shall have: Hinge bearings and shafts 63 m-in, machinery parts in fixed contact 125 m-in, sliding bearings 32 m-in.

B. A pair of hydraulic operators is required for each gate. The cylinder shall be of rugged construction and shall be assumed to be operating in a continuously wet environment. The cylinder shall be equipped so the gate does not drift. The cylinder shall have seals sufficient for no less than 3000 psi operating pressure. Rod shall be chrome over stainless steel design.

C. Each gate shall be equipped with a position sensor located per the manufacturer's instructions. The use of an inclinometer for position sensing will not be allowed. The position sensing system shall be an absolute type which will retain the position reading during loss of electrical power. The position sensing system shall be of sufficient accuracy and resolution to allow gate true position sensing to within +/- 1/4 inch.

D. One Hydraulic Power Unit (HPU) shall be provided for the project. The HPU shall be located within Vault No. 1, as shown on the Drawings. For future maintenance purposes, all components of the HPU shall be sized to pass through the nominal 4' x 8' vault access door shown on the plans. The unit shall be capable of operating all three gates. Operating only one gate a time, the unit shall be capable of completing two full raise/lower cycles continuously. The HPU shall supply no less than 3000 psi pressure to the hydraulic operator and meet the operating time requirements. The HPU shall be designed such that it has a minimum of two, 240V single phase pumps/motors such that one set can be removed for maintenance and allow the system to function. The HPU will be required to provide fluid sufficient to operate the gate through a full raise lower cycle and to provide incremental adjustment of the gate's position. The system shall be supplied with an integral reservoir of sufficient capacity. The HPU shall be designed to interface with the dam control system for remote operation and shall have a local control panel for maintenance operation. The local control panel shall have a key lock to prevent unauthorized use. The interface shall allow HPU start/stop capability and alarms for clogged filters, high or low fluid temperature, high or low pressure. The system shall be designed to operate with an ecological compatible fluid. The operating fluid shall be approved by the Engineer and shall allow normal operation under a temperature range from 20 degrees F to 110 degrees F.

E. Gate Operating Manifold. The gate shall have an individual valve manifold which includes the directional control valves. The manifold shall be of rugged integral design and shall be supplied by the HPU manufacturer. Isolation valves shall be provided at the manifold to allow for isolation from the system and cylinder. The system shall be designed and tested for no less than 3000 psi operation. All components shall be 3000 psi rated. The manifold shall be designed to allow wall mounting and shall have a removable Stainless steel cover. The manifold shall be integral to the local control panel.

F. Operating Speed. The gate shall be operable within a suitable speed to allow the gate to open from the fully closed position or close from the fully open position within no longer than a 20 minute period under normal operating conditions.

G. Hydraulic components and piping. All piping and piping components shall be stainless steel and shall be rated for no less than 3000 psi continuous operating pressure. Piping shall meet ANSI 31.3 requirements. All supply, return and drain lines shall be hard piped between the HPU, manifold, and bases of the gate cylinders. Manufacturer's cylinder piping shall be rated 3000 psig and include flexible hose which is resistant to UV, moisture and minor impact damage for connection to hard piping at cylinder bases.

VIII. Gate Controls – Gate controls shall be interfaced with controls of other systems (pumps, valves, drain lines). The following presents the general requirements for the gate control system.

A. The gate operating system shall be configured for operation in local, remote and automatic modes. A control station shall be provided at the gate. Gate will normally be operated in the remote mode.

B. The control system shall be a PLC based, integrated control system. Two levels of control shall be provided. A local control will allow control of all three gates from Vault No. 1; plus manual controls at Vault Nos. 2 & 3 for their respective gates. Remote controls shall be through separate Dam Control System.

C. The remote controls will perform the following functions using a menu driven touch screen:

- Provide for setpoint control for the gate.
- Provide a digital level indication for the gate.
- Constantly monitor the position of the gate as compared to its setpoint and raise or lower the gate to account for drift within a preset deadband. The system will sum the total drift from the last setpoint entered and provide an alert if the total drift and correction has exceeded a pre-established limit.
- The Dam Control System will monitor the local Emergency Stop button.

D. A local control panel at each vault will be provided to allow manual control of the gate. The local touch screen will enable the operator to change the gate's setpoint. The system shall prompt the operator for an authorization code prior to enabling the setpoint control modification.

At the local control point, a readily accessible, hard wired Emergency Stop Button will be provided to stop all gate processes by interrupting control power to all control valves and shutting down the Hydraulic Power Unit.

E. The communication between the local gate control panel and Dam Control System shall be through individual discrete and analog I/O points.

F. The remote PLC will feature a touch screen display that will mimic the display located at the local control panel. The remote panel will include an emergency stop button to stop the process without resorting to the use of the touch screen controls. An alarm buzzer will also be included to alert the operator to alarm or trouble conditions. All alarms and events will be logged in a nonvolatile buffer at the remote PLC.

G. The PLC system shall be designed to be fault sensing to alarm upon loss of communication. Loss of communication will also trigger a shutdown of any ongoing process, unless a hardwired Local/Remote control switch at the local control panel is in the Local position. A loss of communication will initiate an audible and visual at the local and remote control points. Re-establishing the connection will automatically silence the alarm, although the event will be logged in the alarm buffer.

H. The local and remote PLCs will be provided with Uninterruptible Power Supplies (UPS) to allow the PLCs to ride out power fluctuations without affecting the PLC operation.

The UPS will be sized according to the Department's expectation of the duration of the power fluctuation. The UPS will not be sized to allow any movement in the gates via the HPU. Any other Department-supported communication components such as routers and modems must be provided with a UPS to maintain communication between the remote and master locations during power outages if so required.

I. The use of an integrated PLC system will allow the programmer to display the setpoints in units compatible with the Department's operating procedures, such as gate tip elevation. Hydraulic system pressure and temperature shall also be displayed.

J. The software license and program for the gate control system shall be the property of the Department. The program will be provided with three back-up copies on CD and one paper copy included within the maintenance manual. The contractor shall provide a complete maintenance manual for the Control system. This manual will include a systems drawing, component catalog cuts and manufacturer's recommended maintenance procedures. Three copies of the manual shall be provided to the Engineer. A Preliminary manual shall be provided for review by the Engineer prior to any installation of the control system.

MATERIAL REQUIREMENTS

I. General. All materials shall be new. Certified material test reports shall be available to the Engineer or Owner upon request. Seal weld and make watertight all compartments; do not include access ports in the skin plate.

II. Carbon Steel. The gate shall be manufactured using structural carbon steel. The type and grade of the steel shall be verified by the gate manufacturer as suitable for the application. The steel for the upstream and downstream skin plates and diaphragm plates shall be arranged to form a rigid cellular type construction. Curved plates (if required by design) shall be pressure vessel quality conforming to ASTM A516, Class 70. The remainder of the gate shall be constructed of ASTM A36 steel or ASTM A572 Grade 50 (or stronger material as required by analysis). Structural tubing shall conform to ASTM A501

III. Stainless Steel. Stainless steel plate shall be ASTM A167 Type 304.

IV. Fixed Steel Hinges. The gate shall be supported by and rotate on fixed steel hinges mounted to the concrete structure. The bracket shall be anchored to the concrete structure in a manner to allow adjustment in three orthogonal planes during erection of the gate. The anchor bolts shall be stainless steel.

V. Bolts. High strength bolts used in the gate fabrication shall meet ASTM A325 or ASTM A490 as required by design and shall be hot dip galvanized in accordance with ASTM A153. If necessary to manufacturer and ship the gate in multiple sections, the joint(s) between the sections shall be machine flanged and bolted using high strength fasteners or shall be welded with complete penetration welds.

VI. Seals. The side seals shall be designed to seal the gate in all positions between fully raised and fully lowered. The seals shall be attached to the ends of the gate and shall be a fluorocarbon clad neoprene material. The seal attachment shall allow for replacement of the seals without the removal of the gate. The seals shall be installed to allow a minimum preset against the sealing surface. The gate seals shall be mounted on machined bars and shall be

held in place with clamping bars and stainless steel fasteners. The support members shall be connected to the structure in a manner to allow adjustment during erection.

VII. Side Seal System.

A. The side seal system shall be composed of stainless steel plates embedded into the concrete side walls.

B. A heating system to prevent ice from forming on the embedded side seal system is required.

VIII. Packing Box. The packing box shall be fabricated of stainless steel and cast into the concrete structure. Configuration shall allow for ease of maintenance and addition or replacement of packing material, if necessary. Packing material shall be impregnated with a non-migrating stable lubricant. Leakage through packing box shall be minimal. Leakage rate shall not exceed one gallon during any 24 hour period.

IX. Gate Supports. When the gate is in the fully lowered position, the weight of the gate shall be supported by adjustable gate stop contact pads located on the downstream surface of the training structure.

X. Paint.

A. Exposed Steel Surfaces. The outside of the gate, brackets, exposed surfaces of the side and bottom seal members, and other parts subjected to the elements shall be blast cleaned to the requirements of SSPC SP10 "near-white blast cleaning", and coated with a urethane free coating including, but not limited to, the following coating systems:

1. TNEMEC: Pota-Pox Plus; Series N140, 2 coats, 4-6 mils each.
2. Carboline: Carboguard 690 GF, 2 coats, 6-8 mils each.

B. The Contractor shall be responsible for holiday testing of all welded seams on all painted surfaces of the gate in the presence of the Engineer. Any holidays detected will be brush repaired.

C. The Contractor shall provide 1 gallon of touch up paint to the owner.

D. Surfaces Not Painted. Surfaces such as steel embedded in concrete, inside of gate compartments, stainless steel, bronze, machined surfaces and other corrosion resistant material shall not be painted. Machined steel surfaces shall receive rust inhibiting grease coating. Seal weld edges of surfaces forming compartments.

CONSTRUCTION REQUIREMENTS

I. CONSTRUCTION SEQUENCE

A. A conceptual construction sequence is included in the Drawings. The conceptual construction sequence presented is one possible sequence of construction. The sequence presented is not intended to direct the Contractor how to specifically construct the work,

but only to indicate an acceptable gate installation sequence. The Contractor is allowed to use their own experience and equipment preferences to achieve the required results.

B. Deliveries and access to the project shall be accomplished by the access road indicated on the drawings.

II. GATE FABRICATION

A. Steel Fabrication and Workmanship. Fabrication of all structural steel parts shall conform to the requirements of American Institute of Steel Construction, and Steel Construction Manual specifications. Surface finishes shall be indicated on the manufacturer's shop drawings in accordance with ANSI Standards. Gate and associated components shall be fabricated for convenience of shipment and field erection. All major components shall have lifting eyes or lugs to facilitate handling during off loading and erection. Acceptable lifting points shall be located and indicated on the erection drawings to be used by the Contractor.

B. Welds. Fabrication and inspection of all welds shall be in accordance with American Welding Society AWS D.1.1. All welding, weld procedures, and welder qualifications shall be in accordance with AWS D1.1. All welds shall be made only by qualified welders. All welds shall be visually inspected to the requirements of AWS D1.1. The welds joining the upstream and downstream skin plates to each other and to the vertical rib plates shall be tested using magnetic particle inspections and tested for 100 percent of the length of weld.

C. Shop Assembly and Testing. The gate shall be completely assembled in the shop and tested for functionality. Fixed hinges shall be assembled to the gate at their respective locations and the gate shall be rotated through its full range of operating swing. The gate shall be checked for dimensions, tolerances, accuracy of alignment and squareness before being shipped to the project site. Before disassembly, each part shall be match-marked and identified in accordance with the erection drawings. Such marking shall be done to retain its legibility until field erection is complete. The manufacturer shall make a record of the shop measurements of all critical dimensions that may affect the field erection and alignment or the operation and maintenance of the equipment. This record shall be included as part of the operation and maintenance manual.

D. Quality Control Program. The gate manufacturer shall have in effect at all times a Quality Control program that clearly establishes the authority and responsibility of those individuals to the Quality Control program. Persons performing quality functions shall have sufficient and well defined responsibility and authority to enforce quality requirements, to identify, initiate, recommend and provide solutions to quality problems to verify the effectiveness of the solutions.

III. GATE INSTALLATION

A. The gate shall be installed in accordance with the manufacturer's erection drawings and installation instructions. The gate shall be installed true and in alignment to prevent binding. The gate manufacturer shall prepare a written detailed procedure for the erection and installation of the gate and gate equipment. The installation procedure shall include the sequence of steps necessary for installation, precautions to be taken, description of adjustments to be made and tolerances to be maintained.

B. Finalize connections to the concrete structure after proper alignment of the gate is achieved.

C. The gate manufacturer shall provide support to the Contractor of an experienced erection advisor of the manufacturer during installation, final adjustment and testing of the gate. The erection advisor shall be available on-site as a minimum for the following events:

1. Construction planning meeting to be held prior to shipment.
2. After placement of the embedments and prior to assembly of the bearing brackets and leaves.
3. During erection of the gate sections.
4. During trial "dry operation" of the assembled gates; prior to finalizing connections to the existing structure.

D. The erection advisor shall furnish a signed statement that the final installation and start-up of the gate has been completed, witnessed and complies fully with the manufacturer's warranty requirements.

E. The erection advisor shall also instruct the Department's operating staff members in the operation and maintenance of the equipment.

IV. FIELD OPERATIONAL TESTS

A. After the installation is complete, the gate and operating systems shall be tested under the direction of the erection advisor. The gate shall be operated through all modes of operation, testing all monitoring and control functions. All necessary adjustments shall be made and the assembly shall be retested. The gate position sensing equipment shall be calibrated according to the manufacturer's instructions such that the system accuracy of true position is +/- ¼ inch. The gate shall be continuously operated through a minimum of three full cycles under no load. Binding of any type will require the system to be adjusted and retested. The HPU fluid temperature shall be monitored at 5 minute intervals over the entire test. If the fluid temperature exceeds the manufacturer's recommendation, the HPU shall be modified and a complete retest shall be performed.

B. The workmanship in the fabrication and installation of the gates shall be such that the gates in all positions shall form a watertight barrier across the opening.

C. The Contractor shall make all necessary adjustments, repairs or replacements to correct defects.

V. ACCEPTANCE OF WORK

A. The Engineer will observe the gate installation and operability and provide the Contractor a list of defects to be corrected before acceptance of the work. The Contractor shall operate the gate throughout its full operating range a sufficient number of times (no less than three) to demonstrate proper operation. Upon successful completion of the testing, acceptance of the work will be issued.

B. The gate unit must be accepted by the Owner. Final acceptance of the gate and related systems will be done at the conclusion of all the work.

VI. OPERATION AND MAINTENANCE MANUAL

A. Instructions. The gate manufacturer shall provide a detailed Operating and Maintenance and Procedures Manual for the Department's use. The manual shall completely describe gate operation procedures with applicable figures of reduced sized drawings, applicable parts list, catalogs that cover all equipment furnished and that may be needed or useful in the operation, maintenance, repair, dismantling or assembling, and for repair and identification of parts for ordering replacements. The manual shall provide the procedures and sequence to install the maintenance support braces in order to perform repairs to the gate.

B. Maintenance. The manual shall describe the recommended maintenance items (minor and major), schedule and interval to be performed on the gate. A troubleshooting chart, maintenance timetable, and lubrication diagrams shall be provided. This maintenance schedule shall include, but not be limited to:

1. Monthly. Such as visual inspection of structural, mechanical and electrical components, lubrication and power supply operation.
2. Quarterly. Such as gate full cycle operation.
3. Annual Maintenance. Such as lubricant testing, filter replacement, housekeeping.
4. Five Year Maintenance. Such as in depth structural, mechanical and electrical inspection, hydraulic fluid replacement, perform minor repairs as required.
5. Twenty Year Rehabilitation. Such as replacement/modification of control system to replace obsolete components and cabling, minor structural repairs and rehabilitation of the hydraulic cylinder/power supply.

C. Products. The acceptable products shall be listed and identified within the manual to be used during maintenance or repair periods. Item and/or part numbers from acceptable manufacturers shall be included. All catalog pages shall be marked to show the model number selected for each item of equipment.

D. Training. Prior to acceptance of the gate by the Owner, the gate manufacturer or Contractor shall provide on-site field training for the Department's operations and maintenance staff to operate the gate and to install the maintenance support braces. Training shall cover all pieces of the gate and shall include items contained in the operation and maintenance manual.

VII. SPECIAL WARRANTY

A. The Contractor shall provide a minimum 5-year non pro-rated warranty for the gate system, including the gate leaf, torque tube, bearings, packing box and seals, hydraulic cylinder, hydraulic power unit, valves and controls that initiates upon final acceptance of the gate by the Owner. This shall guarantee the installation as well as the materials and equipment to be free from defects of material and workmanship. During this period, Contractor shall be responsible for making any and all repairs or replacing any and all parts as necessary to restore the proper functioning of the gate. Contractor may arrange for annual, or more frequent, inspections of the installation during this warranty period.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

HINGED CREST GATES shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

HINGED CREST GATES shall be paid for at the contract lump sum price, including, but not limited to, all labor, material, and equipment required for design, fabrication, delivery, installation, testing, training, or other incidental items as shown on the plans.

END OF SPECIAL PROVISION – HYDRAULICALLY OPERATED HINGED CREST GATE

INSTRUMENTATION AND CONTROL SURGE PROTECTION DEVICES (SPD'S)

GENERAL

I. SUMMARY

A. Section Includes:

1. Dedicated 120 Vac circuit, series connection, control panel mounted.
2. Discrete 120 Vac control signal, control panel mounted.
3. Analog instrumentation signal, control panel mounted.
4. Discrete low voltage control signal, control panel mounted.
5. Data line, control panel mounted.

II. Quality Assurance

A. Referenced Standards:

1. Institute of Electrical and Electronics Engineers, Inc. (IEEE):

a. C62.41, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.

2. National Electrical Manufacturers Association (NEMA):

a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
b. LS 1, Low Voltage Surge Protection Devices.

3. Underwriters Laboratories, Inc. (UL):

a. 497B, Standard for Safety Protectors for Data Communications and Fire-Alarm Circuits.
b. 1283, Standard for Safety Electromagnetic Interference Filters.
c. 1449, Standard for Safety Transient Voltage Surge Suppressors.

B. Qualifications:

1. Provide devices for a manufacturer who has been regularly engaged in the development, design, testing, listing and manufacturing of SPDs of the types and ratings required for a period of 10 years or more and whose products have been in satisfactory use in similar service.
2. Upon request, suppliers or manufacturers shall provide a list of not less than three (3) customer references showing satisfactory operation.

III. Definitions

A. Clamping Voltage: The voltage measured at the end of the 6 IN output leads of the SPD and from the zero voltage reference to the peak of the surge when the applied surge is induced at the 90 degree phase angle of the applied system frequency voltage.

B. Let-Through Voltage: The voltage measured at the end of the 6 IN output leads of the SPD and from the system peak voltage to the peak of the surge when the applied surge is induced at the 90 degree phase angle of the applied system frequency voltage.

C. Maximum Continuous Operating Voltage (MCOV): The maximum steady state voltage at which the SPD device can operate and meet it specification within its rated temperature.

D. Maximum Surge Current:

1. The maximum 8 x 20 microsecond surge current pulse the SPD device is capable of surviving on a single-impulse basis without suffering either performance degradation or more than 10 percent deviation of clamping voltage at a specified surge current.
2. Listed by mode, since number and type of components in any SPD may vary by mode.

E. Protection Modes: This parameter identifies the modes for which the SPD has directly connected protection elements, i.e., line-to-neutral (L-N), line-to-line (L-L), line-to-ground (L-G), neutral-to-ground (N-G).

F. Surge Current per Phase:

1. The per phase rating is the total surge current capacity connected to a given phase conductor.
2. For example, a wye system surge current per phase would equal L-N plus L-G; a delta system surge current per phase would equal L-L plus L-G.

a. The N-G mode is not included in the per phase calculation.

G. System Peak Voltage: The electrical equipment supply voltage sine wave peak (i.e., for a 120 V system the L-N peak voltage is 170 V).

IV. Submittals

A. Product Data: submit manufacturer's published product data for all equipment.

B. Operation and Maintenance Manual.

V. Warranty

A. The manufacturer shall provide a minimum of a five (5) year Limited Warranty from date of shipment against failure when installed in compliance with applicable national/local electrical codes and the manufacturer's installation, operation and maintenance instructions.

CONSTRUCTION REQUIREMENTS

I. Dedicated 120 Vac SPD

A. Approved Products:

1. Cutler Hammer AGSHW CH-120N-15-XS.
2. EDCO HSP121BT-1RU.
3. MTL MA15/D/1/SI.
4. Phoenix Contact SFP 1-20/120AC (2856702).

B. Standards: UL 1449.

C. Design:

1. General:

   a. Mounted internally to control panels for point-of-use loads.
   b. MOV based or multi-stage hybrid solid state high performance suppression system.
   c. Designed for series connection.
   d. Enclosure: Metallic or plastic, flange or DIN rail mounting.
   e. Field connection: Provide unit with external terminal screws for each phase, neutral and ground that will accept #14 through #12 conductors.
   f. Device monitoring: Long-life, solid state, externally visible indicators that monitors the on-line status of the units suppression filter system or power loss in any of the phases.

2. Operating voltage: 120 Vac.
3. Operating current: 15 A minimum.
4. Operating frequency: 45 to 65 Hz.
5. Modes of protection: All modes, L-N, L-G and N-G.
6. Maximum continuous operating voltage: Less than 130 percent of system peak voltage.
7. Maximum surge current: 20,000A per phase, 10,000A per mode minimum.
8. Minimum repetitive surge current capacity: 1000 impulses with no degradation of more than 10 percent deviation of the clamping voltage.
9. Fusing: Optional integral unit level and/or component level short circuit and/or thermal overload protection.
   a. External protection as recommended by manufacturer.
10. Maximum clamping voltages, dynamic test with voltages measured from the zero voltage reference and 90 degree phase angle:

		IEEE C62.41		
System Voltage	**Test Mode**	**B Comb. Wave**	**A Ring Wave**	**UL 1449**
L-N=120V	L-N	400 V	300 V	330 V
	L-G	500 V	400 V	400 V
	N-G	500 V	400 V	400 V

11. EMI-RFI noise rejection: Attenuation greater than 30 dB for frequencies between 100 kHz and 100 MHz.

II. Discrete 120 Vac control signal SPD

A. Approved Products:

1. EDCO DRS-130RMS.
2. MTL MA-15/D/1/SI.
3. MTL SD-150X.
4. Phoenix Contact PT 2x1VA-120AC-ST (2839185) with PT BE/FM (2839282) base for non-isolated wiring.
5. Phoenix Contact PT-2 PE/S-120 AC-ST (2839334 with PT-BE/FM (2839282) base for isolated wiring.

B. Standards: UL 497B or UL 1449.

C. Design:

1. General:

    a. Mounted internally to control panels for point-of-use loads.
    b. Multi-stage hybrid solid state high performance suppression system.
    c. Designed for series connection.
    d. Enclosure: Metallic or plastic, flange or DIN rail mounting.
    e. Field connection: Provide unit with external terminal screws for each phase, neutral and ground that will accept #14 through #12 conductors.
    f. Device monitoring: Long-life, solid state, externally visible indicators that monitors the on-line status of the units suppression filter system or power loss in any of the phases.

2. Operating voltage: 120 Vac.
3. Operating current: 3 A minimum.
4. Operating frequency: 45 to 65 Hz.
5. Modes of protection: L-N; when ground conductor is present L-G and N-G.
6. Maximum continuous operating voltage: Less than 130 percent of system peak voltage.
7. Maximum surge current: 6000 A per phase, 3000A per mode minimum.
8. Minimum repetitive surge current capacity: The SPD shall meet one (1) of the following:

    a. 1000 occurrences of a 200A, 10x1000 microsecond waveform.
    b. 400 occurrences of a 500A, 10x1000 microsecond waveform.
    c. 100 occurrences of a 400A, 10x700 microsecond waveform.
    d. 100 occurrences of a 2000A, 8x20 microsecond waveform.

9. Maximum clamping voltages, measured from the zero voltage reference: The SPD shall meet one (1) of the following:

    a. 400A, 10x700 microsecond waveform: 200 percent of system voltage.
    b. IEEE B3 combination wave: 250 percent of system voltage.
    c. IEEE B3 ring wave: 200 percent of system peak voltage.
    d. IEEE A3 ring wave: 200 percent of system peak voltage.
    e. Mode N-G clamping voltage may be 175 percent higher than the L-G levels.

III. Analog instrumentation signal SPD

A. Approved Products:

1. Cutler Hammer DHW2P036.
2. EDCO DRS-036 or PC642C-036 with PCB1B base.
3. MTL SD32 or SD32X.
4. Phoenix Contact PT 2x2-24DC-ST (2838228) with PT 2x2-BE (2838208) or PT 2x2+F-BE (2839224) base.

B. Standards: UL 497B.

C. Design:

1. General:

a. Mounted internally to control panels for protection of equipment connected to analog signal loops.
b. Multi-stage hybrid solid state high performance suppression system.
c. Designed for series connection.
d. Enclosure: Metallic or plastic, flange or DIN rail mounting.
e. Field connection: The unit shall have external terminal screws for line and ground conductors.

2. Operating voltage: 24 Vdc or as indicated on the Drawings.
3. Modes of protection: All modes, L-L and L-G.
4. Maximum continuous operating voltage: Less than 130 percent of system peak voltage.
5. Maximum surge current: 10,000 A.
6. Minimum repetitive surge current capacity: The SPD shall meet one (1) of the following:

a. 1000 occurrences of a 200A, 10 x 1000 microsecond waveform.
b. 400 occurrences of a 500A, 10 x 1000 microsecond waveform.
c. 100 occurrences of a 400A, 10 x 700 microsecond waveform.
d. 100 occurrences of a 2000A, 8 x 20 microsecond waveform.
e. 10 occurrences of a 10,000A, 8 x 20 microsecond waveform.

7. Maximum clamping voltages, L-L: The SPD shall meet one (1) of the following:

a. 400A, 10x700 microsecond waveform: 400 percent of system voltage.
b. 10,000A, 8x20 microsecond waveform: 400 percent of system voltage.
c. IEEE B3 combination wave: 225 percent of system voltage.

8. Maximum clamping voltages, L-G: The SPD shall meet one (1) of the following:

a. 400A, 10x700 microsecond waveform: 200 percent of system voltage.
b. 10,000A, 8x20 microsecond waveform: 200 percent of system voltage.
c. IEEE B3 combination wave: 300 percent of system voltage.

IV. Discrete low voltage control signal SPD

A. Approved Products:

1. Cutler Hammer DDIN Series.
2. EDCO DRS Series.
3. MTL SD Series.
4. Phoenix Contact: PT Series.

B. Standards: UL 497B.

C. Design:

1. General:

   a. Mounted internally to control panels for protection of equipment connected to a discrete signal.
   b. Multi-stage hybrid solid state high performance suppression system.
   c. Designed for series connection.
   d. Enclosure: Metallic or plastic, flange or DIN rail mounting.
   e. Field connection: Provide unit with external terminal screws for line and ground conductors.

2. Operating voltage: 24 Vdc or 24 Vac or 120 Vac or as indicated on the Drawings.
3. Modes of protection: All modes:

   a. AC applications: L-N, L-G, N-G
   b. DC applications: Pos-Neg, Pos-Gnd, Neg-Gnd.

4. Maximum continuous operating voltage: Less than 130 percent of system peak voltage.
5. Maximum surge current: 10,000 A.
6. Minimum repetitive surge current capacity: The SPD shall meet one (1) of the following:

   a. 1000 occurrences of a 200A, 10 x 1000 microsecond waveform.
   b. 400 occurrences of a 500A, 10 x 1000 microsecond waveform.
   c. 100 occurrences of a 400A, 10 x 700 microsecond waveform.
   d. 100 occurrences of a 2000A, 8 x 20 microsecond waveform.
   e. 10 occurrences of a 10,000A, 8 x 20 microsecond waveform.

7. Maximum clamping voltages, L-L (Pos-Neg): The SPD shall meet one (1) of the following:

   a. 400A, 10x700 microsecond waveform: 400 percent of system voltage.
   b. 10,000A, 8x20 microsecond waveform: 400 percent of system voltage.
   c. IEEE B3 combination wave: 250 percent of system voltage.

8. Maximum clamping voltages, L-G: The SPD shall meet one (1) of the following:

   a. 400A, 10x700 microsecond waveform: 200 percent of system voltage.
   b. 10,000A, 8x20 microsecond waveform: 200 percent of system voltage.

c. IEEE B3 combination wave: 300 percent of system voltage.

V. Data line SPD

A. Approved Products:

1. Cutler Hammer DHW2P Series.
2. EDCO PC642 Series.
3. MTL SD Series.
4. Phoenix Contact: PT Series.

B. Standards: UL 497B.

C. Design:

1. General:

a. Mounted internally to control panels for protection of equipment connected to data lines (RS485, RS232, telephone line, etc.).
b. Multi-stage hybrid solid state high performance suppression system.
c. Designed for series connection.
d. Enclosure: Metallic or plastic, flange or DIN rail mounting.
e. Field connection: Provide unit with external terminal screws for line and ground conductors.

2. Operating voltage: Nominal unit operating voltage and configuration as specified or as indicated on the Drawings.
3. Modes of protection: All modes.
4. Maximum continuous operating voltage: Less than 130 percent of system peak voltage.
5. Maximum surge current: 10,000 A.
6. Minimum repetitive surge current capacity: The SPD shall meet one (1) of the following:

a. 1000 occurrences of a 200A, 10 x 1000 microsecond waveform.
b. 400 occurrences of a 500A, 10 x 1000 microsecond waveform.
c. 100 occurrences of a 400A, 10 x 700 microsecond waveform.
d. 100 occurrences of a 2000A, 8 x 20 microsecond waveform.
e. 10 occurrences of a 10,000A, 8 x 20 microsecond waveform.

7. Maximum clamping voltages, L-L (Pos-Neg): The SPD shall meet one (1) of the following:

a. 400A, 10x700 microsecond waveform: 400 percent of system voltage.
b. 10,000A, 8x20 microsecond waveform: 400 percent of system voltage.
c. IEEE B3 combination wave: 250 percent of system voltage.

8. Maximum clamping voltages, L-G: The SPD shall meet one (1) of the following:

a. 400A, 10x700 microsecond waveform: 200 percent of system voltage.
b. 10,000A, 8x20 microsecond waveform: 200 percent of system voltage.

c. IEEE B3 combination wave: 300 percent of system voltage.

VI. SOURCE QUALITY CONTROL

A. Performance tests to be performed or independently verified by a certified testing laboratory.

B. The SPD are to be tested as a complete SPD system including: Integral unit level and/or component level fusing.

CONSTRUCTION REQUIREMENTS

I. INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Dedicated 120 Vac Circuit SPD:

1. Provide on the following applications:

a. Incoming 120 V power to all control panels.
b. Load side of 120 V power terminals to external equipment supplied from control panel.

2. Connected in series with the panel's or equipment's branch circuit.
3. Provide fuse protection as recommended by manufacturer.
4. Flange mount or DIN rail mount in control panel.
5. Connect all SPDs in the panel to the same grounding point.

C. Discrete 120 Vac Control Signal SPD:

1. Provide on the following applications:

a. 120 V discrete PLC signals into a control panel from float switches, position switches, etc., where the device is mounted outdoors or in a remote building or structure from the control panel and where the control conductors are routed above grade or underground.
b. 120 V discrete PLC signals into a control panel from float switches, position switches, etc., where both the device and control panel are mounted outdoors and the control conductors are routed above grade or underground.

2. Connected in series with the equipment.
3. Provide fuse protection as recommended by manufacturer.
4. Flange mount or DIN rail mount in control panel.
5. Connect all SPDs in the panel to the same grounding point.

D. Analog Instrumentation Signal SPD:

1. Provide on the following applications:

a. Incoming 4-20mA signals into a control panel from transmitters (flow, level, etc.) where the transmitter is mounted outdoors or in a remote building or structure from the control panel and the signal conductors are routed above grade or underground.
b. Incoming 4-20mA signals into a control panel from transmitters (flow, level, etc.) where both the transmitter and control panel are mounted outdoors and the signal conductors are routed above grade or underground.

2. Connect in series with the equipment.
3. Flange mount or DIN rail mount in control panel.
4. Connect all SPDs in the control panel to the same grounding point.
5. Verify SPDs series resistance and capacitance does not interfere with the transmitters signal.

E. Discrete Low Voltage Control Signal SPD:

1. Provide on the following applications:

a. Low voltage (e.g., 24 Vac, 24 Vdc) discrete {PLC} {RTU} {DCS} signals into a control panel from float switches, position switches, etc., where the device is mounted outdoors or in a remote building or structure from the control panel and where the control conductors are routed above grade or underground.
b. Low voltage (e.g., 24 Vac, 24 Vdc) discrete {PLC} {RTU} {DCS} signals into a control panel from float switches, position switches, etc., where both the device and control panel are mounted outdoors and the control conductors are routed above grade or underground.

2. Connect in series with the equipment.
3. Flange mount or DIN rail mount in control panel.
4. Connect all SPDs in the control panel to the same grounding point.

F. Data Line SPD:

1. Provide on the following applications:

a. On both ends of data lines that interconnect devices that are locked outdoors or in remote buildings or structures where the conductors are routed above grade or underground.

1) PLC network (e.g., RS-485).
2) Fieldbus (e.g., Profibus).
3) Telephone modem.

2. Connect in series with the equipment.
3. Flange mount or DIN rail mount in control panel.
4. Connect all SPDs in the control panel to the same grounding point.
5. Verify SPDs series resistance and capacitance does not interfere with the data line signal.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION – INSTRUMENTATION AND CONTROL SURGE PROTECTION DEVICES (SPD'S)

INTERIOR PAINTING

GENERAL

I. Section includes surface preparation and the application of paint systems on interior substrates at the Lockhouse and Gate Structure.

II. DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523. (Flat)

B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523. (Velvet)

C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523. (Eggshell)

D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523. (Satin)

E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523. (Semi-Gloss)

F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523. (Traditional Gloss)

G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523. (High Gloss)

III. ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. LEED Submittals:

1. Product Data for Credit EQ 4.2: For paints and coatings, including printed statement of VOC content.

C. Samples: For each type of paint system and in each color and gloss of topcoat.

D. Product List: For each product indicated. Include printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

IV. MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

V. QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Engineer will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
b. Other Items: Engineer will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Engineer at no added cost to Department.

VI. REFERENCES:

A. SSPC-SP 1 - Solvent Cleaning

B. SSPC-SP 2 - Hand Tool Cleaning

C. SSPC-SP 3 - Power Tool Cleaning

D. SSPC-SP 13 / Nace No. 6 Surface Preparation for Concrete

E. EPA-Method 24

F. GS-11 May 1993, GC-03, SCAQMD

MATERIAL REQUIREMENTS

I. MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company products, or comparable products by one of the following:

1. Glidden Professional.
2. PPG Pittsburg Paints.
3. Comex, Color Wheel.
4. Carboline Coatings.

II. PAINT, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such a procedure is specifically described in manufacturer's product instructions. VOC numbers need to be confirmed by using the products MSDS sheets.

C. 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.
2. 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.

D. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 150 g/L.
3. Dry-Fog Coatings: 400 g/L.
4. Primers, Sealers, and Undercoaters: 200 g/L.
5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Floor Coatings: 100 g/L.
9. Shellacs, Clear: 730 g/L.
10. Shellacs, Pigmented: 550 g/L.
11. Clear Wood Finishes (Varnish): 350 g/L.
12. Wood Stain: 250 g/L.

E. Colors: As selected by the Engineer from manufacturer's full range.

III. STEEL SUBSTRATES

A. Primer, Organic Zinc-Rich:

1. Carbozinc 859, organic Zinc-Rich Epoxy, Low VOC.

B. Finish Coat

1. Carbothane 8812

IV. WATER-BASED PAINTS

A. Primer:
1. S-W ProMar 200 Zero VOC Latex Primer, B28W2600 Series
2. S-W Premium Wall & Wood Primer, B28W8111

B. Latex, Interior, Flat,:

1. S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series

C. Latex, Interior, Low Sheen:

1. S-W ProMar 200 Zero VOC Latex Low Sheen Enamel, B24-2600 Series

D. Latex, Interior, Eggshell/Satin:

1. S-W ProMar 200 Zero VOC Latex Egg-Shell, B20-2600 Series

E. Latex, Interior, Semi-Gloss:

1. S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series

F. Latex, Interior, Gloss:

1. S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series

V. FLOOR COATINGS

A. Floor Enamel, Alkyd, (Gloss Level 3):

1. S-W Porch & Floor Enamel, A32-200 Series

a. Color: Gray.

CONSTRUCTION REQUIREMENTS

I. EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMU): 12 percent.
3. Wood: 15 percent.
4. Gypsum Board: 12 percent.
5. Plaster: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Do not begin application of coatings until substrates have been properly prepared. Notify Engineer of unsatisfactory conditions before proceeding.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

II. PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and 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.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. No painting should take place when the interior temperature is below 50°F unless the specified product is designed for the marginal conditions.

E. Concrete, SSPC-SP13 or NACE 6: This standard gives requirements for surface preparation of concrete by mechanical, chemical, or thermal methods prior to the application of bonded protective coating or lining systems. The requirements of this standard are applicable to all types of cementitious surfaces including cast-in-place concrete floors and walls, precast slabs, masonry walls, and shotcrete surfaces. An acceptable prepared concrete surface should be free of contaminants, laitance, loosely adhering concrete, and dust, and should provide a sound, uniform substrate suitable for the application of protective coating or lining systems.

F. Drywall—Interior: Must be clean and dry. All nail heads must be set and spackled. Joints must be taped and covered with a joint compound. Spackled nail heads and tape joints must be sanded smooth and all dust removed prior to painting.

G. Wood: Must be clean and dry. Prime and paint as soon as possible. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth.

III. APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

B. 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.

C. Apply coatings at spreading rate required to achieve the manufacturer’s recommended dry film thickness.

D. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

IV. CLEANING AND PROTECTION

A. 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 Engineer, and leave in an undamaged condition.

B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces following manufacturer's recommendation. Repair any defects that will hinder the performance of the coatings.

V. INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Traffic Surfaces:

1. Latex Floor Enamel System Satin Finish:

   a. 1st Coat: S-W Porch & Floor Enamel, A32-200 Series
   b. 2nd Coat: S-W Porch & Floor Enamel, A32-200 Series (4 mils wet, 1.4 mils dry per coat).

B. Vault Trolley Beams – Gate Structure:

1. Shop Coatings:
   a. Prime Coat – Carbozinc 859 (4 mils dry per coat)
   b. Finish Coat: Carbothane 8812 (5 mils dry per coat)

2. Field Touch Up:
   a. Prime Coat- Carbothane 8812 (4 mils dry per coat)
   b. Finish Coat – Carbothane 8812 (4 mils dry per coat)

C. Wood Substrates: Including wood trim and architectural woodwork and wood-based panel products.

1. Latex System for painted Wood:

   a. Prime Coat: S-W Premium Wall & Wood Primer, B28W8111 (4 mils wet, 1.8 mils dry.)
   b. 2nd Coat: S-W ProMar 200 Zero VOC Latex Egg-Shell, B20-2600 Series
   c. 3rd Coat: S-W ProMar 200 Zero VOC Latex Egg-Shell, B20-2600 Series (4 mils wet, 1.6 mils dry per coat.)

D. Gypsum Board Substrates:

1. Latex System:

   a. Prime Coat: S-W ProMar 200 Zero VOC Latex Primer, B28W2600 (4 mils wet, 1.5 mils dry.)

b. 2nd Coat: S-W ProMar 200 Zero VOC Latex Egg Shell, B20-2600 Series.

c. 3rd Coat: S-W ProMar 200 Zero VOC Latex Egg Shell, B20-2600 Series. (4 mils wet, 1.6 mils dry per coat)

BASIS OF PAYMENT

Interior painting will be included in the lump sum price for painting of each structure, LOCKHOUSE - PAINTING and GATE STRUCTURE - PAINTING.

END OF SPECIAL PROVISION – INTERIOR PAINTING

JOINT SEALANTS

GENERAL

Section Includes latex joint sealants for the Lockhouse, Lock Intake Structure, and the Gate Structure.

I. 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.

C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2 in. wide joints formed between two (2) 6 in. long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

E. Qualification Data: For qualified Installer.

F. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

H. Warranties: Sample of special warranties.

II. QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency:

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
2. Test 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.

D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

III. 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.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

IV. WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period:

1. Warranty Period: Two (2) years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period:

1. Warranty Period: Five (5) years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

V. MATERIALS, GENERAL

A. 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 joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):

1. Architectural Sealants: 250 g/L.

2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

D. Colors of Exposed Joint Sealants: As selected by Engineer from manufacturer's full range.

MATERIAL REQUIREMENTS

I. LATEX JOINT SEALANTS

A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF:

1. Products: Subject to compliance with requirements, provide one (1) of the following:

a. BASF Building Systems; Sonolac.
b. Bostik, Inc.; Chem-Calk 600.
c. Pecora Corporation; AC-20+.
d. Tremco Incorporated; Tremflex 834.

II. JOINT SEALANT BACKING

A. General: Provide sealant backings of material 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), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

III. 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.

IV. EXAMINATION

A. 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.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

V. 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:

1. 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.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by 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.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer 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.

VI. 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.

C. Install sealant backings of kind 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:

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs 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:

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193:

    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

VII. 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.

VIII. 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.

IX. JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Interior or exterior joints in vertical surfaces and horizontal nontraffic surfaces JS1:

1. Joint Locations:

    a. Perimeter joints between interior wall surfaces and frames of interior doors, and windows.

2. Joint Sealant: Latex.

3. Joint-Sealant Color: As selected by Engineer from manufacturer's full range of colors.

BASIS OF PAYMENT

The work described in this special provision will not be paid for as a separate item, but shall be included in the bid price for the various related items.

END OF SPECIAL PROVISION – JOINT SEALANTS

LANDSCAPING

DESCRIPTION

I. This work shall consist of landscaping planting beds as shown on the plans and specified below. Work shall include bed preparation, plants, mulching and maintenance of the plants after planting.

MATERIAL

I. Soil

A. Topsoil shall conform to Section 1081.05 of the Standard Specifications

II. Plants

A. All plant materials shall be in accordance with the American Standards for Nursery Stock.

B. Perennial plants

1. Lilies shall conform to Section 1081.02 of the Standard Specifications
2. Stella de Oro Daylilies – 1 gallon pots.

C. Shrubs and trees

1. Trees and shrubs shall conform to Section 1081.01 of the Standard Specifications
2. Blue Rug Juniper – 2 gallon pots.
3. Vicary Golden Privet – 3 gallon pots.
4. Wilson Boxwood – 2 gallon pots.
5. Denisformis Yew – 3 gallon pots.
6. Redbud – 5 gallon pots.

III. Mulch

A. Mulch shall consist of commercially available ground white cedar.

B. Weed Barrier Fabric shall conform to Section 1081 of the Standard Specifications

CONSTRUCTION REQUIREMENTS

I. Planting Bed Preparation

A. Planting beds shall have all unsuitable material removed to the depth of the bottom of the largest plant being planted.

B. The planting beds shall be filled with topsoil. The beds shall be settled with water to consolidate the topsoil.

C. The finished grade of the topsoil shall be 2 inches below the adjacent paving.

D. Remove any residual plants or weeds from the bed.

II. Perennial Planting

A. Excavate a hole slightly larger than the perennial pot and slightly shallower than the depth of the pot.

B. Score the outside of the root ball prior to planting.

C. Add a slow release starter fertilizer to the hole prior to planting the perennial.

D. Install the perennial in the hole and backfill tightly around the plant.

III. Shrub Planting

A. Excavate a hole two times the diameter of the root ball on the shrub. The invert of the hole shall be roughed up and at an elevation that places the top of the root ball 1-2 inches above the finished ground elevation.

B. Cut and score the outside of the root ball if the tree is root bound in the pot.

C. Add a slow release starter fertilizer to the hole prior to planting the shrub.

D. Install the shrub in the hole ensuring the top of the plant is 1-2 inches above the finished grade.

E. Backfill the hole with broken up top soil packing the soil against the root ball leaving no air voids.

IV. Tree Planting

A. Excavate a hole two times the diameter of the root ball on the tree. The invert of the hole shall be roughed up and at an elevation that places the top of the root ball 1-2 inches above the finished ground elevation.

B. Cut and score the outside of the root ball if the tree is root bound in the pot.

C. Backfill the hole with broken up top soil packing the soil against the root ball leaving no air voids.

D. Install two wooden stakes outside the excavation and stake the tree with nylon webbing for stability. The webbing shall be positioned 1/3 up the height of the tree.

V. Mulching

A. Once finish grade has been established around the planted perennials and shrubs, a layer of weed barrier fabric shall be placed on all areas to be mulched. Seams in the fabric shall overlap by 4 inches and the fabric shall be stapled down to prevent movement during the application of mulch.

B. Add three loose inches of cedar mulch to the planting bed. The mulch shall be wetted down after application to settle the layer.

VI. Plant Maintenance

A. Tree and Shrub plantings shall be maintained per Section 253.14 of the Standard Specifications.

B. Perennial plants shall be maintained per Section 253.14 of the Standard Specifications.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

LANDSCAPING shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

LANDSCAPING will be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to add topsoil to the planting beds, prepare the beds, plant the trees, shrubs and perennials, add weed fabric and mulch and provide ongoing maintenance for the period specified.

END OF SPECIAL PROVISION – LANDSCAPING

LIGHTING

GENERAL

I. Provision Includes:

A. Light fixtures to illuminate the interior and exterior of the building as shown on the Drawings.

B. Exterior lighting poles

C. Concrete pole bases.

II. References:

A. American National Standards Institute (ANSI):

1. ANSI C62.41 - Recommended Practice on Surge Voltages in Low Voltage AC Power Circuits.

B. American Society of Testing Materials (ASTM).

C. Certified Ballast Manufacturers Association (CBM).

D. Electrical Testing Laboratories (ETL).

E. Federal Communications Commission (FCC).

F. Illuminating Engineers Society (IES):

1. IES Lighting Handbook (Two Volume Set).

G. National Electrical Manufacturers Association (NEMA).

H. National Fire Protection Association (NFPA):

1. NFPA-70, National Electric Code (NEC).
2. NFPA-101, Life Safety Code.

I. Underwriters Laboratories (UL):

1. All fixtures and components to be UL listed.
2. Fixtures to be UL labeled for use in installed locations.

J. State of Illinois:

1. Illinois Steel Products Procurement Act, as amended.

IV. Quality Assurance

A. Allowable Tolerances:

1. Alignment:

   a. Fixture mounted in rows shall be arranged in straight lines as shown on Drawings.
   b. Suspended assemblies of fixtures shall be assembled squarely, with no deviation in alignment from fixture to fixture.
   c. Suspended fixtures in the same room or space shall all be at the same height unless specifically shown otherwise on Drawings.
   d. Area lighting poles shall be installed plumb and level.

2. Orientation: Unless specifically shown or noted otherwise on Drawings, all fixtures in the same room or space, no matter what type, are to be oriented in the same direction

B. Fixtures shall be located where shown on the electrical lighting plans. Where a fixture is shown in conflict with other equipment located on or above the ceiling, the following shall apply:

1. Recessed fixtures in lay-in ceilings shall have highest priority over all other equipment, no matter what is installed first.
2. Suspended or surface mounted fixtures shall have the lowest priority, no matter what is installed first.
3. Contact Engineer if conflict cannot be resolved from above. Do not proceed with any of the conflicting work until Engineer issues written instructions.

C. Deviations from Fixture Schedule:

1. Fixture descriptions and acceptable products listed in the Fixture Schedules on the drawings are the basis for determining fixture quality.
2. Deviations from the Fixture Schedule will only be considered if Contractor follows the formal product substitution procedure for the project. Alternate fixtures included in submittals that have not been proposed formally as a product substitution may be rejected by Engineer without review.
3. Proposed substitute fixtures shall, at a minimum, meet all the listed requirements of the fixture as listed in the fixture schedule. Fixtures that do not meet any of the requirements of the fixture schedule will not be considered as a substitution.
4. Contractor shall make arrangements with the proposed substitute fixture manufacturer to provide a sample to the Engineer for inspection upon request.

   a. The Engineer's local manufacturer's representative may provide samples for inspection in lieu of the Contractor's fixture supplier.
   b. Samples will be returned to the manufacturer after inspection.

5. Contractor shall base his bid price on fixtures as listed in the fixture schedule.

   a. No additional compensation for the Contractor will be considered if a proposed substitute fixture is not allowed on the project.

b. Engineer may, as a condition of accepting a substitute fixture for use on the project, require that a deduct change order be issued by the Contractor if, in the Engineer's opinion, use of the substitute fixture provides a significant cost savings or significantly reduces the value of the project over the fixture listed in the Fixture Schedule.

V. Submittals

A. Shop Drawings

1. Submit detailed drawings to scale of special fixture layouts where multiple fixtures are joined together to form a single assembly.
2. Submit detailed drawings of all fixture mountings, showing attachment points, clearances, and special accessories.

B. Product Data:

1. Provide manufacturers' catalog cuts for all fixtures. Where multiple fixture models are shown on one sheet, identify clearly the model or models to be used. List complete fixture number indicating all accessories and options to be provided with fixtures.
2. Submit manufacturers' catalog cuts for all ballast/lamp combinations. Ballast data must show compatible lamps, starting temperature and operating current. Lamp cuts must show wattage, configuration, color temperature and CRI.
3. LED fixture data shall identify:

   a. Drive current (mA)
   b. Color temperature and CRI
   c. End of life lumen depreciation.

C. Operating and Maintenance Data:

1. Submit manufacturers standard maintenance manual for all equipment.
2. Manual should include operating procedures, troubleshooting guide, recommended maintenance schedule, testing schedule, and complete spare parts list.

D. Warranties: Submit copies of manufacturers' standard warranty for all items

VI. Delivery, Storage And Handling

A. Materials shall be suitably packaged by manufacturer to prevent damage during shipment. Damaged materials will not be acceptable for installation.

B. Store materials on site in clean, dry storage area. When outside, store elevated above grade and enclosed in durable, watertight wrapping.

C. Store electronic components protected from weather extremes. Do not exceed the electronics' storage humidity and temperature ratings. Allow components to stabilize if moved between wide temperature ranges prior to installation.

D. Handle all materials carefully to prevent damage. Minor scratches, marks or blemishes to finish shall be repaired to the satisfaction of the Engineer.

VII. Warranties And Bonds

A. Contractor's Warranty: One year in accordance with the General Conditions.

B. Manufacturers' Warranties: In accordance with the General Conditions:

1. Two years on electromagnetic ballasts.
2. Five years minimum on fluorescent electronic ballasts.
3. Five years minimum on electronic LED drivers.
4. One year for all other items.

MATERIAL REQUIREMENTS

I. Interior And Exterior Luminaires

A. UL listed for installed location.

B. Provided with all necessary hardware and accessories for the mountings detailed on drawings.

C. Internal fixture wiring to be in compliance with NEC.

D. Acceptable Products: As listed in Fixture Schedule on drawings.

II. Ballasts And Drivers

A. Electronic Fluorescent Ballasts:

1. UL listed, CBM approved, Class P protected.
2. High power factor type, with less than 10% THD.
3. Same wiring connections as electromagnetic ballasts.
4. Solid-state, discrete or integrated circuit type, with an output frequency of 20 kHz or higher.
5. Certified as meeting FCC Part 18 for EMI.
6. Capable of withstanding an ANI C62.41, category a waveshape without damage.
7. Have a minimum starting temperature of 50°F.

B. Electronic LED Drivers:

1. UL listed.
2. High power factor type, with less than 10% THD.
3. Solid-state, discrete or integrated circuit type.
4. Certified as meeting FCC Part 18 for EMI.
5. Capable of withstanding an ANI C62.41, category a waveshape without damage.

III. Lamps

A. Fluorescent Lamps:

1. Size, Shape, and Wattage as listed in Fixture Schedule on Drawings.
2. 2700 K color temperature and minimum 69 CRI.
3. All lamps by same manufacturer. All lamps in similar locations shall have same color temperature and CRI.

B. Acceptable Manufacturers:

1. General Electric.
2. Philips.
3. Sylvania/Osram.

IV. LED Luminaires

A. LED Color temperature:

1. Interior fixtures: 3500K
2. Exterior fixtures: 5000K

B. Minimum 82 CRI.

C. No more than 80% lumen depreciation at 50,000 hrs.

D. Provided with electronic driver matched to LED's.

V. Exterior Area Lighting Poles

A. Construction:

1. Aluminum Poles:

a. Shaft shape: tapered.
b. Pole cross section: square.
c. Pole height: as noted in Luminaire Schedule on drawings.
d. Finish: Dark bronze to match luminaires to be mounted on pole.

B. Provided with all necessary hardware and accessories for fixture mountings shown on drawings.

C. Anchor bolts:

1. Shall have minimum 55,000 psi yield strength.
2. Galvanized per ASTM-A153.

D. Pole base shall have minimum 35,000 psi yield strength, continuously welded to bottom of pole.

E. Pole shall be designed to withstand a wind pressure loading for a 100 mph velocity wind.

F. Provided with a removable shroud over base plate, secured with tamper-proof screws.

G. Pole shall contain an integral hand hole, sized per NEC requirements.

1. Grounding lug shall be provided inside pole, accessible from handhole.
2. Provided with a weathertight coverplate secured with tamper-proof screws.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Mount all equipment per manufacturer's recommendations.

B. Install fixtures so as not to be hidden or obstructed by any pipes, ducts, or other equipment hanging below.

C. Where interference prohibits installation of fixtures as shown, contact Engineer immediately for resolution. Do not proceed with fixture installation in affected space until instructed by Engineer.

D. Install fixtures so that doors or louvers can be opened or removed without obstruction.

E. Lenses and Louvers shall not be installed in fixtures until space has been finished and cleaned. Clean entire fixture, including lamps and reflectors, prior to installing lenses or louvers.

F. Surface Mount Fixtures:

1. Rigidly attached to surface with mounting hardware appropriate for construction.
2. Fixtures shall not be solely supported from outlet box unless box is integral part of fixture and designed for such mounting.
3. Fixtures less than two feel wide shall have supporting points centered across width of fixture. Wider fixtures to have supporting points along each edge of fixture.
4. Fixtures shall be supported from each end. Provide additional supporting points at four-foot maximum intervals.

II. Application

A. Fluorescent Fixtures shall be provided with ballast capable of operating lamps down to the minimum expected temperature of the installed location.

B. Compatibility:

1. Contractor shall be responsible for determining that ballasts provided with fixtures are appropriate for the location and lamps installed.
2. Contractor shall be responsible for determining that the indicated lamps will fit the sockets provided with the fixture.
3. Contractor shall provide, at his own expense, any modifications necessary to provide proper compatibility.

III. Exterior Area Lighting Poles:

A. Reinforced concrete bases shall be provided as detailed on drawings.

B. Anchor bolts shall be arranged in base per manufacturers' template.

C. Use leveling nuts to plumb pole securely in place.

D. Provide in-line fuse holder and fuse, accessible from handhole.

E. Grounding:

1. Provide ground rod for each pole, located adjacent to concrete base.
2. Bond ground rod to pole with minimum #10 AWG bare copper ground electrode conductor.
2. Connect all ground conductors together inside pole and bond to pole grounding lug.

IV. Field Quality Control

A. Fixtures installed prior to the finishing of a space shall be protected from damage.

B. Fixtures which require aiming shall be aimed by Contractor. Exterior fixtures shall be aimed at night.

C. Fixtures shall be checked for proper alignment.

1. Lenses and louvers shall set squarely into fixture.
2. Doorframes shall be square and operate freely.
3. Lamps shall be properly seated into sockets.
4. Trim rings shall sit flush against ceiling.

D. Interior fixtures with ballasts shall be checked for excessive noise. Contractor shall replace any ballasts or fixtures that are noisy.

E. Prior to Final Acceptance:

1. All failed lamps and ballasts shall be replaced.
2. All fixtures shall be cleaned of dirt, dust, paint, debris, etc., including lamps and reflectors.
3. All lenses and other accessories shall be installed on fixtures.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – ELECTRICAL WORK as shown on the Electrical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

3. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – ELECTRICAL WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

3. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION LIGHTING

LOCK GATE METAL CASTINGS

DESCRIPTION

This Work shall consist of the furnishing and installing lock miter gate castings in accordance with the Drawings and Specifications, including the pintle lower part, pintle center part, pintle upper part, gudgeon, and lower gate quoin bearing plates.

MATERIAL REQUIREMENTS

I. Steel Castings

A. Steel castings shall conform to the requirements of ASTM A27, Grade 70-40. ASTM A781 supplementary requirements S4 (Ultrasonic Examination), S6 (Certification), S8 (Marking), and S12 (Test Report) shall be included. The grade shall be as specified on the Drawings.

B. The dimensional tolerances of the finished casting as compared to the plan dimensions shall be in accordance with the following table unless otherwise specified in the Drawings:

Plan Dimension	Tolerances	
Up to 1 inch	+1/16 inch	-1/32 inch
Over 1 inch to 3 inches, incl.	+1/8 inch	-1/16 inch
Over 3 inches to 7 inches, incl.	+1/8 inch	-1/8 inch
Over 7 inches to 20 inches, incl.	+1/4 inch	-1/8 inch
Over 20 inches to 98 inches, incl.	+1/4 inch	-1/4 inch
Over 98 inches	+1/2 inch	-1/4 inch

C. Machined dimensions shall meet the tolerances called for on the approved working Drawings.

D. Test specimens shall show a fracture having a silky or fine granular structure throughout.

E. Castings shall be true to pattern in form and dimensions, with rounded corners, and all inside angles shall have ample fillets.

F. All castings shall be free of pouring faults, sponginess, cracks, cold shunts, shrink holes, and porosity.

G. All castings shall be cleaned, and free of loose scale and sand, fins, seams, gates, risers, and other irregularities.

H. Blow holes and other defects appearing upon finished castings shall be so located that a straight line laid in any direction will not cut a total length of defect at a ratio greater than 1/2 inch in any 1 ft, nor shall any single defect exceed 1/2 inch in any dimension, or have an area greater than 1/4 square inch. Defects shall not have a depth greater than 10% of the actual wall thickness but in no case greater than 1/4 inch.

I. Castings with any defects, or accumulation of defects, which impair the strength or machineability of the casting, as determined by the Engineer, shall be rejected.

J. Minor defects which do not impair the strength or serviceability of the casting may, with the prior approval of the Engineer, be repaired by an approved procedure. The defects shall be fully described with non-destructive test reports, sketches, photographs, and metallurgical test reports, as the case may warrant, and submitted with the proposed repair procedure for review and approval, by the Engineer, prior to any repairs. The defects shall be removed to sound metal by drilling, grinding, or air-carbon arc gouging followed by grinding. After welding, the castings shall be heat treated again if required by the approved repair procedure.

K. Castings which have been, or are being repaired without prior approval of the repair procedure shall be rejected.

L. Large castings may be subjected to non-destructive tests if required by the Contract Documents, the approved weld repair procedure, or to determine the extent of defects.

M. An identification number, as assigned by the Department, shall be scribed into the casting by the manufacturer, on a non-wearing surface that does not affect the strength of the casting.

N. The center of rotation shall be permanently scribed into the top and bottom surface of the pintle by the pintle manufacturer.

II. Inspection and Testing

A. Visual: Castings shall be visually inspected by the Contractor at the foundry after they are cleaned, after heat treatment, and after any repairs made to the casting.

B. Ultrasonic: All castings shall be ultrasonically tested in accordance with ASTM A609, Procedure A, Quality Level 3. Castings that do not meet this test will be rejected. Test results, whether positive or negative, shall be submitted to the Engineer.

C. The hardness shall be tested at three random locations in the crowned top surface of each new pintle. Any casting that has a Brinell hardness number that is 5% greater or 5% lower than average for the mating casting shall be rejected.

III. Patterns

A. Patterns shall be furnished by the Contractor. Following construction, the pattern shall become the property of the Department, and shall be furnished with an appropriate storage container as determined by the Engineer.

B. The pattern shall be constructed of a "Select" grade of mahogany, kiln dried, coated with three (3) coats of varnish, and rubbed down for a smooth finish. If the pattern is constructed of multiple pieces of wood, the contact surfaces shall be cleaned of all dust and other foreign material prior to joining. The varnish and any glue used in the fabrication of the pattern shall be suitable for long term storage in an unheated and humid environment. The dimensions of the pattern shall take into account the shrinkage and machining of the casting. The pattern shall also meet the appropriate standard established

by the Bureau of Standards, the American Foundrymen's Association, the Steel Founder's Society of America, or the Malleable Iron Research Institute.

IV. Core Boxes

A. Any core boxes required to make the casting shall be furnished by the manufacturer.

B. The core boxes, patterns, and storage containers shall be delivered to the Department in good condition, as determined by the Engineer, as soon as the patterns are no longer needed.

C. Any defective core boxes, patterns, or storage containers shall be repaired or replaced by the Contractor, to the satisfaction of the Engineer, at no cost to the Department.

V. Quoin Block Filler Material

A. The existing lower miter gate, once relocated to the new miter gate monolith and adjusted to the acceptance of the Engineer, will require installation of Epoxy Grout between the W10 Quoin Post and cast bearing plate. The Epoxy Grout shall be "Redbac High Performance Grout K-009 Epoxy Filler used for Lock/Dam Backing", or approved equal.

VI. Long Lead Items

A. The Contractor is advised that castings are potential long-lead items for procurement. The Contractor's schedule shall provide sufficient time for fabrication and delivery of castings to avoid delays in progressing Work.

CONSTRUCTION REQUIREMENTS

I. Submittals

A. Provide written procedure identifying the steps, sequence, equipment, and methods of aligning and performing casting installation, including, but not limited to, measures to prepare and install bearing block grout, methods to drill casting anchors and bolts in accordance with tolerances specified herein, and methods of positioning, leveling, and casting embedded components into place (within second stage concrete placements).

II. Shop Drawings

A. Shop drawings showing all details necessary for fabrication and installation of miscellaneous metal items shall be submitted to Engineer for review. Fabrication and erection shall not be started until shop drawings have been accepted by Engineer.

III. Finishing

A. Dimensions of machined parts are the finished dimensions after fabrication and machining. Unless otherwise specified, all dimensions for machine finished surfaces and

parts shall be held within a tolerance of 0.01 in. Provide finishes as designed on the plans in accordance with ANSI roughness requirements.

IV. Painting

A. Exposed Steel Surfaces that are not finished and are subjected to the elements shall be blast cleaned to the requirements of SSPC SP10 "near-white blast cleaning", and coated with a urethane free coating including, but not limited to, the following coating systems:

1. TNEMEC: Pota-Pox Plus; Series N140, 2 coats, 4-6 mils each.
2. Carboline: Carboguard 61, 2 coats, 5-10 mils each.

B. Surfaces Not Painted. Surfaces such as steel embedded in concrete, inside of gate compartments, stainless steel, bronze, machined surfaces and other corrosion resistant material shall not be painted. Machined steel surfaces shall receive rust inhibiting grease coating. Seal weld edges of surfaces forming compartments.

V. Installation

A. Pintle, gudgeon, and bearing plate casting shall be installed at the locations shown on the Drawings. Precise positioning of these components is essential for proper gate operation. The components shall be level, vertical and true to line and location. Positioning shall be verified prior to 2nd stage concrete placements through precise surveyed measurements, or through the use of a template, to verify the pintle center and work points shown on the Plans. All necessary adjustments shall then be made, and the positioning rechecked prior to performing final installation.

B. The following placement tolerances shall apply:

1. Components shall be elevated to within 1/16 inch of the elevations indicated on the Plans.
2. The center of rotation point of the pintle shall be set to within 1/16 inch of the pintle offset dimensions indicated on the Plans.
3. Set pintle center part to mate with the lower part with no gaps exceeding 1/32 inch.
4. The centerline of the pintle upper part shall be aligned to within 1/32" of gate working line indicated on the drawings.

VI. Quoin Bearing Installation

A. Conform to manufacturer's recommendations for packing, mixing times, cure times, preparation, pouring, and safety precautions during use. Grout shall be place to provide full consolidation between the lower gate quoin block and bearing blocks, free of air gaps.

B. The Contractor shall perform a test casting of this grout prior to installation at the new lower quoin bearing block to demonstrate ability to safely and properly mix, form, place,

and consolidate grout material. The test shall be of geometry similar to that of the quoin bearing block (approximately ½" thick by 9 inches wide) and shall be at least 4 foot long. The test shall use steel forming surfaces for the front and back and shall have side seals (forms) as recommended by the grout manufacturer. The test casting shall be disassembled prior to curing to demonstrate consolidation performance. The test shall be accepted by the Engineer prior to application at the lower quoin block. Dry testing of each rehabilitated gate valve shall be demonstrated to the ENGINEER prior to installation to verify clearances and operation. Submit written procedure for performing epoxy grout work, in accordance with the grout manufacturers written recommendations, with the gate rehabilitation plan.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the various repair items noted below:

REPLACE LOCK GATE GUDGEON ASSEMBLY shall be measured for payment each gudgeon assembly installed.

REPLACE UPPER LOCK GATE PINTLE ASSEMBLY shall be measured for payment each pintle assembly installed.

REPLACE LOWER LOCK GATE PINTLE ASSEMBLY shall be measured for payment each pintle assembly installed.

LOWER QUOIN POST BEARINGS shall be measured for payment per linear foot of quoin post bearing installed at each gate leaf.

BASIS OF PAYMENT

This work will be paid for according to the following.

REPLACE LOCK GATE GUDGEON ASSEMBLY shall be paid for at the contract unit price for each gudgeon assembly furnished and installed, including removal of the existing gudgeon assembly, furnishing new gudgeon casting, furnishing and installing new gudgeon casting connection bolts and gudgeon hardware, as specified on the plans.

REPLACE UPPER LOCK GATE PINTLE ASSEMBLY shall be paid for at the contract unit price for each pintle assembly installed, including removal of the existing pintle upper and center parts, furnishing new pintle upper and center parts, furnishing and installing new pintle upper and center parts connection bolts, bronze bushing, and hardware, as specified on the plans. This work shall exclude replacement of the upper lock gate pintle lower part, which shall be paid for separately, as directed, per the LOCK GATE UNIDENTIFIED STEEL REPAIRS - REPLACE PINTLE LOWER PART AT UPPER GATE item.

REPLACE LOWER LOCK GATE PINTLE ASSEMBLY shall be paid for at the contract unit price for each pintle assembly installed, including removal of the existing pintle (upper, center, and lower parts), furnishing new pintle (upper, center, and lower part) castings, furnishing and installing new pintle (upper, center, and lower part) connection bolts and hardware, as specified on the plans.

LOWER QUOIN POST BEARINGS shall be paid for at the contract unit price per linear foot of quoin post bearing installed, furnishing new quoin post bearings, furnishing and installing bearing connection bolts and hardware, and placing epoxy grout at the adjusted bearings, as specified on the plans. This work shall exclude furnishing and installing the W10 quoin post at the bearing assembly, which is to be paid for elsewhere.

END OF SPECIAL PROVISION - LOCK GATE METAL CASTINGS

LOCK GATE REHABILITATION

DESCRIPTION

This Work shall consist of the removal, rehabilitation, reinstallation, and testing of existing lock gate leaves in accordance with the Drawings and Specifications. Under this Work, the Contractor shall provide lifting plans and repair procedures to rehabilitate and install structural steel miter gates as shown on the Drawings, and in accordance with the Contract Documents.

MATERIAL REQUIREMENTS

I. Miter Gate Steel Fabrications

A. Materials, fabrication, and installation of miter gate fabrications shall generally conform to the requirements of Section 505 of the IDOT Standard Specifications for Road and Bridge Construction. Bolts and studs shall be of steel conforming to ASTM A325 and as indicated on the plans. Corrosion-resistant bolts, nuts, and washers shall conform to ASTM A193 Class 1 Gr. B8, ASTM A194 Gr. 8, and AISI Type 304, respectively. Stainless Steel shall meet the requirements of ASTM A276, Type 304.

II. Castings

A. Refer to SPECIAL PROVISION - LOCK GATE METAL CASTINGS for requirements related to the pintle assemblies (upper, center, and lower parts), gudgeon assemblies, and lower quoin bearings. This provision also includes work related to epoxy grout filler required to fill the space between the W10 quoin post and quoin bearing block, upon adjustment of the rehabilitated gate at the new lower monolith.

III. Lock Gate Bottom Seals

A. The rubber seals shall be molded only and the material shall be compounded of natural rubber or a copolymer of butadiene and styrene, or a blend of both and shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents and plasticizers. Physical characteristics shall meet the following:

PART 1 Physical Test	**PART 2** Test Value	**PART 3** Test Method Specification
Tensile Strength	2,500 psi (min.)	ASTM D412
Elongation at break	450% (min.)	ASTM D412
300% Modulus	900 psi (min.)	ASTM D412
Durometer Hardness		
Shore Type A	60 to 70	ASTM D676
Water Absorption	5% by weight (max.)	ASTM D471
Compression	30% (max.)	ASTM D395
Tensile Strength after		
Oxygen Bomb Aging	80% (min.) of tensile strength	ASTM D572

IV. Quoin/Miter Block and Bearing Retrofit

A Performing welding procedures, as identified on the plans, to retrofit (resurface) the gate quoin block, gate miter blocks, and upper gate bearing block. Provide retrofit work along the full height and width of the quoin and miter contact areas, avoiding overbuild of resurfacing materials. In lieu of the weld-based resurfacing retrofit shown on the plans, the Contractor may alternatively incorporate a polymeric repair system (brand name or equal to Belzona 1111 as accepted by the Engineer) to repair and rebuild the mating surfaces. The system shall be same as or equal to Belzona 1111 as accepted by the Engineer and shall include all necessary application tools and compounds. Conduct all resurfacing work in accordance with the manufacturer's recommendations. Conduct resurfacing work to the satisfaction of the Engineer.

V Gate Anchorages Linkage Assemblies

A. Material designations for gate anchorage linkage assemblies are specified on the Plans. Conform to fit and finish requirements as specified by this provision.

VI. Gate Anchorages Assemblies

A. Gate anchorage assemblies at the new lower gate monolith are specified on the Plans. Plates, bars, and rods for the gate anchorage assembly shall conform to ASTM A572 Grade 50 and shall meet the requirements for Fracture Critical Members (FCM). The anchor rod, pin connection plates, and nuts are considered fracture critical members (FCM). Applicable provisions of ASTM A709 and AASHTO/AWS D1.5M/D1.5, Section 12 shall apply. Testing shall be conducted in accordance with ASTM A709, Paragraph S84.2, to demonstrate materials meet fracture critical requirements. The impact testing temperature zone shall be considered Zone 1. The Contractor is responsible to provide verification that such fracture critical members are in conformance with Table S1.3. Conform to fit and finish requirements as specified by this provision. Nonshrink grout, installed under the anchorage assembly plate upon final adjustment, shall conform to SECTION 1024 GROUT AND NONSHRINK GROUT.

VII. Gate Bushings

A. Bronze bushings are required at the pintle upper part and gudgeon collar. Material designations for bushings are specified on the Plans. Conform to fit and finish requirements as specified by this provision.

VIII. Finishing and Fits

A. Dimensions of machined parts are the finished dimensions after fabrication and machining. Unless otherwise specified, all dimensions for machine finished surfaces and parts shall be held within a tolerance of 0.01 in. Provide finishes as designed on the plans in accordance with ANSI roughness requirements. Provide fits as designed on the plans

in accordance with ANSI Standard Fits.

IX. Quoin Post

A. Provide quoin post (W10), angles, and anchors for quoin post system assembly at lower gate as specified on the Plans.

X. Railing

A. Miter gate railing materials, fabrication, and installation shall generally conform to the requirements of Section 509 of the IDOT Standard Specifications for Road and Bridge Construction.

CONSTRUCTION REQUIREMENTS

I. Submittals - Gate Removal, Installation, and Testing Plan

A. Provide written procedure identifying the steps, sequence, equipment, and methods of removing, staging, positioning, leveling, and installing miter gate, and related gate components (quoin post, pintle, anchorages, etc…). The plan shall outline measures taken to ensure proper fit up of the miter gate upon reinstallation to satisfy specified tolerance requirements. The Contractor shall submit detailed plan for installation of gates and alignment of embedded parts prior to gate installation. The procedure shall include, but is not limited to, means and methods of gate diagonal adjustments, anchorage adjustments, quoin bearing adjustments, sill seal embedment adjustments, or other means of establishing installed gates to a plumb and level condition, according to the dimensions indicated on the Drawings. Include schedule for conducting testing procedure and details for performing testing Work. The Engineer shall accept the Contractor's submitted plan prior to removal of the existing miter gates from the lock.

II. Shop Drawings

A. Shop drawings showing all details necessary for fabrication and installation of miscellaneous metal items shall be submitted to Engineer for review. Fabrication and erection shall not be started until shop drawings have been accepted by Engineer.

III. Existing Gate Survey and Alignment

A. The Contractor is responsible to take physical measurements, perform survey, and document conditions at the existing upper and lower miter gates for purposes of verifying the newly rehabilitate gates will fit correctly upon reinstallation. The survey, as a minimum, shall include overall gate measurements, miter angle, quoin/miter block/bearing plumbness and straightness, and gap measurements at quoin and miter (if any). The survey shall also include elevation of the existing top of gates, top of pintle, top of sill, and gate anchorage centerline. The results of the survey shall be compared the dimensions shown on the plans to ensure the existing gate will fit to within specified tolerance at the gate monolith upon reinstallation. The geometry for the new lower monolith, and related gate components (pintle, anchorage, quoin post, miter angle), as shown on the Plans, are intended to match that of the existing lower gate monolith.

Where dimensions or elevations vary from those indicated on the Plans, the Contractor shall notify the Engineer.

IV. Lifting Plan

A. Gate removal lifting plans shall be designed by Licensed Professional Engineer, registered in the State of Illinois, and submitted to Engineer for acceptance before beginning of the lifting operation. Include, as a minimum, detailed information, drawings, and calculations regarding proposed lifting equipment, drawings denoting erection plan, and procedures to remove walkway components and lay to gate in the horizontal positions for rehabilitation work. The proposed lifting lug system has been designed for the gate weights indicated on the plans; however, a spreader beam is required to ensure the lifting lugs are not laterally loaded. The Contractor is responsible for design of all rigging and the spreader beam as part of this Lifting Plan. The Contractor may reconfigure the lifting lug system indicated on the Plans, with acceptance from the Engineer. The Contractor shall submit calculations, prepared by the licensed professional, for the reconfigured lifting lug system. The Contractor shall identify, disengage and remove each gate leaf from its supports and operating machinery in a manner that will not produce overstress distortion or damage to any materials which are to remain or be reinstalled.

V. Miter Gate Walkway Grating

A. Removal of miter gate walkway grating is required for installation of gate lifting lugs and removal of the miter gates. Upon final installation of the rehabilitated miter gate, the walkway grating shall be reinstalled, using an in-kind fastening system. The Contractor shall supply new connection bolts and hardware (in-kind) to fasten the grating to the satisfaction of the Engineer.

VI. Railing

A. Install upstream gate walkway railing, as indicated by the Plans. Complete railing connection welding to the miter gate prior to painting of the gates. Upon reinstallation of the miter gate, the gate shall be carefully positioned to recess to verify clearances between the newly installed railing components and gate monolith features. Where specified clearance cannot be achieved, the Contractor shall perform modifications, by methods accepted by the Engineer, to the gate monolith features to provide specified clearances. Modify the existing downstream railing, as indicated on the plans. Galvanize new and existing gate walkway railing after fabrication.

VII. Gate Components to be Removed

A. The Contractor shall provide the Department the opportunity to retain possession of any existing gate items specified for removal and disposal. These items may include existing diagonal straps, pintle components, gate anchorage links, gudgeon assemblies, lubrication

lines, or other gate related components. Such items shall be handled with care and shall remain undamaged by removal. The Department has the right to reject such items upon removal, in which case these items shall be disposed of by the Contractor in accordance with the Specifications.

VIII. Miter Gate Unidentified Repairs

A. Because certain portions of the Work are currently concealed, such as the lower portions of the gates, it is anticipated that additional repairs will be necessary that cannot currently be specified. Such repairs may become evident after the gates are removed, cleaned, and observed by the Engineer. Under this Work, the Contractor shall provide the Engineer access to inspect the removed miter gates upon cleaning. The Engineer will provide the Contractor direction on required miter gate repairs. Repair Work, for such unidentified repairs, shall conform to the provision for LOCK GATE UNIDENTIFIED STEEL REPAIRS. Any member that has been repaired, or is being repaired, without the prior approval of the repair by the Engineer shall be deemed unacceptable.

IX. Engineer's Inspection for Repairs

A. Gate inspection shall meet the following requirements, as a minimum:

B. All gate surfaces shall be fully cleaned of debris by sandblasting, or other approved methods, to the satisfaction of the Engineer. The Contractor shall provide the Engineer a minimum of 14 calendar days notice prior to completion of cleaning for a 2-day inspection by the Engineer. The Contractor shall provide access, equipment, and personnel necessary to allow for a full inspection of the gate steel. Lifting and rotation of the gate leaves by the Contractor may be necessary to complete this inspection if the gate cannot be initially positioned in a manner that allows for full inspection of gate steel. Steel repairs, undetermined as this time, may be issued based on the findings of the inspection. The Contractor shall allow the Engineer a minimum of 14 calendar days following the completion of the inspection to provide any additive repair details.

C. The Contractor shall provide the Engineer a minimum of 14 calendar days notice prior to completion of gate rehabilitation and before the gate is ready for installation back into the lock. Pintle installation work, as a minimum, must be inspected and approved by the Engineer prior to the resetting, adjustment, and testing of the gates.

X. Painting

A. Painting Work shall conform to the provisions for EXTERIOR PAINTING.

XI. 2nd Stage Concrete Placements

A. Miter gate components cast in second stage concrete, such as the pintle lower part, quoin post, and sill seal angle, shall be installed at the locations shown on the Drawings. Precise positioning of these components is essential for proper gate operation. All positioning shall be verified prior to 2nd Stage concrete placement through precise surveyed measurements, or through the use of templates. All necessary adjustments shall

then be made, and the positioning rechecked prior to performing 2nd Stage concrete placement.

XII. Gate Anchorages Linkage Assemblies

A. Adjustment of linkage assemblies shall be done with the anchorage system in an unloaded state, or under the supervision of the Engineer. Provide initial adjustment of the linkage assembly as shown on the Plans.

B. Exposed surfaces of the anchorage linkage assemblies shall be painted in accordance with the provisions for miter gate painting in EXTERIOR PAINTING. Finished and threaded surfaces of the anchorage linkage assemblies shall not be painted and shall be greased for smooth operation during assembly and installation.

XIII. Gate Anchorages Assemblies

A. Miter gate anchorages shall be installed level and adjusted as shown on the Plans. The centerline of the gate anchorage shall be elevated to within 1/16 inch of the elevation shown on the Drawings.

B. Exposed surfaces of the anchorage assemblies shall be painted in accordance with the provisions for miter gate painting in EXTERIOR PAINTING. Finished and threaded surfaces of the anchorage assemblies shall not be painted and shall be greased for smooth operation during assembly and installation.

XIV. Gate Diagonals

A. Perform adjustments to gate diagonals under the observation of the ENGINEER. Diagonals shall be taught prior to setting of the gate leaf. With the gate installed, tension primary diagonals (extending from upper quoin to lower miter) to the plumb position and adjust secondary diagonals to remove slack, where present. Operate strap turnbuckle in a manner that will not damage the gate or straps. Subsequent adjustment of the straps may need to be made with the gate removed and in the flat position in order to perform such adjustments.

XV. Gate Bottom Seals

A Seals shall be cut from single pieces of seal strip with no splices. The factory assembled seal segments shall be provided with excess length to allow field trimming after installation/alignment on the gate. Holes for bolts shall be drilled through the seal as shown on the plans. Stainless steel plates shall be as shown on the plans. Seals and plates shall be installed and fixed as shown on the plans. Steel adjacent to the seals shall be cleaned and painted as indicated on the contract plans prior to installation of rubber materials and supporting steel. The miter sill angle embedment shall be installed and adjusted in conjunction with the installed and adjusted miter gate. Second stage concreting for the miter sill angle shall not commence until all adjustments are completed and accepted by the Engineer.

XVI. Miter Guide Retrofit

A. Miter guide retrofit shall consist of removing the existing guide roller, cleaning the roller and bracket assembly, lubricating the roller system, and reinstalling the roller system. The Contractor shall notify the Engineer upon disassembly and cleaning for inspection of the guide components. Repair guide as directed by the Engineer.

XVII. Tolerances

A. The following placement tolerances shall apply:

1. The miter gate shall be plumb and level, according to the dimensions indicated on the Plans.

2. The quoin block on the gate shall be installed with a tight fit against the quoin post with no gaps when the gate leaf is in the fully mitered position and loaded by full head differential of normal upper and lower pools. Gaps shall not exceed 1/32 inch at any point along the quoin contact surface with the fully mitered gate in an unloaded state.

3. The miter blocks on each miter gate shall mate flush over the entire surface of the miter contact area when the gates leaves are fully mitered and loaded by full head differential of normal upper and lower pools. Gaps shall not exceed 1/32 inch at any point along the miter contact surface with the fully mitered gate in an unloaded state.

4. The miter gate sill shall be installed offset to the back of the miter gate to the dimension indicated on the Plans. The offset dimension shall not vary more than 1/16” in either direction upon final installation.

5. Refer to SPECIAL PROVISION - LOCK GATE METAL CASTINGS for tolerance requirements related to the pintle assemblies (upper, center, and lower parts), gudgeon assemblies, and lower quoin bearings.

XVIII. Acceptance Testing

A. When testing is to be performed, which requires operation of the lock machinery, the testing shall be coordinated in accordance with all other disciplines and with the Department. Initial testing shall be performed while the lock is dewatered, while final testing shall be performed in the wet. All testing results in both the initial testing and final testing are subject to the acceptance of the Engineer. Additional dewatering may be required after in-the-wet testing to adjust or re-test the gate in-the-dry as directed by the Engineer.

B. When the gates are ready for testing, the Contractor shall meet with the Engineer to arrange a test schedule, and shall keep available personnel capable for making gate adjustments for a minimum of ten (10) working days in order to provide operation of the

lock for all tests and to make all adjustments and corrections which shall be required to complete the tests.

C. The Contractor shall prepare a field testing procedure, which shall be approved by the Engineer.

D. The following testing and inspection requirements shall apply:

1. Perform dry testing with work area completely dewatered. Initial dry testing shall be performed at the point when the rehabilitated gate is aligned and installed, while subsequent testing may be required, based on the results of initial testing. Swing gate back and forth from miter to recess, a minimum of 5 cycles, and verify specified tolerances and check for potential interferences or binding areas. All testing results in both the initial testing and subsequent testing are subject to the approval of the Engineer.

2. Wet testing shall be performed only upon acceptance of dry testing of both gates (upper and lower) by the Engineer. Perform wet testing with lock pool levels within 1 foot of normal pool, as indicated on the plans. Prepare lock as necessary to perform operation of lock, including, but not limited to, removal of bulkhead systems and preparation of filling/emptying systems for operation. Refill lock area with both gates in the fully mitered position. Fully raise/lower lock chamber pool a minimum of 5 times with gates mitered. Swing unloaded gate back and forth from miter to recess between each filling/emptying cycle, and verify specified tolerances and check for potential interferences or binding areas. All testing results in both the initial testing and subsequent testing are subject to the approval of the Engineer.

3. During the test runs (dry or wet), the entire lock operating machinery shall be inspected to determine whether everything is in proper working order and fully meets the requirements of the Plans and Specifications. If any tests show that any components are defective or inadequate, or function improperly, the CONTRACTOR shall make all corrections, adjustments, or replacement required before the final acceptance at no additional cost to the Department.

4. Repeat procedure above as directed by the ENGINEER.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the various items noted below:

LOCK GATE REHABILITATION - GENERAL UPPER GATE shall be measured for payment as a single lump sum item.

LOCK GATE REHABILITATION - GENERAL LOWER GATE shall be measured for payment as a single lump sum item.

LOCK GATE REHABILITATION - GATE ANCHORAGE LINKAGE ASSEMBLIES shall be measured for each gate anchorage linkage assembly furnished and installed.

LOCK GATE REHABILITATION - LOWER GATE ANCHORAGE ASSEMBLIES shall be measured for each gate anchorage assembly furnished and installed.

LOCK GATE REHABILITATION - MITER SILL SEAL shall be measured for each linear foot of miter sill seal furnished and installed.

LOCK GATE REHABILITATION - LOWER GATE QUOIN POST shall be measured for each linear foot of new quoin post furnished and installed at the new lower gate monolith.

LOCK GATE REHABILITATION - MITER/QUOIN/BEARING RETROFIT shall be measured for payment as a single lump sum item.

LOCK GATE REHABILITATION - UPPER GATE RAILING MODIFICATIONS shall be measured for payment as a single lump sum item.

LOCK GATE REHABILITATION - LOWER GATE RAILING MODIFICATIONS shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

LOCK GATE REHABILITATION - GENERAL UPPER GATE shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required for temporary gate removal, temporary removal and reinstallation of walkway grating, furnishing and installing gate lifting lug system, drilling weep holes, furnishing and installing miter gate diagonals, miter guide retrofit, alignment and testing of miter gates, or other items incidental to removing, repairing, reinstalling, or repairing the upper miter gate.

LOCK GATE REHABILITATION - GENERAL LOWER GATE shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required for temporary gate removal, temporary removal and reinstallation of walkway grating, furnishing and installing gate lifting lug system, drilling weep holes, furnishing and installing miter gate diagonals, miter guide retrofit, alignment and testing of miter gates, or other items incidental to removing, repairing, reinstalling, or repairing the lower miter gate.

LOCK GATE REHABILITATION - GATE ANCHORAGE LINKAGE ASSEMBLIES shall be paid for at the contract unit price for each anchorage linkage assembly (gudgeon collar, pins, clevises, adjustment nuts, threaded eyes, fittings, and bushing), including, but not limited to, all labor, materials, and equipment required for removal of the linkage assemblies, furnishing and installing new linkage assemblies, and performing adjustments, as specified on the Plans.

LOCK GATE REHABILITATION - LOWER GATE ANCHORAGE ASSEMBLIES shall be paid for at the contract unit price for each lower gate anchorage assembly (threaded rod, connection plates, anchors, hardware, and welds), including, but not limited to, all labor, materials, and equipment required for furnishing and installing new anchorage assemblies and anchor bolts, performing adjustments, and grouting the anchorage base, as specified on the Plans.

LOCK GATE REHABILITATION - MITER SILL SEAL shall be paid for at the contract unit price for each linear foot of miter sill seal, including, but not limited to, all labor, materials, and equipment required for removing existing, furnishing and installing new rubber seal, keeper plate, gate stop bearing plate, and connection hardware, as specified on the Plans. Payment for the lower miter sill steel embedments, anchoring system, and second stage concrete shall be paid for separately as part of the CONCRETE STRUCTURES pay item.

LOCK GATE REHABILITATION - LOWER GATE QUOIN POST shall be paid for at the contract unit price for each linear foot of new quoin post furnished and installed at the new lower gate monolith, including, but not limited to, all labor, materials, and equipment required for furnishing and installing the W10 quoin post, quoin post cap plate, quoin post anchor bolts and hardware, and performing adjustment. Payment for second stage concrete at the quoin post shall be paid for separately as part of the CONCRETE STRUCTURES pay item.

LOCK GATE REHABILITATION - MITER/QUOIN/BEARING RETROFIT shall be paid for at the contract unit price for each existing gate quoin block, gate miter block, or each upper quoin bearing for the entire area (height and width) contact along that gate. This item shall include all labor, materials, and equipment required to retrofit (resurface) the contact area in accordance with the Plans and Specifications.

LOCK GATE REHABILITATION - UPPER GATE RAILING MODIFICATIONS shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment required for furnishing and installing the new handrail on the upstream side of the gate walkway, retrofitting the existing handrail on the downstream side of the gate walkway, all connections to existing miter gate steel, galvanizing, chains, connection hardware, and modifications to the gate monolith features as necessary to achieve required installation clearances. The items shall include all railing work for the upper miter gate.

LOCK GATE REHABILITATION - LOWER GATE RAILING MODIFICATIONS shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment required for furnishing and installing the new handrail on the upstream side of the gate walkway, retrofitting the existing handrail on the downstream side of the gate walkway, all connections to existing miter gate steel, galvanizing, chains, connection hardware, and modifications to the gate monolith features as necessary to achieve required installation clearances. The items shall include all railing work for the lower miter gate.

Payment for cleaning and painting of existing miter gate steel shall be made in accordance with the provisions for EXTERIOR PAINTING.

Payment for LOCK GATE UNIDENTIFIED STEEL REPAIRS, associated with miter gate rehabilitation work, is specified by a separate Special Provision.

END OF SPECIAL PROVISION - LOCK GATE REHABILITATION

LOCK GATE UNIDENTIFIED STEEL REPAIRS

DESCRIPTION

This Work shall consist of the repair of the existing lock gate leaves in accordance with the Drawings and Specifications. Because certain portions of the Work are currently concealed, such as the lower portions of the gates, it is anticipated that additional repairs will be necessary that cannot currently be specified. Such repairs may become evident after the gates are removed, cleaned, and observed by the Engineer. Under this Work, the Contractor shall provide the Engineer access to inspect the removed miter gates upon cleaning. The Engineer will provide the Contractor direction on required miter gate repairs.

MATERIAL REQUIREMENTS

A. Material requirements for plate, bolts and welding shall generally conform to Sections 505 and 1006 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS

Construction requirements shall generally conform to Sections 505 and 1006 of the Standard Specifications.

I. Shop Drawings

A. Shop drawings showing all details necessary for fabrication and installation of repair Work requiring fabrication, where required, shall be submitted to Engineer for review. Fabrication and erection shall not be started until shop drawings have been accepted by Engineer.

II. Inspection

A. Provide Engineer access for inspection of gate steel in accordance with the LOCK GATE REHABILITATION Specification. The inspection will be used as a basis to develop repairs requirements for the Contractor.

III. Painting

A. Perform repair work to the greatest extent practical prior to painting miter gates. Perform field touchup as required. When specified, new structural steel shall be cleaned and painted according to Section 506. All high-strength bolts and other connectors, including nuts and washers, shall be mechanically galvanized according to Article 1006.08(a).

METHOD OF MEASUREMENT

In an effort to account for the cost of unidentified repairs, the Contractor shall assume that fixed quantities of such repairs are required, as outlined by the “Summary of Quantities” Drawing. Costs for such repair quantities shall be considered part of the Base Bid. These generic quantities shall be considered additional to any other repairs that are already planned and specified on the Drawings and/or in the Specifications. The actual quantities of such additional repairs shall be tracked in the field by the Contractor (quantities

subject to verification by the Engineer) and equitable adjustments (addition or deduction) to contract will be made based on the unit bid prices and the procedures outlined below.

This work will be measured for payment as indicated for the various repair items noted below:

LOCK GATE UNIDENTIFIED STEEL REPAIRS - 5/16" FILLET WELD shall be measured for payment per inch of fillet weld.

LOCK GATE UNIDENTIFIED STEEL REPAIRS - COMPLETE JOINT PENETRATION WELD shall be measured for payment per inch of complete joint penetration (CJP) weld.

LOCK GATE UNIDENTIFIED STEEL REPAIRS - REMOVE RIVET, INSTALL H.S. BOLT shall be measured for payment per each rivet removed and replaced with a high strength (H.S.) bolt.

LOCK GATE UNIDENTIFIED STEEL REPAIRS - FIELD DRILL AND INSTALL H.S. BOLT shall be measured for payment per each high strength (H.S.) bolt installed, including drilling of hole.

LOCK GATE UNIDENTIFIED STEEL REPAIRS - PLATE OR ROLLED SHAPE FABRICATIONS shall be measured for payment per pound of steel plate or rolled steel shape fabrications furnished and installed for miter gate repair.

LOCK GATE UNIDENTIFIED STEEL REPAIRS - REPLACE PINTLE LOWER PART shall be measured for payment per each pintle lower part at the upper miter gate, including removal and disposal of the existing, furnishing and installing new pintle lower part, and setting the new lower part in concrete as indicated by the Plans.

BASIS OF PAYMENT

This work will be paid for according to the following.

LOCK GATE UNIDENTIFIED STEEL REPAIRS - 5/16" FILLET WELD shall be paid for at the contract unit price per inch of fillet weld.

LOCK GATE UNIDENTIFIED STEEL REPAIRS - COMPLETE JOINT PENETRATION WELD shall be paid for at the contract unit price per inch of complete joint penetration (CJP) weld.

LOCK GATE UNIDENTIFIED STEEL - REMOVE RIVET, INSTALL H.S. BOLT shall be paid for at the contract unit price per each rivet removed and replaced with a high strength (H.S.) bolt.

LOCK GATE UNIDENTIFIED STEEL REPAIRS - FIELD DRILL AND INSTALL H.S. BOLT shall be paid for at the contract unit price per each high strength (H.S.) bolt installed, including drilling of hole.

LOCK GATE UNIDENTIFIED STEEL REPAIRS - PLATE OR ROLLED SHAPE FABRICATIONS shall be paid for at the contract unit price per pound of steel plate or rolled steel shape fabrications furnished and installed for miter gate repair.

LOCK GATE UNIDENTIFIED STEEL REPAIRS - REPLACE PINTLE LOWER PART shall be paid for at the contract unit price per each pintle lower part at the upper miter gate, including removal and disposal of the existing, furnishing and installing new pintle lower part, and setting the new lower part in concrete as indicated by the Plans.

END OF SPECIAL PROVISION - LOCK GATE UNIDENTIFIED STEEL REPAIRS

LOCK GRATING AND COVERS

DESCRIPTION

This work shall consist of furnishing and installing bar grating at the lock intake structure and gate anchorage recess cover plate assemblies at the new lower gate monoliths at locations shown on the plans.

MATERIALS

A. Galvanized grating at the lock intake structure shall be W-19-4 (1-1/4" x 3/16") Steel.

B. Galvanized Raised pattern plate at gate anchorages shall be ASTM A786.

C. Materials shall be furnished according to Section 505 of the Standard Specifications as applicable.

CONSTRUCTION DETAILS

A. All work shall generally be conducted according to Section 505 of the Standard Specifications.

B. Cover and grating shall be placed true to line and grade with adjacent support sections and shall make full and even bearing on the underlying surface or supports. Verify flush fit of cover plates with embedded supports prior casting of embedments in concrete. Finish concrete to embedments as shown on the plans. Allow Engineer to inspect fit of components prior to casting.

C. Fabrication and installation of metal grating shall be in accordance with NAAMM Metal Bar Grating Manual (MBG 531-09) or Heavy Duty Metal Bar Grating Manual (MBG 532-09), as applicable.

D. All bar grating edges shall be banded banding bars shall have a minimum 1/4" thickness.

E. All grating and associated hardware shall be galvanized.

F. Attach grating sections to each support with saddle clip and 1/4" diameter fastener. Minimum 4 connections per panel at each support.

G. Galvanize all gate anchorage recess cover plate assemblies after fabrication in accordance with the Standard Specifications.

H. Hinges shall be furnished and installed as shown on the plans and shall be stainless steel (Type 304 or 316). Verify free rotation of hinged assemblies after fabrication. Binding of hinges will not be permitted.

METHOD OF MEASUREMENT

LOCK GRATING AND COVERS shall be measured for payment as a single lump sum item for metal bar grating at the lock intake structure and gate anchorage recess cover plate assemblies at the new lower gate monoliths. Gate operating machinery cover work at the new lock monoliths and existing upper monolith are not included with this item and shall be paid for separately.

BASIS OF PAYMENT

Bar grating at the lock intake structure and gate anchorage recess cover plate assemblies at the new lower gate monoliths shall be paid for at the contract lump sum price for LOCK GRATING AND COVERS and shall include all labor, materials, and equipment required to furnish and install metal bar grating at the lock intake structure, gate anchorage recess cover plates, gate anchorage recess cover plate ledger angles, hinges, support angles, anchor stud, and connection hardware. Gate operating machinery covers at the new lock monoliths and Cover for gate operating machinery recesses at the new lower monolith and existing upper monolith are not included with this item and shall be paid for separately.

END OF SPECIAL PROVISION – LOCK GRATING AND COVERS

LOCK MOORING CABLES

DESCRIPTION

I. This work shall consist of furnishing and installing cables and hardware through the treated timber mooring posts including connections to the existing cable mooring system and terminations at the end of the mooring system.

MATERIAL

I. Plastic Covered Wire Cable

A. Plastic covered wire cable shall

II. Cable and Mounting Hardware

A. Cable shall be 15/32-in diameter Permaflex cable or equal. It shall consist of a 3/8-in diameter 7X19 galvanized steel wire rope coated and impregnated with a yellow polypropylene plastic. The cable shall have a breaking strength of 14,400 lbs.

B. Cable thimbles, cable clamps, washers, lock washers, nuts, threaded rod and turnbuckles shall be electro galvanized. Hardware shall conform to Section 1094.04 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS

I. General

A. The cable system shall be installed outside of the normal boating season.

II. Mooring Cables

A. After the treated timber piles have been installed and the holes drilled for the cables, the Contractor shall install the new cable system as indicated in the plans.

B. Cables shall be tensioned so there is less than ¾-in deflection at the mid-span between the treated timber piles.

C. Cable with damage to the outer polyethylene sheath shall be removed and replaced.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

LOCK MOORING CABLES shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

LOCK MOORING CABLES will be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to furnish and install the mooring cable system through the treated timber piles as shown on the plans.

END OF SPECIAL PROVISION – LOCK MOORING CABLES

LOCK STEEL PIPING

DESCRIPTION

The work shall consist of furnishing, installing and testing steel pipe of the sizes as required in the Contract Documents and as directed by the Engineer. This work shall include steel pipe for the lock intake structure, lock filling diffuser system, existing lower monolith emptying ports, and new lower emptying ports. Steel piping for the lock intake structure and new lower emptying ports are cast in concrete and shall be uncoated. Steel piping for the existing lower monolith emptying ports shall be lined and coated per the applicable sections herein. Steel piping and saddles for the lock filling diffuser system shall be galvanized after fabrication.

MATERIAL REQUIREMENTS

Unless noted otherwise, Lock Steel piping shall be 1/2" wall DSAW API 5L Grade B coated with 50 mil of 100% solids epoxy, Indurion Warrior 100 or equal. Pipe shall be lined with 25 mil high solids chemically cured epoxy coating, Indurion Ceramapure 90L Ceramic Epoxy or equal. All joints shall be welded.

I. Steel Fittings

A. Steel fittings are defined as a special piece of pipe other than a normal straight section. Elbows, crosses, tees and reducers are fittings.

B. Fittings shall be butt-welded conforming to ASME B16.9. Material shall be the same wall thickness and material type as the pipe.

II. Flanges

A. Provide slip on flanges for attachment to pipe. Joints between pipe and slip on flanges shall be fillet welds to the interior and exterior. Flange material shall conform to ASTM A 105, A 181, or A 182. Flanges shall be flat faced.

B. Class 150 flanges shall comply with AWWA C207, Class E or ASME B16.5, Class 150.

III. Field Applied Epoxy Coating for Patching

A. Field repairs to lining and coating systems shall be as recommended by the coating and lining manufacturer.

IV. Bolts and Nuts for Flanges

A. Materials, fabrication, and installation of bolts and hardware shall generally conform to the requirements of Section 505 of the IDOT Standard Specifications for Road and Bridge Construction. Bolts shall be of steel conforming to ASTM A325 and as indicated on the plans. All bolts and hardware shall be galvanized.

V. Outlets

A. For buttwelded outlets, use a XS Buttweld Pipet by WFI International, Inc. or approved equal.

CONSTRUCTION REQUIREMENTS

I. Submittals

A. Submit piping layout drawings showing location and dimensions of all pipe and fittings. Include laying lengths of valves and other appurtenances determining piping dimensions. Label or number each fitting or piece of pipe. Call out all weld sizes and dimensions of mitered bends, flanges, fittings and joint harnesses.

B. Submit coating application test records for measuring coating thickness and holiday detection for each pipe section and fitting. Describe repair procedures used.

C. Submit work plan for conducting 36 inch diameter horizontal bore into existing downstream monolith for connection of 24 inch steel emptying pipe, including, but not limited to, means and methods of conducting existing concrete boring to neat lines, removing existing concrete, maintaining boring alignment, cutting existing emptying port steel lining, aligning new pipe to existing, providing consolidated non-shrink grout around new piping, plugging downstream portion of existing emptying port with consolidated concrete, and sequencing work activities with seasonal lock operation.

D. Submit work plan for temporarily stabilizing and aligning pipe to be cast in concrete. This shall include, as a minimum, the lock intake structure and new lower monolith piping. The Contractor is responsible for keeping pipe stable through the concrete casting process. Indicate means and methods of securing pipe against misalignment or floatation during the casting process.

II. Inspection and Field Verification

A. The Engineer, or authorized representative, may inspect materials, fabrication, and testing at the manufacturer's plant.

B. Where new pipelines are to be connected to existing pipelines, the Contractor shall verify in the field the location, elevation, pipe material, pipe outside diameter, and any other characteristics of the existing waterline before proceeding with the pipe fabrication or installation. This field verification shall be performed in the presence of the Engineer. Adjust and align the new piping as necessary to meet the field conditions and provide all required material, labor and equipment to make the connection.

III. Fabrication, Assembly and Installation

A. Beveled ends for butt-welding shall conform to ASME B16.25. Remove slag by chipping or grinding. Surfaces shall be clean of paint, oil, rust, scale, slag and other material detrimental to welding. When welding the reverse side, chip out slag before welding.

B. Fabrication shall comply with ASME B31.3, Chapter V. Welding procedure and performance qualifications shall be in accordance with Section IX, Articles II and III, respectively, of the ASME Boiler and Pressure Vessel Code.

C. Apply full penetration weld to exterior joint of butt-welded pipe, fittings and welding neck flanges. Apply fillet welds to the interior and exterior circumference of

the pipe and slip on flanges. Minimum size of fillet weld shall be equal to the steel cylinder thickness. Complete each pass around the entire circumference of the pipe before commencing the next pass. Use electrodes recommended by the pipe fabricator. Do not deposit more than 1/8-inch of throat thickness per pass. The completed weld shall have a minimum of three (3) passes or beads.

D. Use the shielded metal arc welding (SMAW) process for welding.

E. Welding preparation shall comply with ASME B31.3, paragraph 328.4. Limitations on imperfections in welds shall conform to the requirements in ASME B31.3, Table 341.3.2, and paragraph 341.4 for visual examination.

F. Identify welds in accordance with ASME B31.3, paragraph 328.5.

G. Clean each layer of deposited weld metal prior to depositing the next layer of weld metal, including the final pass, by a power-driven wire brush.

H. Welding electrodes shall comply with AWS A5.1.

I. After shop fabrication and prior to shop applied epoxy, test each welded joint by the liquid penetrant method. Conform to the requirements specified in ASTM E 165. The materials used shall be either water washable or nonflammable. Products: "Spotcheck" by the Magnaflux Corporation or "Met-L-Check Flaw-Findr" by the Met-L-Check Company. Chip out all defects, reweld, and retest the section affected until it shows no leaks or other defects.

IV. Shop Applied Epoxy Lining and Coating

A. Surface preparation for Steel Pipe coating and lining shall be SSPC-SP 10, N.A.C.E. #2, or SA 2 ½ blast, minimum 3 mils profile.

V. Quality of Lining and Coating Applications

A. The cured lining and coating shall be smooth and glossy, with no graininess or roughness. The lining and coating shall have no blisters, cracks, bubbles, underfilm voids, mechanical damage, discontinuities or holidays.

VI. Shop Testing of Lining and Coating

A. Test lining and coating with a low-voltage wet sponge holiday detector in accordance with AWWA C213, Section 5.3.3. If the number of holidays or pinholes is less than one per 10 square feet of coating surface, repair the holidays and pinholes by applying the coating manufacturer's recommended patching compound to each holiday or pinhole and retest. If the number of holidays or pinholes exceeds one per 10 square feet, remove the entire pipe lining and coating and recoat the entire piping and retest.

B. Check for coating defects on the weld seam centerlines. There shall be no porous blisters, craters, or pimples lying along the peak of the weld crown.

C. Measure the lining and coating thickness at three locations on each pipe section using a coating thickness gauge calibrated at least once per eight-hour shift. Record each

measured thickness value. Where individual measured thickness values are less than the specified minimum thickness, measure the coating thickness at 6-inch intervals along the pipe length. The average of these measurements shall exceed the specified minimum thickness value, and no individual thickness value shall be more than 2 mils below or 3 mils above the specified minimum value. If a section of pipe does not meet these criteria, remove the entire lining and coating and recoat the entire pipe section or fitting.

D. The Engineer will conduct in the field an independent inspection of the lining and coating for compliance with the above criteria. Coated items failing his inspection will be cause for rejection.

E. Delivery and Temporary Storage of Pipe

F. Lift pipe with wide belt slings. Do not use cable slings or chains. Support the pipe on padded wooden blocks. Do not roll or drop the pipe on the ground or allow the pipe to fall from the delivery trucks. Protect the lining and coating of the pipe from damage or scratches. Cover pipe with plastic sheets and secure until ready for installation.

METHOD OF MEASUREMENT

LOCK STEEL PIPING – INTAKE STRUCTURE shall be measured for payment as a single lump sum item for steel pipe work at the lock intake structure, to be cast into the intake structure concrete and adjoined with HDPE pipe.

LOCK STEEL PIPING – NEW LOCK MONOLITHS shall be measured for payment as a single lump sum item for steel pipe work at the new lower lock gate monoliths, to be cast into the concrete monolith structures and adjoined with HDPE pipe.

LOCK STEEL PIPING – EXISTING LOCK MONOLITHS shall be measured for payment as a single lump sum item for steel pipe work at the existing lower lock gate monoliths, to be installed and grouted into cored existing concrete monolith structures and adjoined with HDPE pipe.

LOCK STEEL PIPING – DIFFUSER SYSTEM shall be measured for payment as a single lump sum item for steel pipe work at the chamber floor of the extended lock, to be installed and adjoined with HDPE pipe.

BASIS OF PAYMENT

Steel pipe work at the lock intake structure shall be paid for at the contract lump sum price for LOCK STEEL PIPING - INTAKE STRUCTURE and shall include all labor, materials, and equipment required to furnish and install pipe, pipe fittings (including flange adapters with backup rings, reducers as needed for connections), and intake structure vent piping, as specified on the plans.

Steel pipe work at the new lower monolith structures shall be paid for at the contract lump sum price for LOCK STEEL PIPING - NEW LOCK MONOLITHS and shall include all labor, materials, and equipment required to furnish and install pipe, pipe fittings (including flange adapters with backup rings, reducers as needed for connections), and perform welding of pipe joints, as specified on the plans.

Steel pipe work at the existing lower monolith structures shall be paid for at the contract lump sum price for LOCK STEEL PIPING - EXISTING LOCK MONOLITHS and shall include all labor, materials, and equipment required to furnish and install pipe, pipe fittings (including flange adapters with backup rings, reducers as needed for connections), perform concrete removal (coring) at existing monoliths necessary to establish piping connection, establish alignment of new pipe to existing, and perform positioning and grouting of new steel pipe into the existing lower monolith, as specified on the plans.

Steel pipe work for the lock diffuser system shall be paid for at the contract lump sum price for LOCK STEEL PIPING - DIFFUSER SYSTEM and shall include all labor, materials, and equipment required to furnish and install pipe, lock diffuser system and saddles, pipe fittings (including flange adapters with backup rings, nozzles, welding, reducers as needed for connections), and furnishing and installing diffuser system concrete pipe supports, as specified on the plans.

END OF SPECIAL PROVISION - LOCK STEEL PIPING

LOCKHOUSE ELECTRICAL WORK

DESCRIPTION

The work to be included under this item shall be the furnishing, installing, and testing of all materials and electrical equipment necessary in order to provide a complete and operational electrical system for the Stratton Lock and Dam Lock House in McHenry, Illinois.

Work to provide new supply feeder to the lock house is not included in this special provision. New supply feeder work, including new conductors to lock house panelboard, is included in site electrical special provisions.

The Contractor shall furnish and install all materials necessary for a complete and operational installation of the electrical equipment. The complete installation and wiring shall be done in a neat, workmanlike manner. All electrical work shall comply with the requirements of NFPA 70 – National Electrical Code (NEC), most current issue in force, and all other applicable local codes, laws, ordinances, and requirements in force. Electrical equipment shall be installed in conformance with the respective manufacturer's directions and recommendations for the respective application. Any installations which void the UL listing, FM Approval, ETL listing (or other third party listing), and/or the manufacturer's warranty of a device will NOT be permitted.

The electrical work and equipment specified is based on equipment of the type and size as noted on the Plans and specified herein. Should the proposed loads exceed the ratings of the electrical equipment specified, the General Contractor shall be solely responsible for furnishing any and all modifications necessary in order to provide a fully functional system to the satisfaction of the Engineer at no change to the contract cost. The Contractor shall also be required to submit for review, sufficient information determined by the Engineer to be necessary to review such alternates or modifications.

All work, power outages, and/or shut down of existing systems shall be coordinated with the respective facility Engineer. Once shut down, the circuits shall be labeled as such to prevent accidental energizing of the respective circuits. All personnel shall follow U.S. Department of Labor Occupational Safety & Health Administration (OSHA) 29 CFR Part 1910 Occupational Safety & Health Standards for electrical safety and lockout/tagout procedures, including, but not limited to, 29 CFR Section 1910.147 the control of hazardous energy (lockout/tagout).

Contractor shall keep a copy of the latest National Electrical Code in force on site at all times during construction for use as a reference.

Contractor and respective electrical contractor shall keep a set of construction plans and specifications with all addenda and copies of any applicable change orders on site at all times.

SUBMITTALS

Contractor shall provide shop drawings for all electrical equipment. Shop drawings shall clearly indicate proposed items, capacities, characteristics and details in conformance with the Plans and Specifications. The respective manufacturer shall certify capacities, dimensions, special features, etc. Shop Drawings for all items shall be prepared immediately upon award of Contract. The Contractor shall submit PDF electronic copies. No materials shown thereon shall be ordered until Shop Drawings are reviewed and approved by the Engineer. When a submittal is marked "Revise and Resubmit," "Rejected," and/or "Submit Specified Item" do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with

the notations, resubmit, and repeat if necessary to obtain a different action mark such as “No Exceptions Taken” or “Furnish as Corrected”. Contractor is responsible for compliance with the specified characteristics. Contractor’s responsibility for error and omissions in submittals is not relieved by the Engineer’s review of submittals. Accompany each submittal with a transmittal letter that includes the date, project title and number, Contractor’s name and address, the number of shop drawings, product data, and/or samples submitted, notification of any deviations from the Contract, and any other pertinent data. Shop drawing submittals shall include the following:

A. Date and revision dates.

B. Project title and number(s).

C. Identification of product or material.

D. Certified outline and installation drawings.

E. Performance data and operating characteristics.

F. Arrangement drawings showing piping, controls and accessory equipment.

G. Drawings on non-standard components and accessories.

H. Catalog data marked to indicate materials being furnished.

I. Operation and Maintenance/Instruction Manuals.

J. Specified standards, such as ASTM numbers, ANSI numbers, UL listing/standard, NEMA ratings, etc.

K. Identification of previously approved deviation(s) from Contract documents.

L. Contractor’s stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract documents.

M. Space for Prime Contractor’s approval stamp.

N. Fire Alarm Shop Drawing Submittals Will Include:

1. Shop Drawings shall be prepared by persons with the following qualifications:

    a. Trained and certified by manufacturer in fire-alarm system design.
    b. NICET-certified fire-alarm technician, Level III minimum.

2. Product Data: For each type of product indicated.
3. Shop Drawings: For fire-alarm system. Include plans, elevations, sections, details, and attachments to other work:

    a. Comply with recommendations in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72.
    b. Include voltage drop calculations for notification appliance circuits.
    c. Include battery-size calculations.

d. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale and coordinating installation of duct smoke detectors and access to them. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators. Locate detectors according to manufacturer's written recommendations.
e. Retain subparagraph below for projects where routing of cable or conduit is critical and only outlet locations are shown on Drawings. Delete reference to device addresses if shown on Drawings.
f. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits.

4. Field quality-control reports.
5. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals:

a. Comply with the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
b. Provide "Record of Completion Documents" according to NFPA 72 article "Permanent Records" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter.
c. Record copy of site-specific software.
d. Provide "Maintenance, Inspection and Testing Records" according to NFPA 72 article of the same name and include the following:

1) Frequency of testing of installed components.
2) Frequency of inspection of installed components.
3) Requirements and recommendations related to results of maintenance.
4) Manufacturer's user training manuals.

6. Manufacturer's required maintenance related to system warranty requirements.
7. Abbreviated operating instructions for mounting at fire-alarm control unit.
8. Copy of NFPA 25.
9. Software and Firmware Operational Documentation:

a. Software operating and upgrade manuals.
b. Program Software Backup: On magnetic media or compact disk, complete with data files.
c. Device address list.
d. Printout of software application and graphic screens.

O. Premise Distribution System Shop Drawing Submittals Will Include:

1. Submit to the engineer/designer shop drawings, product data (including cut sheets and catalog information), required by the contract documents. Submit shop drawings, product data, with such promptness and in such sequence as to cause no delay in the work or in the activities of separate contractors. The engineer/designer will indicate approval of shop drawings and product data submitted to the engineer by marking them approved. Submitted shop drawings shall be initialed or signed by the contractor, showing the date and the contractor's legitimate firm name:

    a. By submitting shop drawings and product data the contractor represents that he or she has carefully reviewed and verified materials, quantities, field measurements, and field construction criteria related thereto. It also represents that the contractor has checked, coordinated, and verified that information contained within shop drawings and product data conform to the requirements of the work and of the contract documents. The engineer/designer remains responsible for the design concept expressed in the contract documents as defined herein.
    b. The engineer's/designer's approval of shop drawings and product data submitted by the contractor shall not relieve the contractor of responsibility for deviations from requirements of the contract documents, unless the contractor has specifically informed the engineer/designer in writing of such deviation at time of submittal, and the engineer/designer has given written approval of the specific deviation. The contractor shall continue to be responsible for deviations from requirements of the contract documents not specifically noted by the contractor in writing, and specifically approved by the engineer in writing.
    c. The engineer's/designer's approval of shop drawings and product data shall not relieve the contractor of responsibility for errors or omissions in such shop drawings, product data, and samples.
    d. The engineer's/designer's review and approval, or other appropriate action upon shop drawings and product data, is for the limited purpose of checking for conformance with information given and design concept expressed in the contract documents. The engineer's/designer's review of such submittals is not conducted for the purpose of determining accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the contractor as required by the contract documents. The review shall not constitute approval of safety precautions or of construction means, methods, techniques, sequences, or procedures. The engineer's/designer's approval of a specific item shall not indicate approval of an assembly of which the item is a component:

1) Perform no portion of the work requiring submittal and review of shop drawings, and product data, until the engineer/designer has approved the respective submittal. Such work shall be in accordance with approved submittals.
2) Submit shop drawings, product data, and samples as a complete set within thirty (30) days of award of contract:

a) For initial submission and for resubmission required for approval, submit one (1) electronic copy of each item. The engineer/designer will review and return an electronic file. Make reproductions as required for your use and distribution to subcontractors.
b) Illegible submittals will not be checked by the engineer.

3) General: Submit the following:

a) Bill of materials, noting long lead time items.
b) Optical loss budget calculations for each optical fiber run.
c) Project schedule including all major work components that materially affect any other work on the project.

4) Shop drawings: Submit the following:

a) Backbone (riser) diagrams.
b) System block diagram, indicating interconnection between system components and subsystems.
c) Interface requirements, including connector types and pin-outs, to external systems and systems or components not supplied by the contractor.

5) Product Data -- Provide catalog cut sheets and information for the following:

a) Wire and cable.
b) Outlets, jacks, faceplates, and connectors.
c) Terminal blocks and patch panels.
d) Enclosures, racks, and equipment housings.
e) Over-voltage protectors.
f) Splice housings.

6) Project record drawings:

a) Submit project record drawings at conclusion of the project and include:

- *Approved shop drawings.*
- *Plan drawings indicating locations and identification of work area outlets, nodes, telecommunications rooms (TRs), and backbone (riser) cable runs.*
- *Telecommunications rooms (TRs), Telecommunications Enclosures (TEs) and equipment room (ER and/or MC) termination detail sheets.*
- *Cross-connect schedules including entrance point, main cross-connects, intermediate cross-connects, and horizontal cross-connects.*
- *Labeling and administration documentation.*
- *Warranty documents for equipment.*
- *Copper certification test result printouts and diskettes.*
- *Optical fiber power meter/light source test results.*

7) Operation and maintenance manuals.

REPLACE ELECTRICAL SUPPLY

This Item shall consist of removing, relocating, replacing and/or adjusting existing building supply conduits from the building panelboard to an existing pull box on the outside of the building. This item shall include all labor, equipment, raceways, grounding, materials, tools, labeling, testing and all incidentals for new conduit installation to the satisfaction of the Department and Engineer.

Not Included under this Item shall be the following:

A. New site electrical conduits between existing junction box on exterior of building to new site electrical service and distribution equipment location.
B. New building supply conductors unspliced from new electrical service and distribution equipment location to new lockhouse panelboard.

I. Demolition

A. All existing abandoned items above ceiling including hangers, supports, conduit, piping, wiring, etc., to be removed back to source and capped.

B. Remove all existing electrical materials and associated items as shown or noted on the drawings and as required by the Work.

C. Remove all abandoned wiring, conduit, fittings, etc., in the project area. Cap all stubs, and seal penetrations through walls and floors.

D. All Conditions shall be carefully field determined and verified prior to removal.

E. All existing items requiring power to remain, shall be re-connected to their existing circuits if interrupted by an adjacent item to be demolished.

F. Salvageable items such as lighting fixtures, devices, circuit breakers, etc., to be removed shall be turned over to the Department. Items not salvaged shall be removed from the property and disposed of legally.

G. Existing conduit to be re-used as much as possible. Add new conduit as needed. All wiring to be replaced complete.

H. Contractor to field verify all circuit numbers and update plans to reflect correct numbers during as-built drawing phase.

EQUIPMENT AND MATERIALS

I. Conduit and Fittings

A. Building Panelboard. Circuit breaker panelboard shall be rated 300A MCB, 120/240 VAC, 1-phase, 3-wire and shall have copper bus structure braced for 10,000 RMS Amperes fault current minimum at 240 VAC. All copper parts shall be plated to prevent corrosion. Panelboards shall bear the UL label. All panelboards shall be dead-front safety-type, equipped with thermal magnetic-molded case breakers and solid neutral bus. Bus bar connections to the branch circuit breakers shall be the "Distributed Phase" or "Phase Sequence" type. Bussing shall be such that adjacent single-pole breakers will be on different phases or polarities, and that two pole breakers can be installed at any

location. Panelboard numbering shall be such that starting at the top, odd numbers shall be used in sequence down the left hand side, and even numbers shall be used in sequence down the right hand side. Cabinets shall be fabricated of code-gauge, galvanized steel with gutters per the NEC. Fronts shall have doors with matching one-piece trim, be code-gauge, and be finished with rust-inhibiting primer and baked enamel. Fronts shall have adjustable indicating trim clamps completely concealed when door is closed. Provide a circuit directory frame and card with a clear plastic covering on the inside of the doors. Fronts shall have flush locks, and be furnished with two keys per lock. Provide circuit breakers, quick-make, quick-break, thermal-magnetic, trip indicating, and common trip on all multi-pole breakers. Handles shall have "ON", "OFF" and "TRIPPED" positions. Circuit breakers shall be UL-listed in accordance with UL Standard 489. Breakers shall have bolt-on connections to the bus. Amperage trip ratings, voltage ratings, interrupting current ratings, and number of poles shall be as shown on the panelboard schedules. Contractor shall confirm and adjust circuit breaker sizes, as required for the respective equipment or device being fed, in accordance with the respective equipment manufacturer's recommendation and the NEC. Panelboards shall be furnished with copper-ground bus and separate insulated copper neutral bus."

B. Transient Voltage Surge Suppressor for Service Panelboard. AC power surge arrester/transient voltage surge suppressor shall be UL-listed per UL 1449, Third Edition. AC power surge arrester/transient voltage surge suppressor for the main distribution panel shall be suitable for a 208Y/120 VAC, 3-phase, 4-wire, plus ground system with a surge current rating of 240,000-Amps, 8 x 20 microsecond wave per mode (L-L, L-N, L-G, N-G), and status indication lights in a NEMA 12-rated enclosure, Lightning Protection Corporation Model LPC 2020, or approved equal.

C. Fractional Horsepower Manual Motor Starters. Fractional horsepower manual motor starters shall be toggle-operated type with thermal overload protection in each phase conductor sized for the respective motor. Fractional horsepower manual motor starters shall be installed in NEMA 1 surface enclosures where located indoors in a dry, non-corrosive, non-hazardous location. Fractional horsepower manual motor starters shall be installed in NEMA 4/4X enclosures where located outdoors or in wet locations. Starters shall include handle guard/lock off feature to permit pad locking the device in the off position. Acceptable Fractional horsepower manual motor starter products are General Electric - CR101, Square D - Class 2510, Cutler-Hammer – MS, or approved equal.

D. Safety Switches. Furnish and install a safety switches as detailed on the Plans and specified herein. Safety switches shall be heavy duty, UL-listed, with amperage, voltage, number of poles, and type (fusible or not fusible), and accessories as detailed on the Plans. Safety switches shall be pad lockable in the off position. Include ground lugs or grounding kits with all safety switches. Safety switches located indoors in dry, non-corrosive, non-hazardous areas shall be in NEMA 1 or NEMA 12 enclosures. Safety switches located outdoors or in damp areas shall be in NEMA 3R and 12 or NEMA 4X enclosures without knockouts. Safety switches located in hazardous areas shall be suitable for the respective location. Safety switches shall be manufactured by Square D, or approved equivalent.

E. Electrical Metallic Tubing (EMT). Electrical Metallic Tubing shall be galvanized steel tubing conforming to ANSI C80.3 and U.L. 797. Electrical Metallic Tubing shall be as manufactured by Allied Tube and Conduit Corporation, or equal. All EMT and mounting hardware shall be constructed of corrosion resistant materials and be listed for use in wet

locations. EMT fittings, couplings and connectors shall be steel compression type. Set screw fittings will not be allowed. Steel used to manufacture conduits shall be 100 percent domestic steel. Contractor shall provide certification that the respective steel conduits used on this project are manufactured from 100 percent domestic steel.

F. Galvanized Rigid Steel Conduit. Rigid Steel Conduit and fittings shall be hot-dipped, galvanized, UL-listed, and produced in accordance with UL Standard 6 – Rigid Metal Conduit and ANSI C80.1 – Rigid Steel Conduit, Zinc Coated. Couplings, connectors, and fittings for rigid steel conduit shall be threaded, galvanized steel or galvanized, malleable iron, specifically designed and manufactured for the purpose. Fittings shall conform to ANSI C80.4 – Fittings Rigid Metal Conduit and EMT and UL 514B – Conduit, Tubing, and Cable Fittings. Set screw type fittings are not acceptable.

G. Schedule 40 PVC and Schedule 80 PVC Conduit. Conduit shall be Schedule 40 PVC or Schedule 80, 90 C, UL-rated or approved equal. Material shall comply with NEMA Specification TC-2 (Conduit), TC-3 (Fittings-UL-514), and UL-651 (Standard for rigid nonmetallic conduit). The conduit and fittings shall carry a UL label (on each 10 ft length of conduit and stamped or molded on every fitting). Conduit and fittings shall be identified for type and manufacturer and shall be traceable to location of plant and date manufactured. The markings shall be legible and permanent. The conduit shall be made from polyvinyl chloride C-300 compound which includes inert modifiers to improve weatherability, heat distortion. Clean rework material, generated by the manufacturer's own conduit production, may be used by the same manufacturer, provided the end products meet the requirements of this Specification. The conduit and fittings shall be homogeneous plastic material free from visible cracks, holes, or foreign inclusions. The conduit bore shall be smooth and free of blisters, nicks or other imperfections which could mar conductors or cables. Conduit, fittings and cement shall be produced by the same manufacturer to assure system integrity and shall be Carlon Plus 40, Plus 80 conduit, or approved equal.

H. Surface Non-metallic Raceway. One, Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC with texture and color selected by Resident Engineer from manufacturer's standard colors. Product shall comply with UL 94 V-0 requirements for self-extinguishing characteristics. Products by Hubble Panduit, Legrand/Wiremold or approved equal.

II. Conductors

A. XHHW Wire. Cable shall be UL-listed as Type XHHW-2 per UL Standard 44 for Rubber-Insulated wires and cables. Cable shall also conform to ICEA S-95-658/NEMA WC70 and Federal Specification J-C-30B. Conductors shall be Class B stranded annealed uncoated copper per UL Standard 44. Insulation shall be rated for 600-Volt. Insulation shall be cross-linked polyethylene complying with the physical and electrical requirements of UL Standard 44 for Type XHHW-2. Service conductors shall be Service Wire Company, Type XHHW-2, or approved equal.

B. THWN Wire. Cable shall be 1/C sized as indicated on the Plans. Cable shall comply with Underwriters' Laboratories Standard UL-83 and shall be UL-listed as VW-1. Conductor shall be soft annealed uncoated copper and shall comply with ASTM B3 and B8. Insulation shall be rated for 600-Volt. Insulation shall be polyvinyl-chloride conforming to Underwriters' Laboratories requirements for Type THW. The outer

covering shall be nylon conforming to Underwriters' Laboratories for type THHN or THWN-2. Cable shall be UL-listed and marked THWN. Power and control wiring shall be Southwire Type THWN-2, or approved equal.

III. Supporting Devices

A. Strut supports for interior or exterior applications shall be strut support, Unistrut P-1000 or approved equal. Provide necessary hardware, such as floor flanges, etc., as required to install equipment as specified and as shown on the Plans.
B. Provide materials, sizes and types of anchors, fasteners, and supports necessary to carry the loads of equipment and conduits. Consider weights of conduit when selecting products.

C. Fasteners and anchors shall be corrosion resistant, stainless steel. Where suitable, nonmetallic clamps and fasteners may be used.

D. Cable hangers shall be heavy duty nylon saddle rack with 3 in. throat opening Underground devices, Northbrook, IL, Cat. No. 3SR1 or 3SR2. Cable hangers shall be adequately sized to accommodate the respective cables. Secure cables to cable hangers with corrosion resistant cable ties.

IV. Lighting

Lighting Fixtures and lamps shall be as designated in "Lighting Fixture Schedule" on the Plans. Provide fixtures complete with all required accessories. Provide conduit and wiring as detailed on the Plans. Fixture wiring shall comply with fixture manufacturer's recommendations and the NEC requirements. Mounting Hardware: Provide mounting hardware to supplement building structure for support of fixtures. Supports shall be capable of supporting 300 percent fixture and lamp weight. Emergency lighting system consists of selected fixtures as indicated on Plans. Emergency lighting fluorescent fixtures shall be self-contained, modular, battery-inverter unit factory-mounted within fixture body. Comply with UL 924, and include the following features:

A. Test Switch and Light-Emitting Diode Indicator Light: Visible and accessible without opening fixture or entering ceiling space.

B. Battery: Sealed, maintenance-free, nickel-cadmium type with minimum 10-year nominal life.

C. Charger: Fully automatic, solid-state, constant-current type.

D. Operation: Relay automatically energizes lamp from unit when normal supply circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamp, and battery is automatically recharged and floated on charger.

V. Outlets

A. General Purpose Receptacles. General purpose receptacles for all wall-type convenience outlets in non-hazardous areas shall be of the 20-Amp, 125-volt, 3-wire grounding type, NEMA 5-20R, heavy-duty specification-grade **ivory** in color, Arrow Hart Part Number 5362, Bryant Part Number 5362, Hubbell Part Number 5362, Pass & Seymour Part Number 5362, or approved equal. Cover plates for flush-mounted, general purpose

receptacles shall be of the stainless steel type as manufactured by Arrow Hart, Bryant, Hubbell, Pass & Seymour, or approved equal.

B. GFCI Receptacles. Receptacles with ground-fault circuit interrupters shall be provided and installed where noted on the Plans. Ground-fault circuit interrupter receptacles shall be rated 120 VAC, 60 HZ, 20 Amps, specification-grade with NEMA 5-20R receptacle configuration and a trip threshold of 5±1 milliamps. Ground fault circuit interrupter receptacles shall be UL Class "A" ground-fault interrupter receptacle units complying with and tested in accordance with UL Standard No. 943. Ground fault circuit interrupter receptacles shall be Arrow Hart Part Number GF5342, Bryant Part Number GFR53FT, Hubbell Part Number GF5362, Pass & Seymour Part Number 2091-S, or approved equal.

C. Device Boxes. Device boxes for flush-mounted, non-hazardous receptacles and switches shall be sheet steel construction. Cover plates shall be stainless steel, as manufactured by Arrow Hart, Bryant, Hubbell, Pass & Seymour, or approved equal. Surface-mount device boxes in unfinished spaces shall be of cast aluminum or malleable iron FS design with cover plates of surface-mount FS design, as manufactured by Appleton, Crouse Hinds, or equal. Weatherproof covers shall be industrial grade, rain-tight NEMA 3R (while outlet is in use, as well as when not in use), UL-listed, FS box-mountable, weatherproof covers, TayMac Corporation Catalog No. 20550, or approved equal. Provide non-metallic boxes in finished spaces to match surface non-metallic raceway by Hubbell, Panduit, Wiremold/Legrand or approved equals.

VI. Switches

A. Toggle Switches. Single-pole toggle switches shall be 20-Amp, 120-volt, specification-grade, as manufactured by Arrow Hart, Bryant, Hubbell, Pass & Seymour, or approved equal. Single-pole, 20-Amp, 120-Volt toggle switches shall be Arrow Hart Part Number 1991, Bryant Part Number 4901, Hubbell Part Number 1220, Pass & Seymour Part Number 20AC1, or approved equal.

VII. Indoor Occupancy Sensors

A. General Requirements for Sensors: Wall- or ceiling-mounted, solid-state indoor occupancy sensors with a separate power pack.

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Operation: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
3. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor is powered from the power pack.
4. Mounting:

    a. Sensor: Suitable for mounting in any position on a standard outlet box.
    b. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.

5. Indicator: Digital display, to show when motion is detected during testing and normal operation of sensor.

6. Bypass Switch: Override the "on" function in case of sensor failure.

B. Switchbox-Mounted Occupancy Sensors

1. General Requirements for Sensors: Automatic-wall-switch occupancy sensor, suitable for mounting in a single gang switchbox.

a. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
b. Operating Ambient Conditions: Dry interior conditions, 32 to 120 deg F.
c. Switch Rating: Not less than 800-VA fluorescent at 120 V

2. Wall-Switch Sensor:

a. Standard Range: 180-degree field of view, field adjustable from 180 to 40 degrees; with a minimum coverage area of 900 sq. ft.
b. Sensing Technology: Dual technology - PIR and ultrasonic.
c. Switch Type: SP, field selectable automatic "on," or manual "on" automatic "off."
d. Voltage: Dual voltage, 120V; passive-infrared dual-technology type.
e. Concealed, field-adjustable, "off" time-delay selector at up to 30 minutes.
f. Concealed "off" time-delay selector at 30 seconds, and 5, 10, and 20 minutes.
g. Adaptive Technology: Self-adjusting circuitry detects and memorizes usage patterns of the space and helps eliminate false "off" switching.

3. Products by Hubbell, Sensor Switch, Watt Stopper or approved equal.

C. Device Boxes. Device boxes for flush-mounted, non-hazardous receptacles and switches shall be sheet steel construction. Surface mount device boxes in unfinished spaces for receptacles and toggle switches shall be die cast construction weatherproof boxes as manufactured by Appleton, Crouse Hinds, Hubbell/RACO/Bell or approved equal. Cover plates shall be stainless steel as manufactured by Arrow Hart, Bryant, Hubbell, Pass & Seymour, or approved equal.

VIII. Digital, Addressable Fire-Alarm System

A. System Description

1. Noncoded, UL-certified addressable system, with multiplexed signal transmission, dedicated to fire-alarm service only.

B. Summary

1. Section Includes:

a. Fire-alarm control unit.
b. Manual fire-alarm boxes.
c. Notification appliances.
d. Remote annunciator.

e. Addressable interface device.
f. Digital alarm communicator transmitter.

C. Quality Assurance

1. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.
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. NFPA Certification: Obtain certification according to NFPA 72 by a UL-listed alarm company.

D. Products by:

1. NOTIFIER; a Honeywell company.
2. Siemens Building Technologies, Inc.; Fire Safety Division.
3. SimplexGrinnell LP; a Tyco International company.
4. Honeywell.
5. Or approved equal.

E. Software Service Agreement

1. Comply with UL 864.
2. Technical Support: Beginning with Substantial Completion, provide software support for two (2) years.
3. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two (2) years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software:

    a. Provide ten (10) days' notice to Department to allow scheduling and access to system and to allow Department to upgrade computer equipment if necessary.

F. Systems Operational Description

1. Fire-alarm signal initiation shall be by one (1) or more of the following devices:

    a. Manual stations.
    b. Retain one or both of first two subparagraphs below. Coordinate with Drawings if retaining both.
    c. Smoke detectors.
    d. Duct smoke detectors.

2. Fire-alarm signal shall initiate the following actions:

    a. Continuously operate alarm notification appliances.
    b. Identify alarm at fire-alarm control unit and remote annunciators.
    c. Transmit an alarm signal to the remote alarm receiving station.

d. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.
e. Record events in the system memory.

3. System trouble signal initiation shall be by one (1) or more of the following devices and actions:

a. Open circuits, shorts, and grounds in designated circuits.
b. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
c. Loss of primary power at fire-alarm control unit.
d. Ground or a single break in fire-alarm control unit internal circuits.
e. Abnormal ac voltage at fire-alarm control unit.
f. Break in standby battery circuitry.
g. Failure of battery charging.
h. Abnormal position of any switch at fire-alarm control unit or annunciator.

4. System Trouble and Supervisory Signal Actions: Initiate notification appliance and annunciate at fire-alarm control unit and remote annunciators.

G. Fire-Alarm Control Unit

1. General Requirements for Fire-Alarm Control Unit:

a. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864 and listed and labeled by an NRTL:

1) System software and programs shall be held in flash electrically erasable programmable read-only memory (EEPROM), retaining the information through failure of primary and secondary power supplies.
2) Include a real-time clock for time annotation of events on the event recorder and printer.

2. Addressable initiation devices that communicate device identity and status:

a. Smoke sensors shall additionally communicate sensitivity setting and allow for adjustment of sensitivity at fire-alarm control unit.
b. Temperature sensors shall additionally test for and communicate the sensitivity range of the device.

3. Addressable control circuits for operation of mechanical equipment.

H. Manual Fire-Alarm Boxes

1. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be

mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box:

a. Double-action mechanism requiring two (2) actions to initiate an alarm, breaking-glass or plastic-rod and pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
b. Station Reset: Key- or wrench-operated switch.

I. System Smoke Detectors

1. General Requirements for System Smoke Detectors:

a. Comply with UL 268; operating at 24-Volt dc, nominal.
b. In first subparagraph below, retain first option for additions to existing four-wire systems or if detector auxiliary contacts are used for critical control functions such as air-handler shutdowns. Otherwise, retain type based on class of initiating device circuit.
c. Detectors shall be two-wire type.
d. Retain one or both of first two subparagraphs below. If retaining both, indicate detector types on Drawings.
e. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
f. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
g. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
h. Integral Visual-Indicating Light: LED type indicating detector has operated and power-on status.
i. Retain subparagraph below for analog-addressable system where remotely adjustable detectors are to be used.
j. Remote Control: Unless otherwise indicated, detectors shall be analog-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire-alarm control unit:

1) Rate-of-rise temperature characteristic shall be selectable at fire-alarm control unit for 15 or 20°F per minute.
2) Fixed-temperature sensing shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 or 155°F.
3) Number of settable levels in fire-alarm control unit varies among manufacturers and between detector types. Indicate specific number of levels on Drawings or in "Remarks" column of a detector schedule.
4) Provide multiple levels of detection sensitivity for each sensor.

2. Photoelectric Smoke Detectors:

a. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
b. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

1) Primary status.
2) Device type.
3) Present average value.
4) Present sensitivity selected.
5) Sensor range (normal, dirty, etc.).

3. Ionization Smoke Detector:

a. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
b. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

1) Primary status.
2) Device type.
3) Present average value.
4) Present sensitivity selected.
5) Sensor range (normal, dirty, etc.).

J. Notification Appliances

1. General Requirements for Notification Appliances: Connected to notification appliance signal circuits, zoned as indicated, equipped for mounting as indicated and with screw terminals for system connections:

a. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated and with screw terminals for system connections.

2. Horns: Electric-vibrating-polarized type, 24-Volt dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 ftfrom the horn, using the coded signal prescribed in UL 464 test protocol.
3. Visible Notification Appliances: Xenon strobe lights comply with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-in.- high letters on the lens:

a. Rated Light Output:

1) 15/30/75/110 cd, selectable in the field.

b. Mounting: Wall mounted unless otherwise indicated.
c. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.

d. Flashing shall be in a temporal pattern, synchronized with other units.
e. Strobe Leads: Factory connected to screw terminals.
f. Mounting Faceplate: Factory finished, white.

K. Addressable Interface Device

1. Description: Microelectronic monitor module, NRTL listed for use in providing a system address for alarm-initiating devices for wired applications with normally open contacts.
2. Integral Relay: Capable of providing a direct signal to elevator controller to initiate elevator recall.

L. Remote Annunciator

1. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing:

   a. Mounting: Flush cabinet, NEMA 250, Type 1.

2. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

M. Digital Alarm Communicator Transmitter

1. Digital alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL 632 and be listed and labeled by an NRTL.
2. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture two (2) telephone line(s) and dial a preset number for a remove central station. When contact is made with central station(s), signals shall be transmitted. If service on either line is interrupted for longer than forty-five (45) seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both telephone lines, transmitter shall initiate the local trouble signal.
3. Local functions and display at the digital alarm communicator transmitter shall include the following:

   a. Verification that both telephone lines are available.
   b. Programming device.
   c. LED display.
   d. Manual test report function and manual transmission clear indication.
   e. Communications failure with the central station or fire-alarm control unit.

4. Digital data transmission shall include the following:

a. Address of the alarm-initiating device.
b. Address of the supervisory signal.
c. Address of the trouble-initiating device.
d. Loss of ac supply or loss of power.
e. Low battery.
f. Abnormal test signal.
g. Communication bus failure.

5. Secondary Power: Integral rechargeable battery and automatic charger.
6. Self-Test: Conducted automatically every twenty-four (24) hours with report transmitted to central station.

N. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu:

1. Annunciator and Display: Liquid-crystal type, two (2) line(s) of forty (40) characters, minimum.
2. Keypad: Arranged to permit entry and execution of programming, display, and control commands and to indicate control commands to be entered into the system for control of smoke-detector sensitivity and other parameters.

O. Circuits:

1. Initiating Device, Notification Appliance, and Signaling Line Circuits: NFPA 72, Class B.

P. Smoke-Alarm Verification:

1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.
2. Activate an NRTL-listed and -approved "alarm-verification" sequence at fire-alarm control unit and detector.
3. Record events by the system printer.
4. Sound general alarm if the alarm is verified.
5. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.

Q. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory.

R. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station by digital communicator and telephone lines.

VIII. Premise Distribution System

A. Section Includes: Equipment, materials, labor, and services to provide Category 6 Telecommunications distribution system, including, but not limited to:

1. Raceway and boxes.
2. Telephone and data cabling terminations.
3. Telecommunications outlets.
4. Terminal blocks/cross-connect systems.
5. Equipment racks and cabinets.
6. System testing.
7. Documentation and submissions.
8. Grounding.

B. Work not included:

1. The following work will be done by others:

   a. Off-site services.
   b. Providing electrical wiring and outlets.
   c. Providing data concentrators, hubs, switches, servers, computers, and other active devices such as PBX's.
   d. Dam Control/Camera System and Lock Control System fiber optic network components.

C. Design, manufacture, test, and install telecommunications cabling networks per manufacturer's requirements and in accordance with NFPA-70 (*National Electrical Code*®), IEEE C2 (NESC), state codes, local codes, requirements of authorities having jurisdiction, and particularly the following standards:

ANSI/NECA/BICSI-568 -- Standard for Installing Commercial Building Telecommunications Cabling

ANSI/TIA/EIA Standards:

1. ANSI/TIA/EIA-568-B.1 -- *Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements.*
2. ANSI/TIA/EIA-568-B.2 -- *Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components.*
3. ANSI/TIA/EIA-568-B.3 -- *Optical Fiber Cabling Components Standard.*
4. ANSI/TIA/EIA-569-B -- *Commercial Building Standard for Telecommunications Pathways and Spaces.*
5. ANSI/TIA/EIA-606(A) -- *The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.*
6. ANSI-J-STD-607(A) -- *Commercial Building Grounding and Bonding Requirements for Telecommunications.*
7. TIA-526-7 –OFSTP-7 *Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant.*
8. TIA-526-14A –OFSTP-14 Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant.
9. ANSI/TIA/EIA-758(A) -- *Customer-Owned Outside Plant Telecommunications Cabling Standard.*
10. TIA TSB-140 Additional Guidelines for Field Testing Length, Loss.

D. The telecommunications cabling system generally consists of one (1) voice and one (1) telecommunications outlet in each workstation, wall telephones in common and mechanical areas, pathways, and patch panels located on each floor.

1. The typical work area consists of a single-gang plate with two (2) standards compliant work area outlets and two (2) blank spare ports.

2. One (1) work area outlet consists of two (2) 4-pair data Category 6 cables, installed from work area outlet to the Communications Rack. Terminate data cables on wall /rack mounted modular patch panels located in the appropriate Communications Rack.

3. Vertical/horizontal copper backbone cabling consists of multiple pair unshielded twisted-pair installed from the main cross-connect (MC) to the horizontal cross-connect (HC) and/or from the MC to the intermediate cross-connect (IC) to the HC.

4. Vertical/horizontal backbone cabling consists of 50/125 μm multimode optical fiber cable installed from the MC to the HC and/or from the MC to the IC to the HC data communications.

E. Provide Product By:

1. UTP Cable:

a. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1) Hubbell Premise Wiring
2) Leviton Voice and Data Division
3) Panduit Corp.
4) Siemon Co. (The)
5) Belden CDT Inc.: Electronics Division.
6) Berk-Tek; a Nexans company.
7) Nordex/CDT; a subsidiary of Cable Design Technologies.
8) Superior Essex Inc.
9) SYSTIMAX Solutions; a CommScope, Inc. brand.
10) 3M. Corp.
11) Tyco Electronics/AMP Netconnect; Tyco International Ltd.
12) Or approved equal.

2. UTP Cable Hardware:

a. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1) Hubbell Premise Wiring
2) Leviton Voice and Data Division
3) Panduit Corp. Siemon Co. (The)
4) Siemon Co. (The).
5) Belden CDT Inc.: Electronics Division.

6) Berk-Tek; a Nexans company.
7) Nordex/CDT; a subsidiary of Cable Design Technologies.
8) Superior Essex Inc.
9) SYSTIMAX Solutions; a CommScope, Inc. brand.
10) 3M. Corp.
11) Tyco Electronics/AMP Netconnect; Tyco International Ltd.
12) Or approved equal.

3. Coaxial Cable:

a. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1) Alpha Wire Company.
2) Belden CDT Inc.: Electronics Division.
3) CommScope, Inc.
4) Or approved equal.

4. Coaxial Cable Hardware:

a. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1) Alpha Wire Company.
2) Belden CDT Inc.: Electronics Division.
3) CommScope, Inc.

F. Cable Support: NRTL labeled. Cable support brackets shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Cable tie slots fasten cable ties to brackets:

1. Comply with NFPA 70 and Underwriters Laboratories, Inc. (UL) 2043 for fire-resistant and low-smoke-producing characteristics.
2. Support brackets with cable tie slots for fastening cable ties to brackets.
3. Lacing bars, spools, J-hooks, and D-rings.
4. Straps and other devices.

G. Conduit and Boxes: Comply with requirements in this Special Provision:

1. Outlet boxes shall be no smaller than 4 in. wide, 4 in. high, and 2-1/2 in. deep, including plaster rings to match outlets.

H. Fabricate custom-made equipment with careful consideration given to aesthetic, technical, and functional aspects of equipment and its installation.

I. Provide products that are suitable for intended use, including, but not limited to environmental, regulatory, and electrical.

J. Voice and Data Station Cable (Copper)

1. Solid copper,22 AWG to 24 AWG, 100 Ω balanced twisted-pair (UTP) Category 6 cables with four individually twisted-pairs, which meet or exceed the mechanical and transmission performance specifications in ISO/IEC 11801: 2007 up to 500 MHz.

    a. Note: Listed Type CMP.

K. Patch Cords:

1. Provide color Category 6 patch cords, using the methods stated in Part 3 568B wiring, and RJ-45 connectors. Refer to construction documents for station and patch-cable requirements. Provide number of patch cords to meet needs of project plus 10 percent spare.
2. Patch Cord Jackets shall be ivory for voice/data. Patch cords shall be factory assembled.
3. Patch Cords: Four (4) pair category 3 and 6 cables in 3 ft, 5 ft, 7 ft, 10 ft, 15 ft, and 20 ft lengths as required to meet needs of project.

L. Voice/Data – Work Area Outlets (Copper Only)

1. Single-gang mounting plate with four (4) openings containing the following devices:

    a. Voice Outlet – 8-pin modular, Category 6, unkeyed, grey, pinned to T568B standards.
    b. Data Outlet – 8-pin modular, Category 6, unkeyed, blue, pinned to T568 standards.

M. Wall Voice Outlets

1. Single-gang stainless steel faceplate with 6-conductor jack and wall telephone mounting lugs.

N. Termination Blocks

1. Product(s) as approved by the engineer/designer: Wiring blocks are to be in following configurations:

    a. List dimensional configurations.
    b. ER – List pairs connectorized for PBX portion of ER and pairs field terminated for backbone and CO portion of ER:

        1) Provide wiring troughs between ER frame sections.

O. Patch Panels

1. 19 in. rack mountable, 48-port 8-pin modular to insulation displacement connector (IDC) meeting Category 6 performance standards.

P. Equipment Frames

1. General Frame Requirements:

    a. Distribution Frames: Freestanding, modular-steel units designed for telecommunications terminal support and coordinated with dimensions of units to be supported.
    b. Module Dimension: Width compatible with EIA 310 standard, 19 in. panel mounting.
    c. Finish: Manufacturer's standard, baked-polyester powder coat.

2. Wall-Mounted Racks: Modular-type, aluminum construction:

    a. Vertical and horizontal cable management channels, top and bottom cable troughs, grounding lug, and a power strip.
    b. Baked-polyester powder coat finish.

3. Cable Management for Equipment Frames:

    a. Metal, with integral wire retaining fingers.
    b. Baked-polyester powder coat finish.
    c. Vertical cable management panels shall have front and rear channels, with covers.
    d. Provide horizontal crossover cable manager at the top of each relay rack, with a minimum height of two (2) rack units each.

Q. Power Strips

1. Comply with UL 1363:

    a. Rack mounting.
    b. Six (6) 20-A, 120-Volt ac, NEMA WD 6, Configuration 5-20R receptacles.
    c. LED indicator lights for power and protection status.
    d. LED indicator lights for reverse polarity and open outlet ground.
    e. Retain one of first two subparagraphs below.
    f. Circuit Breaker and Thermal Fusing: When protection is lost, circuit opens and cannot be reset.
    g. Circuit Breaker and Thermal Fusing: Unit continues to supply power if protection is lost.
    h. Cord connected with 15 ft line cord.
    i. Rocker-type on-off switch, illuminated when in on position.
    j. Retain two subparagraphs below if power strips contain surge protection. In first subparagraph, retain 33 kA for high exposure and cost, 26 kA for medium exposure and cost, and 13 kA for low exposure and cost.
    k. Peak Single-Impulse Surge Current Rating: 33 kA per phase.
    l. Protection modes shall be line to neutral, line to ground, and neutral to ground. UL 1449 clamping voltage for all three (3) modes shall be not more than 330-Volts.

IX. Ground Bus

A. Ground bus for the vault interior shall be 1/4 in. thick by 2 in. wide Copper bus bar, as manufactured by Harger Lightning Protection Inc., Gus Berthold Electric Company, or approved equivalent. Ground bus shall include standoffs, insulators, splices, bonding jumpers, mounting hardware, etc., as required for the respective application. Splices for 1/4 in. thick by 2 in. wide bus bar shall be with manufacturers splice plates and stainless nuts, bolts, and washers. Exothermic weld connections are also acceptable splices for the ground bus. Splice plates shall be bolt through type Copper with minimum dimensions 1/4 in. thick by 2 in. wide by 6 in. length with 4 bolts. Include an engraved phenolic or plastic legend plate 1/2-in. high white letters on a green background labeled "COMMUNICATIONS GROUND BUS". All cable connections to the ground bus shall be with two-hole tongue, long barrel compression lugs bolted to the bus bar, as detailed on the Plans.

X. Ground Rods

A. Ground rods for the Building ground field shall be 3/4-in. diameter, 10 ft long, UL-listed, Copper-clad Ground rods shall have 10 mils minimum Copper coating. Ground rods shall be manufactured in the United States of America. Steel used to manufacture ground rods shall be 100 percent domestic steel.

XI. Junction and Pull Boxes

A. Junction and pull boxes shall be sized, as required for conductors and splices and per 2011 NEC Article 314. Boxes shall be UL-listed. Special boxes made to suit conditions shall be used to accommodate the respective application, or where required by the NEC, even though they might not be indicated on the Drawings. Surface-mounted exterior junction and pull boxes located in non-hazardous, non-classified areas shall be NEMA 4X stainless steel or aluminum, Crouse-Hinds, Killark, Hoffman, Hennessy, or equal.

CONSTRUCTION METHODS

I. Installation of Fire Alarm System

A. Comply with NFPA 72 for installation of fire-alarm equipment.

B. Equipment Mounting: Install fire-alarm control unit on wall with tops of cabinets not more than 72 in. above the finished floor:

1. Mount control panel to wall according to manufacturer's requirements.

C. Install wall-mounted equipment, with tops of cabinets not more than 72 inches above the finished floor.

D. Smoke Detector Spacing:

1. Comply with NFPA 72, "Smoke-Sensing Fire Detectors" Section in the "Initiating Devices" Chapter, for smoke-detector spacing.
2. Smooth ceiling spacing shall not exceed 30 ft.
3. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Appendix Ain NFPA 72.

4. HVAC: Locate detectors not closer than 3 ft from air-supply diffuser or return-air opening.
5. Lighting Fixtures: Locate detectors not closer than 12 in. from any part of a lighting fixture.

E. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct.

F. Remote Status and Alarm Indicators: Install near each smoke detector and each sprinkler water-flow switch and valve-tamper switch that is not readily visible from normal viewing position.

G. Audible Alarm-Indicating Devices: Install not less than 6 in.below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille.

H. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 in. below the ceiling.

I. Device Location-Indicating Lights: Locate in public space near the device they monitor.

J. Fire-Alarm Control Unit: Surface mounted, with tops of cabinets not more than 72 in. above the finished floor.

K. Annunciator: Install with top of panel not more than 72 in. above the finished floor.

L. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Division 08 Section "Door Hardware." Connect hardware and devices to fire-alarm system:

1. Verify that hardware and devices are NRTL listed for use with fire-alarm system in this Section before making connections.

M. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 3 ft from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.

N. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in this Special Provision.

O. Install framed instructions in a location visible from fire-alarm control unit.

P. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

Q. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

R. Tests and Inspections:

1. Visual Inspection: Conduct visual inspection prior to testing:

    a. Inspection shall be based on completed Record Drawings and system documentation that is required by NFPA 72 in its "Completion Documents, Preparation" Table in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter.
    b. Comply with "Visual Inspection Frequencies" Table in the "Inspection" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.

2. System Testing: Comply with "Test Methods" Table in the "Testing" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
7. Provide ampere draw on each signal (horn and strobe) circuit.
8. Test, measure, and record audible sound levels (dB) for each horn.

S. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.

T. Fire-alarm system will be considered defective if it does not pass tests and inspections.

U. Prepare test and inspection reports.

V. Annual Test and Inspection: One (1) year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

W. Engage a factory-authorized service representative to train Department's maintenance personnel to adjust, operate, and maintain fire-alarm system. Provide two (2) two (2) hour sessions.

II. Installation of Premise Distribution system

A. The contractor shall be a factory- authorized cabling system installer, as recognized by the manufacturer of the equipment being provided.

B. The contractor shall have worked satisfactorily for a minimum of five (5) years on systems of this type and size.

C. Equipment and materials of the type for which there are independent standard testing requirements, listings, and labels, shall be listed and labeled by the independent testing laboratory.

D. Where equipment and materials have industry certification, labels, or standards (i.e., NEMA - National Electrical Manufacturers Association), this equipment shall be labeled as certified or complying with standards.

E. Material and equipment shall be new, and conform to grade, quality, and standards specified. Equipment and materials of the same type shall be a product of the same manufacturer throughout.

F. Unless otherwise specified, unconditionally guarantee in writing the materials, equipment, and workmanship for a period of not less than twenty-five (25) years from date of acceptance by the Department. The Department shall deem acceptance as beneficial use.

G. Transfer manufacturer's warranties to the Department in addition to the General System Guarantee. Submit these warranties on each item in list form with shop drawings. Detail specific parts within equipment that are subject to separate conditional warranty. Warranty proprietary equipment and systems involved in this contract during the guarantee period. Final payment shall not relieve you of these obligations.

H. Coordinate layout and installation of communications equipment with Department's telecommunications and LAN equipment and service suppliers. Coordinate service entrance arrangement with local telecommunications equipment and service supplier.

I. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

J. All network electronics, including Ethernet switch, will be Department furnished and installed.

K. Protect equipment during transit, storage, and handling to prevent damage, theft, soiling, and misalignment. Coordinate with the Department for secure storage of equipment and materials. Do not store equipment where conditions fall outside manufacturer's recommendations for environmental conditions. Do not install damaged equipment; remove from site and replace damaged equipment with new equipment.

L. Submit schedule for installation of equipment and cabling. Indicate delivery, installation, and testing for conformance to specific job completion dates. As a minimum, dates are to be provided for bid award, installation start date, completion of station cabling, completion of riser cabling, completion of testing and labeling, cutover, completion of the final punch list, start of demolition, Department acceptance, and demolition completion.

M. Use of the site shall be at the Department's direction in matters in which the Department deems it necessary to place restriction.

N. Access to building wherein the work is performed shall be as directed by the Department.

O. Schedule necessary shutdowns of plant services with the Department, and obtain written permission from the Department. Refer to article - *CONTINUITY OF SERVICES* herein.

P. Proceed with the work without interfering with ordinary use of streets, aisles, passages, exits, and operations of the Department.

Q. Take no action that will interfere with, or interrupt, existing building services unless previous arrangements have been made with the Engineer. Arrange the work to minimize shutdown time.

R. Department's personnel will perform shutdown of operating systems. The contractor shall give three (3) days' advance notice for systems shutdown.

S. Should services be inadvertently interrupted, immediately furnish labor, including overtime, material, and equipment necessary for prompt restoration of interrupted service.

T. Receive, check, unload, handle, store, and adequately protect equipment and materials to be installed as part of the contract. Store in areas as directed by the Engineer. Include delivery, unloading, setting in place, fastening to walls, floors, ceilings, or other structures where required, interconnecting wiring of system components, equipment alignment and adjustment, and other related work whether or not expressly defined herein.

U. Install materials and equipment in accordance with applicable standards, codes, requirements, and recommendations of national, state, and local authorities having jurisdiction, and *National Electrical Code*® (NEC) current edition in force and with manufacturer's printed instructions.

V. Adhere to manufacturer's published specifications for pulling tension, minimum bend radii, and sidewall pressure when installing cables:

1. Where manufacturer does not provide bending radii information, minimum-bending radius shall be fifteen (15) times cable diameter. Arrange and mount equipment and materials in a manner acceptable to the engineer and the Department.

W. Penetrations through floor and fire-rated walls shall utilize intermediate metallic conduit (IMC) or galvanized rigid conduit (GRC) sleeves and shall be firestopped after installation and testing, utilizing a firestopping assembly approved for that application.

X. Install station cabling to the nearest telecommunications room (TR), unless otherwise noted.

Y. Installation shall conform to the following basic guidelines:

1. Use of approved wire, cable, and wiring devices.
2. Neat and uncluttered wire termination.

Z. Route cables through cable tray and conduit, as noted on the plans. J-hooks are not acceptable.

AA. Install adequate support structures for 10 ft of service slack at each TR.

BB. Support riser cables every three (3) floors and at top of run with cable grips.

CC. Limit number of 4-pair data riser cables per grip to fifty (50).

DD. Install cables in one (1) continuous piece. Splices shall not be allowed except as indicated on the drawings.

EE. Provide overvoltage protection on both ends of cabling exposed to lightning or accidental contact with power conductors.

FF. Hook and latch fasteners will be used in lieu of cable ties.

GG. Service loops shall be made with a loose Figure “8” shape rather than circular.

HH. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

II. Comply with TIA/EIA-569-A, Annex A, "Firestopping."

JJ. Comply with BICSI TDMM, "Firestopping Systems" Article.

KK. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

LL. Comply with ANSI-J-STD-607-A.

MM. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2 in. clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.

NN. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

OO. Identification

1. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements in Division 26 Section "Identification for Electrical Systems." Comply with requirements in Division 09 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.

PP. Labels shall be preprinted or computer-printed type.

QQ. Labeling

1. Labeling shall conform to the school district’s and ANSI/TIA/EIA-606(A) standards. In addition, provide the following:
2. Label each outlet with permanent self-adhesive label with minimum 3/16 in. high characters.

a. Label each cable with permanent self-adhesive label with minimum, 1/8 in. high characters, in the following locations:

1) Inside receptacle box at the work area.
2) Behind the communication closet patch panel or punch block.

3. Use labels on face of data patch panels. Provide facility assignment records in a protective cover at each telecommunications closet location that is specific to the facilities terminated therein.
4. Use color-coded labels for each termination field that conforms to ANSI/TIA/EIA-606(A) standard color codes for termination blocks.
5. Labels shall be machine-printed. Hand-lettered labels shall not be acceptable.
6. Label cables, outlets, patch panels, and punch blocks, as detailed on the construction documents.
7. Mark up floor plans showing outlet locations, type, and cable marking of cables. Turn these drawings over to the Department two (2) weeks prior to move in to allow the Department's personnel to connect and test Department-provided equipment in a timely fashion:

a. Three (3) sets of as-built drawing shall be delivered to the Engineer within four (4) weeks of acceptance of project by the Department. A set of as-built drawings shall be provided to the Department in electronic form and utilizing CAD software that is acceptable to the Department. The electronic media shall be delivered to the Department within six (6) weeks of acceptance of project by Department.

RR. Testing

1. Testing shall conform to Category 6 and ANSI/TIA/EIA-568-B.1 standards. Testing shall be accomplished using manufacturer approved testers.
2. Test each pair and shield of each cable for opens, shorts, grounds, and pair reversal. Correct grounded, and reversed pairs. Examine open and shorted pairs to determine if problem is caused by improper termination. If termination is proper, tag bad pairs at both ends and note on termination sheets:

a. Perform testing of copper cables with tester meeting ANSI/TIA/EIA-568-B.1 requirements.
b. If copper backbone cable contains more than one (1) percent bad pairs, remove and replace entire cable.
c. If horizontal cable contains bad conductors or shield, remove and replace cable.

3. Perform optical time domain reflectometer (OTDR) testing on each fiber optic conductor. Measured results shall be plus/minus 1 dB of submitted loss budget calculations:

a. Submit printout for each cable tested.
b. Submit electronic media with test results and program to view results.

4. Where any portion of system does not meet the specifications, correct deviation and repeat applicable testing at no additional cost to the Department.

SS. Field Quality Control

1. Employ job superintendent or project manager during the course of the installation to provide coordination of work of this specification and of other trades, and provide technical information when requested by other trades. This person shall maintain current RCDD® (Registered Communications Distribution Designer) registration or industry equivalent certified installer and shall be responsible for quality control during installation, equipment set-up, and testing.
2. Installation personnel shall meet manufacturer's training and education requirements for implementation of extended warranty program.

III. Locate Existing Utilities

A. The location, size, and type of material of existing underground and/or aboveground utilities indicated on the Plans are not represented as being accurate, sufficient, or complete. Neither the Department nor the Engineer assumes any responsibility whatever in respect to the accuracy, completeness, or sufficiency of the information. There is no guarantee, either expressed or implied, that the locations, size, and type of material of existing underground utilities indicated are representative of those to be encountered in the construction. It shall be the Contractor's responsibility to determine the actual location of all such facilities, including service connections to underground utilities. Prior to construction, the Contractor shall notify the utility companies of his operational plans, and shall obtain from the respective utility companies detailed information and assistance relative to the location of their facilities and the working schedule of the companies for removal or adjustment, where required. In the event an unexpected utility interference is encountered during construction, the Contractor shall immediately notify the utility company of jurisdiction. The Engineer shall also be immediately notified. Any damage to such mains and services shall be restored to service at once and paid for by the Contractor at no additional cost to the Contract.

B. Contact JULIE (Joint Utility Location Information for Excavation) for utility information, phone: 1-800-892-0123.

IV. Installation of Conduits

A. All exterior above grade exposed conduit shall be galvanized rigid steel (GRSC).

B. All interior conduit serving branch circuits 1 in. and below will be EMT. All interior conduits exposed or larger than 1 in. will be rigid galvanized steel.

C. All work shall be laid out with sleeves for openings through slabs, building walls, etc., as required. If sleeves and inserts are not properly installed, the Contractor will be required to do all necessary cutting and patching to accommodate conduits.

D. Conduit size and fill requirements shall comply with Chapter 9 and Annex C of the NEC. It should be noted these are minimum requirements and larger conduit sizes or smaller fill requirements shall be used whenever specified or detailed on the Plans.

E. Ream conduits only after threads are cut. Cut joints square to butt solidly into couplings. Where necessary to join two pieces of conduit and it is impossible to use standard

coupling, use 3-piece malleable iron conduit coupling. The use of running thread is prohibited. This applies to all rigid conduit installations, underground or otherwise.

F. Make all joints in steel underground conduit water-tight with approved joint compound. Temporarily plug conduit openings to exclude water, concrete or any foreign materials during construction. Clean conduit runs before pulling in conductors.

G. Hickey bends will not be acceptable for conduits 1-in. and larger. Use manufactured elbows or bends fabricated with bending machine. Field bending of all PVC conduit shall be accomplished with the use of equipment approved by the conduit manufacturer. Open flame bending equipment will not be acceptable.

H. A run of conduit between a junction box, pull box, and/or fitting shall not contain more than the equivalent of four (4) quarter bends, including bends immediately at the respective box or fitting.

I. Where conduits enter a box or fitting, provide a steel locknut and an insulated metallic bushing. Use this method to terminate conduit in panels, pull boxes, safety switches, etc. Conduit terminations in service equipment shall have grounding bushings with ground wire connections between the bushing and the ground bus.

J. Run exposed conduits parallel with respective walls or supporting structure and at right angles to the respective building, vault, etc., not diagonally. Make bends and turns with pull boxes or hot-dipped galvanized malleable iron fittings and covers.

K. Conduit terminations shall include bushings to protect cables and wires from damage from conduit.

L. Set screw type fittings are prohibited. Use compression fitting for EMT conduits.

M. Use only screws, bolts, washers, etc. fabricated from rust resisting metals for the supporting of boxes.

N. Schedule 40 PVC conduit and/or sleeves shall be used for grounding electrode conductors.

O. Metal conduit in direct contact with earth or concrete shall be Schedule 40 PVC conduit.

P. Underground conduits shall be minimum 36-in. below grade. Where shown on the Plans or where required to avoid obstructions and/or interferences with other underground utilities, deeper burial depths may be required.

Q. Conduits shall be kept clean of concrete, dirt, or foreign substances during storage and construction. After conduit installation, a standard flexible mandrel shall be used for cleaning followed by a brush with stiff bristles. Mandrel shall be at least 12-in. long and have a diameter 1/4 in. less than the inside diameter of the conduit being cleaned. All obstructions in conduits shall be removed prior to pulling wires or final acceptance. Conduits unable to pass mandrel shall be replaced. All unused conduits shall be capped.

R. Trench widths shall be held to a minimum.

S. Examine all available site utility information in regard to existing utility lines and locate and protect existing lines. Repair all existing utility lines that are damaged by this construction.

T. All excavations shall be barricaded, lighted (where applicable) and protected during construction.

U. Contractor shall backfill all excavations.

V. Installation of Wire and Cable

A. Wire and cable shall be installed using accepted industry methods to prevent damage to conductors and insulation. Installation shall comply with all applicable sections of the NEC regarding conduit fill.

B. No splices shall be permitted in conduit bodies. All splices shall be made in junction boxes provided for that purpose as detailed or required by need.

C. All conduits shall be swabbed until all moisture and grit is removed before any wires are pulled.

D. Manufacturers recommended pulling tension shall not be exceeded during conductor installation. Use approved pulling lubricant on long pulls or when pulling No. 4 or larger wire.

E. Neatly train and lace wiring inside boxes, equipment and panelboards.

F. Color code conductor insulation for #6 AWG and smaller. Color code conductors with tape or colored insulation for #4 AWG and larger. Where conductors are color coded with tape, they shall be identified (color coded) at all points of access. Insulated ground wires shall have green colored insulation for all conductor AWG and/or Kcmil to comply with NEC 250.119. Neutral conductors shall have white colored insulation for No. 6 AWG and smaller to meet the requirements of NEC 200.6. Color coding shall be as follows:

120/240 VAC, 1-PHASE, 3-WIRE

Phase A – Black
Phase B – Red
Phase C – Blue
Neutral – White
Ground - Green

G. Splicing 600 volt wire shall be as follows:

1. Wire #8 and smaller:

a) Ideal “wing nut” type insulated connectors.
b) Scotchlok R, B, and Y type insulated connectors.
c) Thomas and Betts, PT-1, PT-2, and PT-3 insulated connectors.

2. Wire #6 and larger:

   a) For straightway connections, use compression connector with rubber shrink type insulating cover.
   b) For tee cable taps, use compression connector with rubber shrink type insulating cover.
   c) For taps in cutout cabinets, gutters, and other close locations, use O.Z., Burndy, or PLM fittings, type "PT" cable tape with type "PTC" insulating cover.

3. Use plastic tape on all uninsulated wire splices manufactured by Scotch, Okonite, Brady Co. or Plymouth.

4. Splice only in accessible junction or outlet boxes.

H. Connections and Terminations shall be as follows:

1. Identify each conductor in pump/motor control panels, panelboards, junction or pull boxes, or troughs with a permanent pressure sensitive label with suitable numbers or letters for easy recognition. Identify control wiring at each end and in junction boxes with numeric wire number corresponding to control wiring diagram.
2. Thoroughly clean wire before installing lugs and connectors.
3. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.
4. Terminate spare conductors with electrical tape and roll up in box. Label spare conductors "SPARE."

I. Inspect wiring for physical damage and proper connection. All wire and cable shall be tested for continuity and short circuits prior to energizing circuits. Verify proper phasing where applicable.

V Installation Of Supporting Devices

A. Install products in conformance with manufacturer's instructions and as detailed on the Plans. Provide anchors, fasteners and supports in accordance with NECA Standard of Installation, and as recommended by the equipment manufacturer for the respective application.

B. Do not fasten/secure supports to pipes, ducts, mechanical equipment, or conduit. Do not use spring steel clips or clamps. Install surface-mounted cabinets, enclosures and panelboards with a minimum of four (4) anchors. Use spring-lock washers under all nuts. All supports installed in the wet well and/or valve vault shall be corrosion resistant. Install supports with stainless steel hardware.

C. Concrete work associated with support structures shall conform to Section 1020 PORTLAND CEMENT CONCRETE of the Standard Specifications for Road and Bridge Construction and as detailed on the Plans.

VI. Installation of Panelboards

Panelboards shall be thoroughly inspected for physical damage, proper alignment, anchorage, and grounding. The exterior finish shall be inspected for blemishes, nicks, and bare spots and touched up, as required, using matching touch-up paint. Inspections shall be made for proper installation and tightness of connections for circuit breakers. Install panelboards, as shown on the Plans and in accordance with NEMA PB1.1. Maximum distance from floor to highest breaker shall not exceed 6 ft-6 in. Install panelboards plumb. Install circuit breakers in panelboards in conformance with the respective manufacturer's directions. Connect only one wire/cable to each breaker terminal. Provide filler plates for unused spaces in panelboards. Provide typed circuit directory for each branch circuit panelboard to identify the respective device fed by each circuit breaker. Revise directory to reflect circuiting changes, as required. Provide legend plates for all panelboards to identify the panelboard designation, the power source, and the voltage system. Legend plates shall be weatherproof and abrasion-resistant, phenolic material. Lettering shall be black on white background. Panelboards shall be thoroughly tested after installation and connection to respective loads.

VII. Surge Arrester Installation

Install Surge Protector Devices (SPD)/TVSS devices in conformance with the respective manufacturer's directions and recommendations. Contractor shall confirm all connections to the surge arrester (phases, neutral, and ground) are completed and secure. Connection leads to the surge arrester shall be sized per the respective manufacturer's recommendation and as detailed herein, and shall be maintained as short as possible, maximum 2 ft in length, and laced together for mutual coupling. The conduit or conduit nipple connecting the SPD/TVSS device enclosure to the panel enclosure shall be sealed with duct seal or other nonflammable medium to prevent soot from entering the enclosure in the event of a SPD/TVSS device failure. The surge arrestors may also be installed within the panel tubs by the panelboard manufacturer at the contractor's discretion.

VIII. Installation of Safety Switches

Safety switches shall be provided with appropriate mounting hardware and strut support. Strut support shall be hot-dipped, galvanized steel strut support, Unistrut P-1000 HG, or approved equal. Provide zinc rich paint applied to field cuts of strut support to minimize the potential for corrosion per the respective strut support manufacturer's recommendation. All hardware shall be corrosion-resistant. Mount safety switches securely in accordance with the manufacturer's recommendations/instructions and as required for the respective application. Inspect all safety switches for proper operation, tight and secure connections, and correctness. All safety switch enclosures shall be bonded to ground with a ground lug or bar and ground wire. Field cut holes in safety switch enclosures to accommodate conduit entrances. Where safety switch enclosures are provided with concentric knockouts, and the respective conduit does not use the largest knockout, install a grounding bushing with ground wire connections between the bushing and the ground bus. Where safety switches enclosures are used for service entrance applications provide a grounding bushing with ground wire connections between the bushing and the ground bus at each metal conduit entry. Do not use safety switch enclosures for a splice box or for a pull box. Do not route control wires or other circuit wiring through a safety switch enclosure. Where splices are required or other control circuit wires are installed in the respective conduit to a safety switch, provide a separate junction box to accommodate the splices and/or other circuit conductors. Provide weatherproof, abrasion-resistant, engraved legend plates for each safety switch noting the device served, the power source, and the voltage system.

IX. Grounding Requirements

Grounding shall conform to the following as applicable: The Contractor shall furnish and install all grounding shown on the Plans and/or as may be necessary or required to make a complete grounding

system as required by the latest National Electrical Code (NFPA 70) in force. The reliability of the grounding system is dependent on careful, proper installation and choice of materials. Improper preparation of surfaces to be joined to make an electrical path, loose joints, or corrosion can introduce impedance that will seriously impair the ability of the ground path to protect personnel and equipment and to absorb transients that can cause noise in communications circuits. The following functions are particularly important to ensure a reliable ground system:

A. All products associated with the grounding system shall be UL-listed and labeled.

B. All bolted or mechanical connections shall be coated with a corrosion preventative compound before joining, Sanchem "NO-OX-ID A Special" compound, Burndy Penetrox E, or approved equal.

C. Metallic surfaces to be joined shall be prepared by the removal of all non-conductive material, per National Electrical Code Article 250-12.

D. Metallic raceway fittings shall be made up tight to provide a permanent low impedance path for all circuits. Metal conduit terminations in enclosures shall be bonded to the enclosure with UL-listed fittings suitable for grounding. Provide grounding bushings with bonding jumpers (from bushing to the respective ground connection/enclosure frame) for all metal conduits entering service equipment (meter bases, CT cabinet, service disconnects, service panelboards, main service breaker enclosure, etc.). Provide grounding bushings with bonding jumpers for all metal conduits entering an enclosure through concentric or eccentric knockouts that are punched or otherwise formed so as to impair the electrical connection to ground. Standard locknuts or bushings shall not be the sole means for bonding where a conduit enters an enclosure through a concentric or eccentric knockout.

E. All connections, located above grade, between the different types of grounding conductors shall be made using UL-listed double compression crimp-type connectors or UL-listed bolted ground connectors. For ground connections to enclosures, cases and frames of electrical equipment not supplied with ground lugs the Contractor shall drill required holes for mounting a bolted ground connector. All bolted ground connectors shall be Burndy, Thomas and Betts, or equal. Tighten connections to comply with tightening torques in UL Standard 486A to assure permanent and effective grounding.

F. All metal equipment enclosures, conduits, cabinets, boxes, receptacles, motors, etc. shall be bonded to the respective grounding system.

G. Each feeder circuit and/or branch circuit shall include an equipment ground wire. The equipment ground wire shall not be smaller than allowed by NEC Table 250-122 "Minimum Size Conductors or Grounding Raceway and Equipment." When conductors are adjusted in size to compensate for voltage drop, equipment-grounding conductors shall be adjusted proportionately according to circular mil area. All equipment ground wires shall be copper either bare or insulated green in color. Where the equipment grounding conductors are insulated, they shall be identified by the color green and shall be the same insulation type as the phase conductors.

H. Provide all boxes for outlets, switches, circuit breakers, etc. with grounding screws. Provide all control panel, transfer switch, etc. enclosures with grounding bars with individual screws, lugs, clamps, etc. for each of the grounding conductors that enter the respective enclosures. Do not terminate more than one (1) ground wire in ground lug or

terminal unless the respective lug or terminal is rated for multiple conductors.

I. Equipment ground wires shall be identified with green colored insulation for all conductor AWG or Kcmil. Green tape shall not meet this requirement.

J. All exterior metal conduit, where not electrically continuous because of non-metallic junction boxes, etc., shall be bonded to all other metal conduit in the respective duct run, and at each end, with a copper bonding jumper sized in conformance with NEC 250-102. Where metal conduits terminate in an enclosure (such as a motor control center, switchboard, etc.) where there is not electrical continuity with the conduit and the respective enclosure, provide a bonding jumper from the respective enclosure ground bus to the conduit sized per NEC 250-102.

K. Install grounding electrode conductors and/or individual ground conductors in Schedule 40 or Schedule 80 PVC conduit. Where grounding electrode conductors or individual ground conductors are run in PVC conduit, Do Not completely encircle conduit with ferrous and/or magnetic materials. Use non-metallic reinforced fiberglass strut support. Where metal conduit clamps are installed, use nylon bolts, nuts, washers and spacers to interrupt a complete metallic path from encircling the conduit.

X. Electrical Testing

The installation shall be tested in operation and as a completed unit prior to acceptance. Contractor shall furnish all equipment, meters, instruments, cable connections, tools, manpower, and labor to perform the respective tests. Test all new equipment and all existing equipment where modifications take place and confirm proper operation. Coordinate tests with the respective airport personnel and the Resident Engineer/Resident Project Representative. Tests shall include resistance, voltage, and current reading, as applicable for the respective equipment. When tests disclose any unsatisfactory workmanship or equipment furnished under this contract, correct defects and retest. Repeat tests until satisfactory results are obtained. When any wiring or equipment is damaged by tests, the wiring or equipment shall be repaired or replaced at no additional cost to the contract. Test repaired or replaced items to ensure satisfactory operation. Submit three copies of all test reports to the Engineer. All test reports shall be assembled and bound in a folder or binder. Each test report shall include the following information:

- Project number,
- Project title and location,
- Device or system tested,
- Test performed,
- Date performed,
- Test equipment used,
- Respective Contractor's name, address, and telephone number,
- Testing firm's name, address, and telephone number if other than the Contractor,
- Names of individuals performing tests,
- Names of individuals observing tests,
- Statement verifying each test,
- Nameplate data from respective equipment tested,
- Test results, and
- Retest results after correction of defective components or systems (where applicable).

XI. Marking and Labeling

Legend plates shall be provided for all equipment. Legend plates shall be provided to identify the equipment controlled, the power source, and the function of each device. Each individual circuit breaker, control panel, safety switch, shall be furnished with a phenolic engraved legend plate that identifies the respective device, the power source, and the respective voltage, phase, and wire. Furnish additional phenolic engraved legend plates as detailed on the Plans and/or where required by code. Legend plates shall be weatherproof and abrasion resistant phenolic/plastic engraved material and fastened with contact type permanent adhesive, screws, or rivets. Installation shall not break, crack, or deform the legend plate. Lettering shall be 1/4 in. high or larger. Equipment that is powered from a utility power source shall have black lettering on a white background.

Furnish and install weatherproof warning label for control panels to warn persons of potential electric arc flash hazards, per the requirements of NEC 110.16 "Flash Protection." Labels shall also conform to ANSI Z535.4-2002 "American National Standard for Product Safety Signs and Labels." NEC 110.16 requires that switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized shall be field marked to warn qualified persons of potential arc flash hazards. The markings shall be located so as to be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment. The warning labels are to indicate to a qualified worker who intends to open the equipment for analysis of work that a serious hazard exists and that the worker should follow appropriate work practices and wear appropriate personal protective equipment (PPE) for the specified hazard. Labels shall be as detailed on the Plans or shall include at least the following information: Warning – Potential Arc-Flash Hazards existing while working on this energized equipment. Appropriate PPE Required."

MEASUREMENT OF MEASUREMENT

The quantity of LOCKHOUSE - ELECTRICAL WORK to be paid for under this item shall consist of all labor, equipment, materials, associated supports, hardware, tools, operational instructions, coordination, and testing required to complete the installation of the Electrical system at the Lock House and to place it into proper working order.

BASIS OF PAYMENT

This work will be paid for at the contract lump sum price for LOCKHOUSE - ELECTRICAL WORK, which price shall be payment in full for labor, equipment and material to complete the work as specified herein.

END OF SPECIAL PROVISION – LOCKHOUSE ELECTRICAL WORK

LOCKHOUSE MECHANICAL SYSTEM

GENERAL

I. This work shall include the removal of the existing restroom exhaust fan, baseboard heaters, thermostats, etc, as shown on mechanical demo plan. The existing building will be remodeled – new HVAC consisting of PTAC unit, electric heater for restroom and utility room, exhaust system (wall louver, exhaust fan, ductwork and air devices) for restroom/utility room

II. All mechanical work (demo and new work) shall be combined into one pay item.

MATERIAL REQUIREMENTS

I. IDENTIFICATION FOR HVAC EQUIPMENT

Provide equipment labels and duct labels for identification purposes. Provide Product Data towards shop drawing submittal for each product. Labels shall be Brass, Stainless steel or Aluminum construction with a minimum letter size of ¼". Labels may be fastened with screws or contact type adhesive. Use equipment ID # as indicated on drawings. Clean piping and equipment surfaces that could impair bond of identification devices. Locate labels where accessible and visible.

II. DUCT INSULATION

Provide duct insulation on portions of sheet metal duct as specified. Provide Product Data towards shop drawing submittal for each product. Duct insulation shall be mineral fiberglass blanket Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type I with factory applied FSK jacket. Provide 1.5" thick and minimum 0.75 PCF density insulation. Provide product from one of the following manufacturers – CertainTeed, Johns Manville, Knauf, Owens Corning. Use Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136, minimum 3" wide and 6.5 mils thick.

Install insulation with longitudinal seams at top and bottom of horizontal runs. Keep insulation materials dry during application and finishing. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses. Secure insulation with adhesive and insulation pins.

III. TESTING ADJUSTING AND BALANCING (TAB)

Balance exhaust air system as per cfm's indicated on drawings. TAB entity shall be certified by AABC, NEBB or TABB. Comply with requirements in ASHRAE 62.1, Section 7.2.2 - "Air Balancing." Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance", ASHRAE 111, NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems", or SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing".

IV. METAL DUCTS

Provide single wall rectangular ducts and fittings, sheet metal materials, sealants/gaskets and hangers/supports. Comply with SMACNA's "HVAC Duct Construction Standards- Metal and Flexible".

Galvanized sheet steel shall comply with ASTM A 653/A 653M with a galvanized coating designation of G90. Seal all duct joints. Use threaded rods and angle or channel supports. Keep ducts clean during construction.

V. EXHAUST FAN

Provide in-line cabinet centrifugal fan as per schedule on drawings. Product Data towards shop drawing submittal shall include certified fan performance criteria, motor ratings and accessories. Provide product from one of the following manufacturers – Greenheck, Cook, Carnes. Support from structure using threaded rods and elastomeric hangers.

VI. DIFFUSERS REGISTERS AND GRILLES

Provide air devices as per schedule on drawings. Product Data towards shop drawing submittal shall include performance criteria and accessories. Provide product from one of the following manufacturers – Titus, Price Industries, Carnes, Hart & Cooley. Install registers and grilles with airtight connections to ducts and to allow service and maintenance of dampers, etc. Maintain factory finish during/after installation.

VII. PACKAGE TERMINAL AIR-CONDITIONERS (PTAC)

Provide PTAC unit as per schedule on drawing. Product Data towards shop drawing submittal shall include certified performance criteria, ratings, accessories and installation manual. Unit shall be through-the-wall, heat pump and electric heat. Warranty (parts and labor) for sealed refrigeration system shall be 5 years from date of substantial completion. Provide products from one of the following manufacturers – Gree, Ice-Air, GE, Trane. Refrigerant shall be R-407C or R-410A. Include washable filter plus one additional spare filter. Unit performance rating shall comply with ARI 310/380/CSA C744. Adjust and set initial set points and occupancy schedule as per Department's requirements. Include training for Department's personnel to adjust, operate and maintain PTAC unit.

VIII. ELECTRIC HEATERS

Provide heavy duty fan-forced wall heater and heavy duty baseboard heater as per schedule on drawing. Product Data towards shop drawing submittal shall include performance criteria, ratings, accessories and O&M manual. Provide products from one of the following manufacturers – QMark, Markel, Berko, Chromalox, Indeeco.

METHOD OF MEASUREMENT

All items described in this special provision shall be included as part of the LOCKHOUSE - MECHANICAL WORK (HVAC) and measured for payment as a single lump sum item..

BASIS OF PAYMENT

Work described in this special provision and shown on mechanical drawing sheets shall not be paid separately but shall be included as a lump sum with the pay item listed as LOCKHOUSE - MECHANICAL WORK (HVAC).

END OF SPECIAL PROVISION – LOCKHOUSE MECHANICAL SYSTEM

LOCKHOUSE PLUMBING SYSTEM

GENERAL

I. This work shall include the removal of the existing toilet, lavatory, water heater, well tank and associated domestic water and sanitary waste/vent piping as illustrated on the plumbing demolition plan. The existing building will be remodeled – new plumbing consisting of toilet, lavatory, sink, water heater, well tank and associated domestic water and sanitary waste/vent piping.

II. All plumbing work (demo and new work) shall be combined into one pay item.

MATERIAL REQUIREMENTS

I. METERS AND GAGES FOR PLUMBING PIPING

A. Provide bimetallic-actuated thermometers with 5-inch nominal diameter stainless steel sealed case and plain glass window. Thermometer dial shall be non-reflective aluminum with permanently etched scale markings in deg. F with an accuracy of plus or minus 1 percent of scale range from 0 to 250 deg. Element shall be bimetal coil, connector type shall be an adjustable angle union joint with unified-inch screw threads and stem shall be stainless steel. Provide products from one of the following manufacturers – Miljoco Corporation, Trerice, H.O. Co., Weiss Instruments, Inc. or Palmer Wahl Instrumentation Group. Provide data on each product for shop drawing submittal review.

B. Liquid-in-glass thermometers may also be provided. Thermometer shall have an adjustable angle 7-inch cast aluminum case, clear glass window and blue or red organic filled magnifying lens glass tube. Aluminum tube background shall be non-reflective with permanently etched scale markings graduated in deg. F with an accuracy of plus or minus 1 percent of scale range from 0 to 250 deg. F and an aluminum stem for thermowell installation with a graphite and glycerin heat transfer medium. Provide products from one of the following manufacturers – Miljoco Corporation, Trerice, H.O. Co, Weiss Instruments, Inc. or Palmer Wahl Instrumentation Group. Provide data on each product for shop drawing submittal review.

C. Provide direct-mounted, metal-case, dial-type pressure gages. Pressure gage shall have a 4-1/2" nominal diameter cast aluminum or stainless steel sealed case with glass window and a Bourdon tube pressure element assembly. Movement shall be mechanical with link to pressure element and connection to pointer and pressure connection shall be bottom outlet brass type. Scale marking shall be non-reflective aluminum permanently etched and graduated in psi with an accuracy of plus or minus 1 percent of full scale range from 0 to 100 psi and have a dark colored metal pointer. Provide products from one of the following manufacturers - Miljoco Corporation, Trerice, H.O. Co., Weiss Instruments, Inc. or Palmer Wahl Instrumentation Group. Provide data on each product for shop drawing submittal review.

II. BALL VALVES FOR PLUMBING PIPING

A. Provide two or three-piece brass or bronze full port ball valves with brass or bronze trim and threaded or soldered ends. Ball valves shall be NSF 61 and MSS SP-110 compliant, have a CWP rating of 600 psig, PTFE seats, brass or bronze valve stem, chrome plated brass ball and quarter turn handlever actuator. Bronze valve construction shall contain less than 15 percent zinc. Provide products from one of the following manufacturers – Apollo Valves, Nibco Inc., Milwaukee Valve Company or American Valve, Inc. Provide data on each product for shop drawing submittal review.

III. CHECK VALVES FOR PLUMBING PIPING

A. Provide Class 125, bronze, swing check valves with bronze disc. Check valves shall be NSF 61 and MSS SP-80 Type 3 compliant, have a CWP rating of 200 psig, constructed of ASTM B 62 bronze and have threaded or soldered ends. Provide products from one of the following manufacturers – Nibco Inc., Milwaukee Valve Company, American Valve, Inc. or Watts Regulator Co. Provide data on each product for shop drawing submittal review.

IV. HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

A. Provide carbon steel clevis hangers, trapeze support assemblies and clamps to support domestic water, sanitary waste and vent piping and piping accessories. Hangers and supports shall be installed as required to properly support the piping from the building structure and in accordance with the piping manufacturer's recommendations. Install hangers and supports complete with the necessary attachments, inserts, bolts, threaded rods, nuts, washers and other accessories. Nonmetallic coatings on attachments shall be used for electrolytic protection where attachments are in direct contact with copper piping. Provide data on each product for shop drawing submittal review.

V. IDENTIFICATION FOR PLUMBING PIPING

A. Provide pipe labels for identification purposes. Labels shall be printed plastic with contact-type, permanent-adhesive backing. Include identification of piping service using same designations or abbreviations as used on drawings, pipe size, and an arrow indicating flow direction with letter size of at least 1-1/2 inches. Clean piping surfaces that could impair bond of identification labels. Locate labels where accessible and visible. Provide data on each product for shop drawing submittal review.

VI. PLUMBING PIPING INSULATION

A. Provide Type I, 850 deg. F mineral or glass fiber preformed pipe insulation utilizing a thermosetting resin for bonding of fibers. Pipe insulation shall have a factory applied all service jacket and 1 inch wall thickness. Provide products from one of the following manufacturers – Johns Manville, Knauf Insulation, Owens Corning or Manson Insulation Inc. All insulation materials and associated components that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871. Insulation materials and associated components shall also have a flame-spread index of 25 or less and smoke developed index of 50 or less. Provide data on each product for shop drawing submittal review.

B. Insulation materials shall be installed on domestic cold and hot water piping and kept dry during the application and finishing process. Seams and joints shall be bonded with adhesive recommended by insulation material manufacturer with additional securement by bands or outward-clinching insulation staples. Adhesives, vapor barrier mastic for cold water piping, breather mastic for hot water piping and sealants shall be applied at manufacturer's recommended coverage rate and wet and dry film thicknesses.

C. A white, high impact resistant 20 mils-thick PVC jacket shall be field installed on all exposed domestic water piping. Factory or field fabricated fitting covers matching jacket material shall also be installed. Provide products from one of the following manufacturers – Johns Manville, P.I.C. Plastics Inc., or Proto Corporation. White vapor-retarding tape matching field-applied PVC jacket with acrylic adhesive and a width of 2 inches shall be used. All jacketing and associated components shall also have a flame-spread index of 25 or less and smoke developed index of 50 or less. Provide data on each product for shop drawing submittal review.

D. PVC jacketing material seams and joints shall be bonded with manufacturer's recommended adhesive and applied at manufacturer's recommended coverage rate and wet and dry film thicknesses.

E. Provide manufactured protective plastic shielding guards for covering exposed lavatory domestic water and waste piping connections. Provide products from one of the following manufacturers – Truebro, Zurn Industries, McGuire Manufacturing or Insul-Tect Products Co. Provide data on each product for shop drawing submittal review.

VII. DOMESTIC WATER PIPING

A. Provide NSF-61 compliant ASTM B 88, Type L, drawn temper water tube and wrought-copper, solder-joint fittings. Joint connections shall utilize ASTM B 32 lead-free alloy solder filler metals and ASTM B 813 water flushable flux. Dielectric nipples and unions with solder or threaded end connections and a pressure rating of 125 psig at 180 deg. F shall be installed at connections of dissimilar metal piping and tubing. Provide dielectric unions and nipples from one of the following manufacturers – Wilkins, Watts, McDonald, A.Y. Mfg. Co. or Hart Industries International, Inc. Provide data on each product for shop drawing submittal review.

B. Piping shall be installed per 2004 Illinois Plumbing Code, level and plumb without sags or bends and with fittings used for changes in direction and branch connections. Piping shall be joined in accordance with ASTM B 828 or CDA's "Copper Tube Handbook". Piping shall be pressure tested to a static water pressure test of 50 psig above operating pressure, without exceeding pressure rating of piping system materials for a duration of four hours. Observed leaks shall be repaired and retested. After pressure tests have been performed, piping system shall be cleaned and disinfected using a 50 ppm water/chlorine solution for a duration of 24 hours or 200 ppm for a duration of three hours. After cleaning and disinfection has been performed, piping system shall be flushed with clean potable water until no chlorine is present.

VIII. DOMESTIC WATER PIPING SPECIALTIES

A. Provide an exposed, bronze, temperature-actuated, water mixing valve with a minimum flow of 0.5 gpm as per schedule on drawings. Provide products from one of the following manufacturers – Leonard Valve Company, Powers, Lawler Manufacturing Company or Armstrong International, Inc. Provide data on each product for shop drawing submittal review.

B. Provide an exposed, automatic draining, freezeless wall hydrant per schedule on drawings. Provide products from one of the following manufacturers – Woodford Manufacturing Company, Zurn Industries, Josam Company or Jay R. Smith Mfg. Co. Provide data on each product for shop drawing submittal review.

IX. FACILITY INDOOR POTABLE WATER STORAGE TANKS

A. Provide vertical, steel, pre-charged, diaphragm water storage tanks as per schedule on drawings. Provide products from one of the following manufacturers – Amtrol Inc., Wessels Company, Armstrong Pumps Inc. or State Industries Inc. Provide data on each product for shop drawing submittal review.

X. SANITARY WASTE AND VENT PIPING

A. Provide ASTM D 2665 and ASTM D 3311 solid-wall schedule 40 PVC pipe and socket fittings. Adhesive primer and solvent cement shall be utilized for pipe joint construction. Elastomeric or rubber sleeve non-pressure transition fittings with full length corrosion-resistant outter shield and corrosion-resistant-metal tension band constructed in accordance with ASTM C 1460 shall be used for joining piping with small differences in OD's or of different materials. Transition fittings shall be provided from one of the following manufacturers – Cascade Waterworks Mfg. Co. or Mission Rubber Company. Provide data on each product for shop drawing submittal review.

B. Piping shall be installed per 2004 Illinois Plumbing Code, without sags and bends and fittings shall be used for changes in direction and branch connections. Aboveground PVC piping shall be installed according to ASTM D 2665 and underground piping shall be installed according to ASTM D 2321 with joint construction in accordance with ASTM D 2855 and ASTM D 2665. Piping system shall be pressure tested prior to concealment by filling system with water to point of overflow, but not less than 10-foot head of water for a duration of fifteen minutes. Observed leaks shall be repaired and retested.

XI. SANITARY WASTE PIPING SPECIALTIES

A. Provide a cast iron floor drain with a 6 inch by 6 inch nickel bronze heel proof strainer as per schedule on drawings. Provide products from one of the following manufacturers – Zurn Industries, Josam Company, Jay R. Smith Mfg. Co. or Watts Drainage Products. Provide data on each product for shop drawing submittal review.

B. Provide a cast iron floor cleanout with a round scoriated nickel bronze top as per schedule on drawings. Provide products from one of the following manufacturers – Zurn Industries, Josam Company, Jay R. Smith Mfg. Co. or Watts Drainage Products. Provide data on each product for shop drawing submittal review.

C. Provide a cast iron yard cleanout and heavy duty cast iron cleanout housing as per schedule on drawings. Provide products from one of the following manufacturers – Zurn Industries, Josam Company, Jay R. Smith Mfg. Co. or Watts Drainage Products. Provide data on each product for shop drawing submittal review.

XII. ELECTRIC DOMESTIC WATER HEATERS

A. Provide a wall hung electric domestic hot water heater as per schedule on drawings. Provide products from one of the following manufacturers – Bradford White Corporation, State Industries or A.O. Smith Corporation. Provide data on each product for shop drawing submittal review.

XIII. COMMERCIAL WATER CLOSETS

A. Provide a two piece floor mounted, ADA compliant vitreous china water closet as per schedule on drawings. Provide products from one of the following manufacturers – Zurn Industries, Kohler Co., American Standard America or Crane Plumbing, LLC. Provide data on each product for shop drawing submittal review.

B. Provide an open front toilet seat without cover as per schedule on drawings. Provide products from one of the following manufacturers – Bemis Manufacturing Company, Church Seats, Zurn Industries, Kohler Co. or American Standard America. Provide data on each product for shop drawing submittal review.

XIV. COMMERCIAL LAVATORIES

A. Provide a white vitreous china, ADA compliant wall hung lavatory as per schedule on drawings. Provide products from one of the following manufacturers – Zurn Industries, Kohler Co., American Standard America or Crane Plumbing, LLC. Provide data on each product for shop drawing submittal review.

B. Provide a deck mounted, chrome plated, solid brass, 0.5 gpm, two-handle, lavatory faucet as per schedule on drawings. Provide products from one of the following manufacturers – Chicago Faucets, Kohler Co, Zurn Industries or Delta Faucet Company. Provide data on each product for shop drawing submittal review.

XV. COMMERCIAL SINKS

A. Provide a single bowl, 18 gauge, Type 304, stainless steel self-rimming sink as per schedule on drawings. Provide products from one of the following manufacturers – Elkay Manufacturing Co., Kohler Co. or American Standard America. Provide data on each product for shop drawing submittal review.

B. Provide a deck mounted, chrome plated, solid brass, 2.2 gpm, two-handle, gooseneck faucet as per schedule on drawings. Provide products from one of the following manufacturers – Chicago Faucets, Kohler Co, Zurn Industries or Delta Faucet Company. Provide data on each product for shop drawing submittal review.

METHOD OF MEASUREMENT

All items described in this special provision shall be included as part of the LOCKHOUSE – PLUMBING WORK and shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

Work described in this special provision and shown on plumbing drawing sheets shall not be paid separately but shall be included as a lump sum with the pay item listed as LOCKHOUSE – PLUMBING WORK.

END OF SPECIAL PROVISION – LOCKHOUSE PLUMBING SYSTEM

MECHANICAL IDENTIFICATION

GENERAL

I. Provision Includes identification of:

A. Exhaust Fans.

B. Dampers.

II. Quality Assurance

A. Regulatory Requirements:

1. Comply with BOCA Mechanical Code.
2. Product manufacturer: ISO 9001 Quality Certified.

III. References

A. American National Standards Institute (ANSI):

1. ASME A13.1 - Scheme for the Identification of Piping Systems.
2. Z535.1 - 1991 - Safety color Code for Marking Physical Hazards.
3. NFPA 99C – Standard on Gas and Vacuum System.

IV. Submittals

A. Submit list of wording, symbols, letter size and color-coding for mechanical identification.

B. Submit manufacturer's installation instructions.

MATERIAL REQUIREMENTS

I. Equipment Labels:

A. Furnish and install phenolic labels on the following equipment: Exhaust fans

B. Each label shall contain the following information:

1. Air handling units or air moving equipment:

a. CFM’s.
b. ESP.
c. Fan RPM.

2. Label shall be sized to hold noted information, black letters on white background. Letter size to be ¼” in height minimum.

CONSTRUCTION REQUIREMENTS

I. Preparation

A. Degrease and clean surfaces to receive adhesive for identification materials.

II. Installation

A. Ensure that identification markers are proper size and material to properly and clearly identify items as recommended by Marker Manufacturer and in accord with specified regulatory requirements.

III. Adjust & Clean

A. Upon completion of the work, examine entire installation. Correct all errors or defects.

1. Remove all surplus materials, packaging, rubbish and debris resulting from the work and legally dispose off site.
2. Leave the work area broom clean.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – MECHANICAL WORK (HVAC) as shown on the Mechanical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – MECHANICAL WORK (HVAC) shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION - MECHANICAL IDENTIFICATION

MILLWORK

DESCRIPTION

This work shall consist of furnishing and installing cabinets, countertops, and windowsills in the lockhouse as shown on the plans.

I. REFERENCES

A. 2010 ADA Standards For Accessible Design
B. Architectural Woodwork Institute: Architectural Woodwork Quality Standards
C. ANSI A161.1-1980.
D. ANSI A 208.1-1999 M-3. (Formaldehyde free material)
E. NEMA LD3-1995
F. Hardwood: ANSI A135.4, Class 1, tempered, smooth 2 sides.
G. AWI Quality Standards. Latest Edition.

II. QUALITY ASSURANCE

A. Contractor qualifications: Employ only experienced Contractors (Installers) skilled in the successful installation of the specified materials and assemblies on similar projects for a minimum of ten (10) years. Installers shall be state-certified or Florida licensed Contractors.

B. Manufacturer Qualifications: Employ millwork manufacturers with at least ten (10) years experience making the specified materials as a current catalog and regular production item.

C. Preparation and Field Verification:

1. Verify that Shop Drawings have been successfully submitted, reviewed and approved by the Engineer before fabrication of cabinetry.
2. Verify Shop Drawing dimensions with existing field conditions.
3. Verify all Mechanical and Electrical rough-ins.

D. Source Limitations: Provide products of the same manufacturer for each type of unit.

III. WARRANTY

A. Casework Manufacturer shall warrant all casework products against manufacturing defects in material and fabrication for a period of five (5) years.

B. Manufacturer shall warrant against structural failure of the cabinet body for a period of ten (10) years.

C. Installers Warranty: The installer shall warrant the entire installation against defects in material and workmanship for a period of three (3) years.

D. Unless otherwise stated in this Guideline, duration of all warranties shall begin on the date of Substantial Completion.

IV. SAMPLE MATERIALS

A. The contractor shall submit a sample of the Modular Casework with his shop submittal. The Engineer and the Department shall approve the sample. If the Manufacturer changes or modifies the materials or its construction, a revised sample of the Modular Casework shall be submitted for review and approval. Failure to have the sample approved disqualifies the bidder.

1. Sample does not have to be full scale but large enough to display all the materials listed in this standard to include: fronts, tops, backs, sides laminate, shelf, pulls, slides, backing, rails, hinges, base, doors and drawers.

MATERIAL

I. FABRICATION

A. Modular Casework shall be fabricated at one factory/plant and shipped from one factory/plant directly to project location.

B. All Modular Casework shall be manufactured in a climate-controlled environment, stored after fabrication in a climate controlled (temperature and humidity) storage area and shipped to the job site in an enclosed container (semi-tractor trailer).

II. MATERIALS

A. Core Material: Core Material to be Plywood per ANSI A208.1, Grade M-2, in thickness specified".

B. Adhesive: Water based low Volatile Organic Compound (VOC) Non-toxic, PVA adhesive.

C. Plywood: Formaldehyde –free Hardwood Plywood

D. Laminates:

1. High Pressure Plastic Laminate: NEMA LD 3 – 2000 VGL and CLS.

III. HARDWARE

A. Hinges: Five knuckle, powder coated

B. Door Catch: Magnetic

C. Pulls: Door and drawer front pulls shall be epoxy powder coated in compliance with ADA.

D. Drawer Slides: Manufacturers standard epoxy coated metal, nylon rollers, and 100 pounds dynamic load. Provide outstop and outkeeper to maintain drawer in 80% open position.

E. Locks: Cylinder type with 5-disc tumbler mechanism. Locks shall be provided where shown on the drawings. Each area or room shall be keyed alike.

F. Shelf supports: Molded nylon or nickel, 2-pin, recessed, 200 pound minimum capacity support clip.

IV. DESIGN REQUIREMENTS

A. Base Cabinet: Construction/racking test……800 lbs.

B. Cabinet Front: Joint loading test……..425 lbs.

C. Wall Cabinet: Static Load Test…… ……2,000 lbs.

D. Drawer Front: Joint loading test…… 600 lbs.

E. Drawer Construction: Static load test…….750 lbs.

F. Cabinet adjustable shelf support device/static load test……..300 lbs.

V. PLASTIC LAMINATE

A. High Pressure Plastic Laminate: NEMA LD 3 – 2000 VGL & CLS.

B. Vertical Surfaces: GP-28 high pressure complying with ANSI/NEMA LD 3.

C. Countertops: GP-50 high-pressure complying with ANSI/NEMA LD 3.

C. Balanced construction of all laminated panels is mandatory.

D. Thermofused Melamine: NEMA LD 3 – 2000 VGS.028 (lifetime warranty).

VI. CASEWORK CONSTRUCTION

A. Base: 4- inch high, ¾ inch CDX plywood.

B. Tops and bottoms: ¾" glued and doweled to cabinet sides.

1. Tops, bottoms and sides are plywood core.
2. High Pressure Plastic Laminate.
3. Provide marine grade plywood in lieu of at all sink locations.

C. Cabinet backs: Shall be fully bound (dadoed) into sides, top and bottom, recessed 7/8" from the cabinet rear. Rear, unexposed side of back shall be toe-nailed to cabinet body with mechanical fasteners and solidified with a continuous bead of industrial grade hot melt adhesive. All cabinet backs shall have a minimum of two - ¾ inch x 4 " laminate clad flush mounting blocks (hang rails).

1. Hang rails shall be located at rear of cabinet back and fastened to cabinet sides. Provide 2 hang rails at wall cabinet, 1 hang rail at base cabinet and three hang rails at tall cabinets.

D. Doors/Drawer Fronts: Overlay, ¾" thick plywood core.

1. Front: High Pressure Laminate with balanced liner.
2. Edges: 3 mil PVC.

E. Shelving: 3/4 " thick plywood core.

1. Front Edge: 3 mil PVC
2. Top and Bottom: Melamine.

F. Drawer

1. Bottom: 1/2", fully bound (dadoed) into front, sides and back laminated with thermally fused melamine.

a. Body to include sides, back and sub-front 1/2" laminated with thermally fused melamine.

G. Construction Tolerances:

1. Gap between doors, drawers, panels and frames shall be 1/8".

CONSTRUCTION REQUIREMENTS

I. INSTALLATION

A. Do not start installation until the building is enclosed and the HVAC system controls the temperature and humidity (75 degrees, 55 RH) in the room space.

B. Erect the modular casework plumb, level, true and straight with no distortions. Countertops shall be installed to with-in 1/8-inch of level in a 10-foot length.

C. Adjust hardware so that the doors and drawers operate smoothly with no warp or bind.

H. All cabinet faces shall be plumb and true from door face to door face. There shall be no side hanging or non-plumb doors. Seams shall be flush.

I. Use filler sections to fit "equal dimensions" on walls.

II. SPECIAL INSTALLATION PROCEDURE / ADJUSTMENT PROCEDURES

A. Provide all items and accessories as required for a total and complete installation in every respect.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Installation of any items indicates all conditions are satisfactory and acceptance of previous Work by other Contractors**.**

C. Adjust casework and hardware so that doors and drawers operate smoothly**.**

III. CLEANING

A. All modular cabinet surfaces shall be cleaned of construction spoils, dirt, spills, dust and stains. The modular casework manufacturer shall recommend cleaning solvent. Clean all surfaces, edges and cabinet interiors.

B. Remove and dispose of all packing materials and related construction debris.

BASIS OF PAYMENT

Millwork will be paid for at the contract lump sum price for LOCKHOUSE - MILLWORK.

END OF SPECIAL PROVISION - LOCKHOUSE - MILLWORK

MODIFIED BITUMINOUS MEMBRANE ROOFING

GENERAL

This section includes Styrene-butadiene-styrene (SBS) modified bituminous membrane roofing, Roof surfacing consisting of granular surfacing, and roof insulation.

I. DEFINITIONS

A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

B. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mop-applied roofing asphalt and 75 centipoise for mechanical spreader-applied roofing asphalt, within a range of plus or minus 25°F, measured at the mop cart or mechanical spreader immediately before application.

II. PERFORMANCE REQUIREMENTS

A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

C. FM Approvals Listing: Provide membrane roofing, base flashings, and component materials that comply with requirements in FM Approvals 4450 and FM Approvals 4470 as part of a membrane roofing system, and that are listed in FM Approvals' "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals markings.

D. Fire/Windstorm Classification: Class 1A-75.

E. Hail Resistance Rating: SH.

F. FMG 1-49 Loss Prevention Data Sheet for Perimeter Flashings.

G. FMG 1-29 Loss Prevention Data Sheet for Above Deck Roof Components.

H. NRCA Roofing and Waterproofing Manual (Fifth Edition) for construction details.

III. SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work:

1. Base flashings and membrane terminations.
2. Tapered insulation, including slopes.
3. Crickets, saddles, and tapered edge strips, including slopes.
4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

C. Samples for Verification: For the following products:

1. Sheet roofing materials, including base sheet base-ply sheet roofing membrane sheet and flashing sheet, of color specified.
2. Roof insulation.
3. Six insulation fasteners of each type, length, and finish.

D. Qualification Data: For qualified Installer.

E. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article:

1. Submit evidence of complying with performance requirements.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.

G. Maintenance Data: For roofing system to include in maintenance manuals.

H. Warranties: Sample of special warranties.

IV. QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for membrane roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

C. Source Limitations: Obtain components including roof insulation fasteners for membrane roofing system from same manufacturer as membrane roofing.

D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

V. DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture,

approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight:

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

VI. PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

VII. WARRANTY

A. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period:

1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, and other components of membrane roofing system.
2. Warranty Period: Fifteen (15) years from date of Substantial Completion.

B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, and walkway products, for the following warranty period:

1. Warranty Period: Five (5) years from date of Substantial Completion.

MATERIAL REQUIREMENTS

I. SBS-MODIFIED ASPHALT-SHEET MATERIALS

A. SBS-Modified Bituminous Membrane Roofing:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CertainTeed Corp.
b. Firestone Building Products.
c. Garland Company, Inc. (The).
d. Johns Manville.
e. Tremco Incorporated.

B. Granule-Surface Roofing Membrane Cap Sheet: ASTM D 6162, Grade G, Type I or II, SBS-modified asphalt sheet (reinforced with a combination of polyester fabric and glass fibers); granular surfaced; suitable for application method specified, and as follows:

1. Granule Color: White.

II. BASE-SHEET MATERIALS

A. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq ft.

B. Base Sheet: ASTM D 4601, Type II, SBS-modified, asphalt-impregnated and -coated sheet, with glass-fiber-reinforcing mat, dusted with fine mineral surfacing on both sides:

1. Weight: 31 lb/100 sq ft, minimum.

III. BASE FLASHING SHEET MATERIALS

A. Flashing Sheet: ASTM D 5019, Type 1, Grade II, CSPE sheet:

1. Color: White.

IV. AUXILIARY ROOFING MEMBRANE MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane:

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Asphalt Primer: ASTM D 41.

C. Roofing Asphalt: ASTM D 312, Type III or IV as recommended by roofing system manufacturer for application.

D. Cold-Applied Adhesive: Roofing system manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with roofing membrane and base flashings.

E. Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, nonskinning, and nondrying.

F. Miscellaneous Accessories: Provide these recommended by roofing system manufacturer.

V. VAPOR RETARDER

A. Polyethylene Film: ASTM D 4397, 6 mils thick, minimum, with maximum permeance rating of 0.13 perm:

1. Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
2. Adhesive: Manufacturer's standard lap adhesive, FM Approvals approved for vapor-retarder application.

B. Laminated Sheet: Kraft paper, two (2) layers, laminated with asphalt and edge reinforced with woven fiberglass yarn, with maximum permeance rating of 0.50 permand with manufacturer's standard adhesive.

C. Self-Adhering Sheet Vapor Retarder: ASTM D 1970, minimum of 40-mil- thick, polyethylene film laminated to layer of rubberized asphalt adhesive; maximum permeance rating of 0.1 perm; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor-retarder manufacturer.

D. Self-Adhering Sheet Vapor Retarder: 30 to 40-mil thick, polyethylene film laminated to layer of butyl rubber adhesive; maximum permeance rating of 0.1 perm; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor-retarder manufacturer.

E. Glass-Fiber Felt: ASTM D 2178, Type IV, asphalt impregnated.

VI. ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.

C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 in. per 12 in. unless otherwise indicated.

D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

VII. INSULATION ACCESSORIES

A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.

B. Modified Asphaltic Insulation Adhesive: Insulation manufacturer's recommended modified asphaltic, asbestos-free, cold-applied adhesive formulated to attach roof insulation to substrate or to another insulation layer.

C. Cover Board: ASTM C 208, Type II, Grade 2, cellulosic-fiber insulation board, 1/2 in. thick.

D. Substrate Joint Tape: 6 or 8 in. wide, coated, glass-fiber joint tape.

CONSTRUCTION REQUIREMENTS

I. EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
2. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
3. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

II. PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

III. INSULATION INSTALLATION

A. Comply with roofing system manufacturer's written instructions for installing roof insulation.

B. Install tapered insulation under area of roofing to conform to slopes indicated.

C. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 in. with insulation:

1. Cut and fit insulation within 1/4 in. of nailers, projections, and penetrations.

D. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

E. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:

1. Set each layer of insulation in a solid mopping of hot roofing asphalt applied within plus or minus 25°F of equiviscous temperature.

F. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints a minimum of 6 in. in each direction from joints of insulation below. Loosely butt cover boards together and fasten to roof deck. Tape joints if required by roofing system manufacturer:

1. Apply hot roofing asphalt to underside, and immediately bond cover board to substrate.

IV. ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing" and as follows:

1. Deck Type: C (concrete or nonnailable).
2. Adhering Method: M (mopped).
3. Number of Glass-Fiber Base-Ply Sheets: Two (2).
4. Number of SBS-Modified Asphalt Sheets: One (1).
5. Surfacing Type: M (mineral-granule-surfaced cap sheet).

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Cooperate with testing agencies engaged or required to perform services for installing roofing system.

D. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast:

1. At end of each day's work, provide tie-offs to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Asphalt Heating: Heat and apply SEBS-modified roofing asphalt according to roofing system manufacturer's written instructions.

F. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

V. BASE-SHEET INSTALLATION

A. Loosely lay one course of sheathing paper, lapping edges and ends a minimum of 2 in.and 6 in., respectively.

B. Install lapped base-sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:

1. Adhere to substrate in a solid mopping of hot roofing asphalt.

VI. SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing membrane and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:

1. Adhere to substrate in a solid mopping of hot roofing asphalt applied at not less than 425°F.
2. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids:

1. Repair tears and voids in laps and lapped seams not completely sealed.

C. Install roofing membrane sheets so side and end laps shed water.

VII. FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof; secure to substrates according to roofing system manufacturer's written instructions, and as follows:

1. Prime substrates with asphalt primer if required by roofing system manufacturer.
2. Backer Sheet Application: Adhere backer sheet to substrate in a solid mopping of hot roofing asphalt.
3. Flashing Sheet Application: Adhere flashing sheet to substrate in a solid mopping of hot roofing asphalt applied at not less than 425°F. Apply hot roofing asphalt to back of flashing sheet if recommended by roofing system manufacturer.

B. Extend base flashing up walls or parapets to wood nailers at coping and 4 in. onto field of roofing membrane.

C. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions.

VIII. PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Engineer and Department.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

LOCKHOUSE – ROOF shall be measured for payment as a single lump sum item.

GATE STRUCTURE – ROOF – shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

LOCKHOUSE – ROOF shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to complete the roof as shown on the plans.

GATE STUCTURE – ROOF shall be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to complete the roof as shown on the plans.

WARRANTY SAMPLE

IX. ROOFING INSTALLER'S WARRANTY

A. WHEREAS <**Insert name**> of <**Insert address**>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Department: <**Insert name of Department**>.
2. Address: <**Insert address**>.
3. Building Name/Type: <**Insert information**>.
4. Address: <**Insert address**>.
5. Area of Work: <**Insert information**>.
6. Acceptance Date: <**Insert date**>.
7. Warranty Period: <**Insert time**>.
8. Expiration Date: <**Insert date**>.

B. AND WHEREAS Roofing Installer has contracted (either directly with Department or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be

made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

    a. Lightning.
    b. Peak gust wind speed exceeding <**Insert wind speed**> mph.
    c. Fire.
    d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition.
    e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work.
    f. Vapor condensation on bottom of roofing.
    g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Department.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Department or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Department allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Department engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Department in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Department shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Department from other remedies and resources lawfully available to Department in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Department or a subcontract with Department's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this <**Insert day**> day of <**Insert month**>, <**Insert year**>:

1. Authorized Signature: <**Insert signature**>.
2. Name: <**Insert name**>.
3. Title: <**Insert title**>.

END OF SPECIAL PROVISION – MODIFIED BITUMINOUS MEMBRANE ROOFING

NETWORK COMPONENTS

GENERAL

I. Summary

A. Section Includes:

1. Fiber Optic Cables.
2. Fiber Optic Cable Accessories.
3. Unshielded Twisted Pair Networking Cables.
4. Unshielded Twisted Pair Networking Cable Accessories.
5. Ethernet Switches.

II. Quality Assurance

A. Referenced Standards:

1. Institute of Electrical and Electronics Engineers, Inc. (IEEE):

a. 802.3, Information Technology - Local and Metropolitan Area Networks - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications.
b. 802.3u: IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T.
c. 802.3x: IEEE Standards for Local and Metropolitan Area Networks: Specification for 802.3 Full Duplex Operation.

III. Submittals

A. Product technical data including:

1. Acknowledgement that products submitted meet requirements of standards referenced.

B. Operation and Maintenance Manuals:

MATERIAL REQUIREMENTS

I. Fiber Optic Cables And Accessories

A. Fiber Optic Cable:

1. Acceptable Product:

a. Corning | LANscape 012EWF-T4101D20

2. Loose-tube, gel free type, suitable for outdoor, indoor, or riser use.
3. Twelve (12) fiber strands in single buffer tube.
4. Single mode fibers.
5. 1310/1383/1550nm wavelength operation.
6. Temperature Limitations:

    a. Storage: -40° C to +70° C (-40° F to +158° F)
    b. Installation: -10° C to +60° C (+14° F to +140° F)
    c. Operation: -40° C to +70° C (-40° F to +158° F)

B. Buffer Tube Fan-Out Kit:

1. Acceptable Product:

    a. Corning | LANscape FAN-OD25-06

2. Compatible with loose-tube, gel free cable.
3. Individual fiber strands color coded.
4. 25" length.
5. 6 individual fiber strands per buffer tube type.

C. Fiber Optic Connectors:

1. Acceptable Manufacturer:

    a. Corning | LANscape

2. SC compatible single mode connector.
3. Maximum insertion loss of 0.5dB, typical insertion loss of 0.2dB.
4. Operating temperature: -40° C to +70° C (-40° F to +158° F).
5. Field installable with hand tools only.

D. Fiber Termination Cabinet:

1. Acceptable Manufacturer: Ortronics | Legrand:

    a. Cabinet: OR-615SMFC-24P
    b. 6 Port Adapter Panel: OR-OFP-STS06NB
    c. 12 Port Adapter Panel: OR-OFP-STD12AC
    d. Fiber Patch Cord: OR-61150D08001M33C

2. Capable of holding minimum two (2) 12 position adapter panels, for a total panel capacity of 24 fibers.
3. Adapter panels shall snap-in for easy installation, removal, and expansion.
4. Adapter panels shall be provided with SC type fiber terminations.
5. Cabinet shall have open access with single door and latch.
6. Provided with both top and bottom cable entries for ease of cable installation.
7. Shall have complete internal cable management with designation labels for proper cable administration.

8. Shall allow easy access for installer to terminate cables prior to installation to cabinet frame.
9. Shall be constructed from heavy gauge steel with durable powder coat finish with no sharp or irregular edges.

II. Unshielded Twisted Pair Cables And Accessories

A. Cat. 6 rated.

III. Ethernet Switches

A. Acceptable Manufacturers:

1. Hirschmann.
2. Siemens.
3. N-TRON.
4. Weed.
5. GarrettCom.
6. Allen-Bradley/Cisco.

B. Managed Ethernet Switches:

1. Design and fabrication:

a. Support Ethernet 100 MBit/s.
b. Support SNMP and Web based management.
c. Rapid Spanning Tree Protocol.
d. IGMP (Internet Group Management Protocol) support for IP multicast filtering to enable switches to automatically route messages only to appropriate ports.
e. Backbone ports for connection to multimode fiber via type SC connectors.

1) Quantity as required for communication with devices as depicted in the Contract Documents.

f. 10/100 MBit/s twisted pair ports (RJ45) as required for communication with devices as depicted in the Contract Documents.

1) Unless otherwise noted, provide at least two (2) spare 10/100 MBit/s port (twisted pair) at each Ethernet switch.

g. Check all received data for validity.

1) Discard invalid and defective frames or fragments.

h. Monitor connected TP/TX line segments for short-circuit or interrupt using regular link test pulses in accordance with IEEE 802.3.

i. Monitor attached fiber optic lines for open circuit conditions in accordance with IEEE 802.3.
j. As applicable, meet requirements of IEEE 802.3.
k. Power switch with 120 Vac power input.
l. Provide LED status lights to indicate:

1) Power: Supply voltage present.
2) Fault.
3) Port status.

m. Environmental rating:

1) Operating temperature: 32 Deg F to 122 Deg F.
2) Humidity: 95 percent relative humidity, non-condensing.

2. Function in self-healing ring structure.

a. If one section in the ring fails, the ring structure changes to a line structure within 0.5 seconds.

CONSTRUCTION REQUIREMENTS

I. Installation And Checkout

A. Provide installation and checkout.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION – NETWORK COMPONENTS

NON-LOAD BEARING STEEL FRAMING

GENERAL

I. Section Includes:

A. Non-load-bearing steel framing systems for interior gypsum board assemblies.

MATERIAL REQUIREMENTS

I. PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: Provide materials and construction identical to those tested according to ASTM E 119.

II. FRAMING SYSTEMS

A. Steel Studs and Runners: ASTM C 645. Use either steel studs and runners.

1. Minimum Base-Metal Thickness: As indicated on Drawings.
2. Depth: As indicated on Drawings.

B. Slip-Type Head Joints: Where indicated, provide one of the following in thickness not less than indicated for studs and in width to accommodate depth of studs:

1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch-deep flanges, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.

C. Cold-Rolled Channel Bridging: Steel, 0.053-inch minimum base-metal thickness, with minimum 1/2-inch-wide flanges.

1. Depth: 1-1/2 inches
2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch-thick, galvanized steel.

III. AUXILIARY MATERIALS

A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Provide asphalt saturated organic felt or foam gasket.

CONSTRUCTION REQUIREMENTS

I. INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

II. INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

    a. Install two studs minimum at each jamb unless otherwise indicated.
    b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
    c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

E. Direct Furring:

1. Screw to wood framing.
2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

BASIS OF PAYMENT

All labor, equipment, materials, supports, hardware, and tools to complete the furred gypsum wall board assemblies and gypsum wall board partitions at each location where indicated in the construction documents will be paid for at the lump sum price for LOCKHOUSE - GYPSUM BOARD ASSEMBLIES.

END OF SPECIAL PROVISION – NON-LOAD BEARING METAL FRAMING

NORTH BERM EMBANKMENT TREE AND VEGETATION REMOVAL

DESCRIPTION

I. This work shall consist of removing trees and woody vegetation from the north berm embankment. The work shall also consist of the removing and chipping the vegetation and stockpiling it at a designated location. The work shall be coordinated with the Special Provision "Hand Compacted Earth Fill."

MATERIAL

I. Not Applicable

CONSTRUCTION REQUIREMENTS

I. General

A. The area west of the north berm embankment is a wetland. The contractor shall at no time stage equipment or in any way disturb the wetland. All work shall take place on the embankment. Work shall not extend any further west than elevation 738.5 on the west side of the embankment.

B. All erosion control equipment shall be installed prior to the removal of any trees or vegetation.

C. Tree trimming adjacent to the wetland shall be controlled with no large limbs or debris impacting the wetland.

D. All vegetation removed in accordance with Section 201 of the standard specifications.

II. Tree Removal

A. Trees shall be cut down and removed from the berm.

B. The stump and root ball and any roots greater than 1 inch in diameter shall be removed completely.

C. The contractor shall ensure the resulting void is free of organic debris.

D. The resulting void shall be backfilled immediately in accordance with the Special Provision "Hand Compacted Earth Fill."

III. Vegetation Removal

A. All vegetation that is not grass shall be removed from the berm in the areas indicated on the plans. All saplings and shrubs shall be removed in accordance with Section 201.08 of the Standard Specifications.

IV. Tree Trimming

A. Trees located in the wetland west of the berm that overhang the berm shall be trimmed. All tree limbs and branches that overhang the berm from a vertical line extended at the 738.5 ft elevation shall be cut and removed.

B. The contractor shall control the fall of the limbs to prevent them from damaging the wetland.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

NORTH BERM EMBANKMENT TREE AND VEGETATION REMOVAL shall be measured for payment per acre.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

NORTH BERM EMBANKMENT TREE AND VEGETATION REMOVAL will be paid for at the contract price per acre, including but not limited to, all labor materials, and equipment required to trim, remove and properly dispose of all trees and vegetation as indicated on the plans .

END OF SPECIAL PROVISION – NORTH BERM EMBANKMENT TREE AND VEGETATION REMOVAL

OVERCURRENT PROTECTION

GENERAL

I. Provision Includes:

A. Fuses.

B. Circuit Breakers.

II. References.

A. Institute of Electrical and Electronic Engineers (IEEE).

B. National Electrical Manufacturers Association (NEMA).

C. National Fire Protection Association (NFPA):

1. NFPA 70 - National Electrical Code (NEC).

D. Underwriters Laboratories, Inc. (UL):

1. All products UL Listed and labeled.

E. State of Illinois:

1. Illinois Steel Products Procurement Act, as amended.

III. Submittals

A. Product Data: Submit manufacturer's published product data showing material proposed, including time-current curves, current limiting effect charts, selective coordination tables and dimensional data.

B. Submit 3 copies of receipt signed by owner stating that spare fuses have been turned over, listing fuse type, size and quantity.

IV. Product Delivery, Storage And Handling

A. Fuses shall not be shipped in switchgear, disconnects, starters or panelboards except for control circuit fuses.

B. Stored in a safe, moisture-free area until needed for circuit energization.

MATERIAL REQUIREMENTS

I. Fuses

A. System coordination and current limitation for protection of each component of the electrical system have been designed in accord with the type, class and characteristic specified.

B. No substitutions will be considered.

C. Use fuses made by a single manufacturer throughout.

D. All fuses: 200,000 A interrupting capacity at rated AC or DC voltage.

E. Fuses 1/10 through 600 A:

1. Maximum operating temperature: 300^{o}F.
2. Self protecting thermally.
3. Separate overload and short circuit element.
4. Incorporate a spring-activated "snap-trigger" thermal overload element responsive to fuse temperatures exceeding 284 degrees F.
5. UL Class RK-1 with Time Delay.

F. Fuses 601 to 6,000 A:

1. UL Class L.
2. Pure silver links.
3. "O" ring seal.
4. 600 V or less AC.
5. 250 V or less DC.

G. Class L fuses shall be bolt-on type.

H. Class S fuses shall not be interchangeable with other sizes.

I. Acceptable Manufacturers:

1. Bussman
2. Littlefuse

II. Circuit Breakers

A. Quick-make, quick-break, overcenter, trip-free, toggle-type operating mechanism with positive handle indication that assumes a center position when tripped.

B. Permanent trip unit containing individual thermal and magnetic trip elements with inverse time tripping characteristics. Calibrated for operation in an ambient temperature of 40 degrees C.

C. Suitable for mounting and operating in any position.

D. UL Listed for installed panelboard and meet NEMA standard AB-1.

E. Terminations UL Listed for type and size wire specified.

F. Minimum UL Listed interrupting ratings as noted on panelboard schedules.

G. "HACR" rated for all heating, air conditioning, ventilation and refrigeration.

H. Branch circuit breakers feeding receptacles shall have sensitive instantaneous trip settings for not more than 10 times the overload trip rating of the breaker.

I. Branch breakers controlling light fixtures shall be switching duty rated.

CONSTRUCTION REQUIREMENTS

I. Fuses

A. Do not install fuses until equipment is ready to be energized.

B. Provide fuse type as recommended by manufacturer of equipment. Where manufacturer does not recommend a fuse type, provide the following types:

1. Fuses rated 1/10 to 600A for disconnect switches, motor starters, panels, and building switchboards shall be UL Class RK1TD.
2. Fuses rated 601 to 6000A for disconnect switches, motor starters, panels, and building low voltage switchboards shall be UL Class L.
3. Class T Fuses may be used for protection of lighting loads, heating loads, and for circuit breaker protection.

C. Provide fuse sizes as recommended by manufacturer. When manufacturer does not recommend a fuse size and the fuse size is not shown on drawings, conform to the following:

1. For 1.15 Service Factor motor loads provide fuses not exceeding 125% of motor full load current.
2. For 1.00 Service Factor motors loads provide fuses not exceeding 115% of motor full load current.
3. For motors requiring fuses larger than 600A, provide fuses not exceeding 150% of motor full load current.
4. When abnormal motor starting conditions require larger fuse sizes than recommended notify the Architect/Engineer immediately for resolution.
5. For all other loads, size fuses for the rated full load current as listed on the equipment.

D. Identification: In addition to labeling requirements specified elsewhere, provide the following:

1. Provide a label on the inside cover of each switch, motor starter, or other fused equipment.
2. Label shall indicate the fuse type, ampere rating and interrupting rating.
3. Manufacturer's labels are acceptable.

E. Where indicated on drawings, provide in-line fuse holders and fuses on the line side of lighting fixtures.

1. Fuse and holder shall be mounted in a location convenient for changing fuses.
2. Outdoor application holders shall be mounted in a protected location or be an inline waterproof-type fuse holder.
3. Size and type of fuse to be recommended by ballast manufacturer or as indicated on plans.

II. Circuit Breakers

A. Install according to manufacturer's instructions.

B. Wiring to breakers shall have rounded corners and be tied off with cable ties.

C. Tighten all lugs, bolts, clamps and screws to manufacturer's specifications.

III. Spare Parts

A. Provide one (1) standard carton of ten (10) fuses for all sizes used between 0 to 60A.

B. Provide 10% or a minimum of three of each type and rating of all fuses greater than 60A.

C. Store spare fuses in spare fuse cabinet and provide typewritten inventory of fuses provided.

D. At completion of project turn over spare fuses to the Department. Obtain signed receipt and submit three copies with final pay package.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. GATE STRUCTURE – ELECTRICAL WORK as shown on the Electrical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

3. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

4. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. GATE STRUCTURE – ELECTRICAL WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

3. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

4. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION OVERCURRENT PROTECTION

PANELBOARDS

GENERAL

I. Provision Includes:

A. Distribution Panelboards, including enclosure, trim, & cover complete.

B. Branch Circuit Panelboards including enclosure, trim, & cover complete.

II. References.

A. American National Standards Institute (ANSI).

B. National Electrical Manufacturers Association (NEMA):

1. AB-1 – Molded Case Circuit Breakers.
2. 250 – Enclosures

C. National Fire Protection Association (NFPA):

1. NFPA 70 – National Electric Code

D. Underwriter's Laboratories (UL):

1. UL 67
2. UL 50

E. State of Illinois:

1. Illinois Steel Products Procurement Act, as amended.

III. Submittals

A. Shop Drawings:

1. Submit detailed drawing of all panelboards indicating schedules and ratings of circuit breakers, bus, lugs, enclosures and associated accessories.
2. One-line diagrams shall be submitted for all panelboards.
3. Indicate all dimensions and verify that equipment will fit into locations shown.
4. Finish and mounting (flush, surface, outdoor) shall be clearly indicated.

5. Drawings showing concealed hinges and trim clamp construction

B. Product Data:

1. Submit manufacturer's product data for each panelboard. Product data should include:

a. UL Labeling for application required.

b. Electrical ratings including bus continuous Amps, short-circuit Amps, Voltage, Phase, and neutral and ground bus ratings
c. Breaker types to be used
d. All other accessories.

IV. Delivery, Storage And Handling

A. Materials shall be suitably packaged by manufacturer to prevent damage during shipment. Damaged materials will not be acceptable for use.

B. Store materials on site in clean, dry storage area; when outside, elevated above grade and enclosed with durable watertight wrapping.

C. Handle all materials carefully to prevent damage. Minor scratches, marks or blemishes to finish shall be repaired to satisfaction of Engineer.

MATERIAL REQUIREMENTS

I. Acceptable Manufacturers

A. Cutler Hammer

B. General Electric

C. Square D

D. Seimens

II. Distribution Panelboards

A. General:

1. UL Listed.
2. Dead front construction and enclosed in a steel cabinet as specified in UL 50 and NEC.
3. When utilized for service entrance shall be UL Labeled.

B. Enclosure:

1. Gutters shall be sized in accordance with UL 67 and NEC.
2. Have a typewritten directory, under transparent plastic on inside of cover door to identify each circuit load and location.
3. Trims shall be of the type with concealed hinges and trim clamps with no exposed screws or bolts, and have keyed locks. All locks to be keyed alike, key. Panel trims shall not be capable of being removed when the door is locked.
4. Minimum width shall be 30 inches wide.

C. Interiors:

1. Bus bars shall be of solid copper construction.
2. Bus structure shall be based on UL 67 for size, rating and heat rise.

3. Bus structure and main lugs or main circuit breaker shall have current ratings as shown on the drawings.
4. Bus shall be distributed phase sequence type.
5. Bus shall be designed for bolt-on circuit breakers.
6. Current-carrying parts of the bus assembly shall be plated.
7. Have lugs or main breaker as shown on drawings.

    a. Lugs of main breakers shall be of proper size and type to accept cable as specified and shown on drawings
    b. Lugs shall be UL Listed as suitable for the type conductors specified.

8. Provided with separate Copper ground bus:

    a. Bus to have provisions for a main ground conductor, size as noted on Drawings or as required by NEC.
    b. Provided with sufficient number of branch lugs for number of circuits in the panelboard.

9. Neutral bars shall be of the solid type.
10. Panelboard, as a complete unit, shall have a short-circuit current rating equal to or greater than the integrated equipment rating shown on the panelboard schedule on drawings.

    a. This rating shall be established by testing with the overcurrent devices mounted in the panelboard.

    b. Method of testing shall be per UL Standard 67. Panelboards shall be marked with their maximum short circuit rating at the supply voltage and be UL Listed.

III. Branch Circuit Panelboards:

A. Dead front construction and enclosed in a steel cabinet.

B. UL Listed.

C. Enclosure:

1. Gutters shall be sized in accordance with UL 67.
2. Trims shall be of the type with concealed hinges and trim clamps with no exposed screws or bolts, and have keyed locks. Panel trims shall not be capable of being removed when the door is locked.
3. Minimum width shall be 20 inches wide.

D. Interior:

1. Designed for bolt-on type circuit breakers.
2. Bus bars shall be of solid copper construction.
3. Bus bar connections to branch circuit breakers shall be distributed phase type.
4. Neutral bars shall be of the solid type.
5. Provided with separate Copper ground bus.

a. Bus to have provisions for a main ground conductor.
b. Provided with sufficient number of branch lugs for number of circuits in the panelboard.

6. Bus structure shall be based on UL 67 for size, rating and heat rise.
7. Main breaker or main lugs as shown on drawings. Lugs of main breakers shall be of proper size and type to accept cable as specified and shown on drawings, and be UL Listed as suitable for the type conductors specified.
8. When utilized for service entrance shall be UL Labeled.
9. Panelboard, as a complete unit, shall have a circuit current rating equal to or greater than the integrated equipment rating shown on the panelboard schedule on drawings. Panelboards shall be marked with their maximum short circuit rating at the supply voltage.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Installed plumb and level.

B. When surface mounted, shall be rigidly secured to walls.

C. Location and mounting of panelboards shall be coordinated with all trades prior to setting in place.

D. Wiring shall have rounded corners and be tied off with cable ties.

F. Mounted so highest breaker is no more than 72" AFF.

G. Identification:

1. Provide a machine printed directory, under transparent plastic cover inside panelboard door to identify each circuit load and location.
2. Provide engraved laminated plastic nameplates to panelboard exteriors identifying panel; see Electrical Identification Special Provision
3. Provide engraved laminated plastic nameplates to each branch breaker inside distribution panelboards identifying circuit load and location; see Electrical Identification Special Provision.

II. Adjust And Clean

A. Prior to acceptance of work by Engineer, panelboard locks and trim shall be adjusted to work properly.

B. All lugs, bolts, clamps and screws shall be tightened to manufacturer's specifications.

C. All identification shall be in place.

D. All keys shall be turned over to the Department.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – ELECTRICAL WORK as shown on the Electrical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

2. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – ELECTRICAL WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION PANELBOARDS

PARKING BLOCK REMOVAL AND REPLACEMENT

DESCRIPTION

I. This work shall consist of the complete removal of the existing parking blocks in the parking lot serving the Lockhouse, and the furnishing and installing of parking blocks, complete with paint as directed per plans, after the site work is complete. The existing parking blocks shall be disposed.

MATERIAL

I. Parking Block

A. Concrete parking blocks: Precast, steel reinforced with two #4 bars, air entrained, 4,000 PSI minimum compressive strength. Provide chamfered corners, transverse drainage slots on underside, and a minimum of two factory-formed or drilled vertical holes through parking block for anchoring substrate.

1. Surface Appearance: Free of pockets, sand streaks, honeycombs, and other obvious defects. Corners shall be uniform straight and sharp.
2. Mounting Hardware: Galvanized-steel hardware as standard with parking block manufacturer.

B. Width: 9 inches

C. Length: 7 feet

D. Height: 5 inches

II. Paint

A. Shall comply with IDOT Article 1095.02.

CONSTRUCTION REQUIREMENTS

I. Parking Block Removal

A. The parking blocks shall be pulled and removed in their entirety.

B. If an anchor post breaks off during removal, the remaining portion shall be dug out and removed.

C. The parking blocks shall be removed and disposed of by the Contractor in a legal manner.

II. Parking Blocks

A. Install parking blocks according to manufacturer’s written instructions unless otherwise indicated.

B. Place parking blocks in a bed of adhesive before anchoring.

C. Securely anchor parking blocks to the pavement with hardware in each vertical hole in the parking block as recommended in writing by the manufacturer. Recess head of hardware beneath top of parking block.

D. Parking blocks may be painted before or after installation.

E. Prior to applying paint, parking blocks shall be clean, dry, and free of debris.

F. Parking blocks in standard stalls shall be painted white. Parking blocks for ADA stalls shall be painted blue to match the pavement paint.

G. Paint shall not be applied at temperatures below 50°F (10°C), unless approved by the engineer.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

PARKING BLOCK REMOVAL AND REPLACEMENT shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

PARKING BLOCK REMOVAL AND REPLACEMENT will be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to remove and legally dispose of the existing parking blocks. The work shall also include furnishing, painting and installing new parking blocks.

END OF SPECIAL PROVISION – PARKING BLOCK REMOVAL AND REPLACEMENT

PERMANENT STEEL SHEET PILING

DESCRIPTION

This work shall consist of furnishing and installing the permanent sheet piling to the limits and tolerances shown on the plans according to Section 512 of the Standard Specifications.

MATERIAL

The sheet piling shall be made of steel and shall be new material. The sheeting shall have a minimum yield strength of 50 ksi (345 MPa) unless otherwise specified. The sheeting 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 REQUIREMENTS

The Contractor shall verify locations of all underground utilities before driving any sheet piling. Any disturbance or damage to existing structures, utilities or other property, caused by the Contractor's operation, shall be repaired by the Contractor in a manner satisfactory to the Engineer at no additional cost to the Department. The Contractor shall be responsible for determining the appropriate equipment necessary to drive the sheeting to the tip elevation(s) specified on the plans or according to the Contractor's approved design. The sheet piling shall be driven, as a minimum, to the tip elevation(s) specified, prior to commencing any related construction. If unable to reach the minimum tip elevation, the adequacy of the sheet piling design will require re-evaluation by the Department prior to allowing construction adjacent to the sheet piling in question.

METHOD OF MEASUREMENT

This work will be measured in place in square feet (square meters). Sheet piling associated with other work in this contract or for permanent sheet piling that is cut off or driven beyond those dimensions shown on the plans will not be measured for payment.

BASIS OF PAYMENT

This work will be paid for at the contract unit price per square foot (square meter) for PERMANENT STEEL SHEET PILING at the location shown on the plans.

END OF SPECIAL PROVISION – PERMANENT STEEL SHEET PILING

PIPE AND PIPE FITTINGS FOR SUMP PUMP

GENERAL

I. Provision includes Sump Pump piping shown on the Drawings and/or required in the project to provide complete and operational systems for sump pump discharge.

II. Quality Assurance

A. Welding material and labor to conform to ASME Code and applicable State Labor Regulations.

B. Use welders fully qualified and licensed by state authorities.

C. Domestic Water Piping, Drainage, and Vent Piping: Illinois Plumbing Code

D. Gas Piping shall conform to NFPA 54.

E. Water Service Piping shall conform to AWWA.

F. Each item of equipment furnished under these Specifications is to be essentially the standard product of the manufacturer; however, component parts of equipment need not be products of one manufacturer.

G. All material and equipment shall be of the best quality normally used in good commercial practice, being products of a reputable manufacturer. Each major component shall bear a nameplate stating name and address of the manufacturer and catalog number or designation. All materials shall be of the manufacturer's latest design standard, and bear Underwriter's Laboratories, Inc. label and the manufacturer's trademark.

III. Delivery, Storage, and Handling

A. Except for concrete, corrugated metal, hub-and-spigot, clay, and similar units of pipe, provide factory-applied plastic end caps on each length of pipe and tube. Maintain end-caps through shipping, storage and handling as required to prevent pipe-end damage and eliminate dirt and moisture from inside of pipe and tube.

B. Where possible, store pipe and tube inside and protected from weather.

C. When necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

D. Protect flanges and fittings from moisture and dirt by inside storage and enclosure, or by packaging with durable, waterproof wrapping.

MATERIAL REQUIREMENTS

I. Piping Service And Fitting Schedule

	SERVICE	OPERATING PRESSURE PSIG (Max.)	PIPE & JOINT SPEC. NO.	LINE STRAINERS
A.	Sump Discharge Piping		1	None

II. Piping Specification 1

A. Design Pressure: 15 psi

B. Maximum Design Temperature: 120 degrees F.

C. Piping, 3/4" and above:
1. ASTM D1784, Schedule 40 PVC plastic pipe with PVC fittings and couplers with approved use of cleaner, primer and solvent cement.

CONSTRUCTION REQUIREMENTS

I. Ream pipes and tubes.

A. Clean off scale and dirt, inside and outside, before assembly.

B. Remove slag or other foreign material from piping.

C. During construction, until system is fully operational, keep all openings in piping and equipment closed except when actual work is being performed on that item or system.

1. Closures: Plugs, caps, blind flanges or other similar items specifically designed and intended for this purpose.

II. Pipe Erection and Laying

A. Run pipelines straight and true, parallel to building lines with a minimum use of offsets and couplings.

B. Provide such offsets as may be required to provide necessary headroom or clearance and to provide necessary flexibility in pipelines.

C. Changes:

1. Change in direction of pipelines made only with fittings or pipe bends.
2. Changes in size made only with fittings.
3. Do not use miter fittings, face, or flush bushings, or street elbows.
4. All fittings of long radius type, unless otherwise indicated.

D. Use full and double length of pipe wherever possible.

1. Cut pipe to exact measurement and install without springing or forcing except in case of expansion loops where cold springing is indicated.
2. Take particular care to avoid creating, even temporarily, undue loads, forces, or strains on valves, equipment or building elements with piping connections or piping supports.

E. Install piping to allow for expansion and contraction without stressing pipe or equipment connected.

F. Provide clearance for installation of insulation and access to valves, air vents, drains, and unions.

G. Install same type piping material specified for inside building to five (5) feet outside of building.

H. Install piping parallel with or at right angles to walls unless otherwise noted.

I. Sizing:

1. Unless otherwise indicated, install all supply piping, at line size with reduction in size being made only at inlet to control valve or pump.

J. Make reductions in water pipes with eccentric reducing fittings installed to provide drainage and venting.

K. Grade horizontal drainage piping 1/4" per foot minimum for lines 3" in diameter and less. Lines 4" and larger shall be graded at 1/8" per foot, or as indicated on Drawings.

III. Joints

A. Solvent Cement Joints:

1. Comply with pipe manufacturer's recommendations and ASTM D2855.
2. Remove burrs and ream pipe ends.

B. Clean pipe material with approved cleaner and primer as recommended by pipe and solvent manufacturer.

C. Apply solvent cement completely around pipe or fitting, coating all surface areas for a complete chemically bonded joint.

D. Solvent cement shall comply with pipe manufacturer's recommendations and ASTM D2564.

IV. Field Quality Control

A. Before final acceptance of piping, test all systems and prove to be free of leaks.

1. Perform tests under observation of Engineer.
2. Remove, replace, or satisfactorily repair defective work revealed by tests.
3. Make piping repairs with new materials; caulking of screwed joints or pinning shall not be permitted.
4. Repair defective equipment settings.

V. Adjusting and Cleaning

A. Cleaning:

1. Thoroughly clean all parts of installation at completion of work.
2. Remove grease, metal cuttings, and sludge from equipment, pipes, valves, and fittings.
3. Repair any stoppage, discoloration or other damage to finish, furnishings or parts of building due to Contractor's failure to properly clean piping system.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – PLUMBING WORK as shown on the Plumbing Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – PLUMBING WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION - PIPE AND PIPE FITTINGS FOR SUMP PUMP

PORTABLE DAVIT CRANE

DESCRIPTION

This specification relates to the design, materials of construction, fabrication, and the supply of the portable davit crane and pedestal base at the lock intake structure as shown on the plans.

MATERIAL REQUIREMENTS

I. Materials

A. Davit crane shall be hand winch operated with an adjustable boom and rotation of 360 degrees on a sleeve bearing it the base. Lifting capacity shall be 1000 pounds and crane shall be supplied with 36 feet of cable. All construction materials shall meet the following specifications. Provide specified equipment or submit equivalent equipment for approval by the Engineer.

II. Portable Davit Crane

A. Description: Davit Crane, Portable, 1000 lb, 0-540 in, Red

B. Manufacturer: THERN

C. Model: Series 5110M1 (Red Fusibond) with WA25-36NS

III. Pedestal Base

A. Description: Pedestal Base for Series 5110 Crane (include base cover (Model TK3P))

B. Manufacturer: THERN

C. Model: 510 Series Pedestal Base (Painted Red)

IV. Fasteners

A. The pedestal base, mounted to concrete surface on the lock intake structure, shall be fastened with ASTM A193 (Gr. B8) anchor rod with Type 304 stainless steel nuts and washers. The minimum fasteners diameter shall be taken as 5/8 inch, unless indicated otherwise by the plans, or as recommended by the manufacturer. The minimum embedment into concrete shall be 8 inches, unless noted otherwise on the plans, or as recommended by the adhesive anchor system manufacturer to fully develop of anchor rod in tension.

CONSTRUCTION REQUIREMENTS

A. Drawings showing dimensions, essential details, and crane manufacturer’s data are required to locate, install, and operate the portable davit crane shall be submitted for the

engineer's approval.

B. The portable davit crane and appurtenances shall be installed in accordance with the Installation Manual furnished by the manufacturer. Extreme care should be used in the handling, storage, and installation of this equipment to prevent damage or distortion of the equipment and to insure proper performance.

C. A portable davit crane mounting bracket location is shown on the plans for the intake structure. The Contractor is responsible to verify the location with the stop log manufacturer to ensure the recess location designated will allow the crane to easily install and remove stop logs. Notify the Engineer for acceptance, should an alternative crane location be desired. Provide all necessary hardware for connecting the portable davit crane to the stop log system, which shall have a rated capacity equal to, or greater than, that of the portable davit crane system.

METHOD OF MEASUREMENT

This work will be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for at the contract lump sum price for PROTABLE DAVIT CRANE and shall include all labor, materials, and equipments required to furnish and install the portable davit crane system, including, but not limited to, davit crane, cable, mounting bracket, mounting bracket anchors, and the fasteners required to fasten the crane to the stop log lifting device.

END OF SPECIAL PROVISION - PORTABLE DAVIT CRANE

PRIMARY ELEMENTS AND TRANSMITTERS

GENERAL

I. Summary

A. Section Includes:

1. Pressure components.
2. Level components.
3. Temperature components.
4. Limit Components.

II. Quality Assurance

A. Referenced Standards:

1. American National Standards Institute (ANSI).
2. Instrumentation, Systems, and Automation Society (ISA):

a.MC96.1, Temperature Measurement Thermocouples.

3. National Electrical Manufacturers Association (NEMA):

a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).

III. System Description

A. The instruments specified in this Special Provision are the primary element components for the control loops shown on the Drawings and noted in Control Loop Descriptions Special Provision.

IV. Submittals

A. Product Data: Submit manufacturer's published product data for all items.

B. Operation and Maintenance Manuals.

MATERIAL REQUIREMENTS

I. Pressure Components

A. Pressure Transmitters:

1. Acceptable manufacturers:

a. Rosemount, Model 2051.
b. Foxboro, I/A series.
c. Honeywell ST700.

2. Materials:
   a. Isolating diaphragm: 316 stainless steel.
   b. Process flanges and adapters: 316 stainless steel.
   c. Housing: Aluminum.
   d. Vent/drain valve: 316 stainless steel.
   e. Fill fluid: Utilize manufacturer's standard fill.

      1) Ensure fill is suitable for application temperatures.

3. Design and fabrication:

   a. Smart transmitters utilizing microprocessor based electronics.
   b. Output: 4-20 mA DC proportional to pressure.
   c. Nonvolatile EEPROM memory.
   d. Power supply: 24 Vdc.
   e. Adjustable zero and span.
   f. Temperature limits: -4 to 175 DegF.
   g. Overpressure limits: Withstand 150 percent of stated maximum service pressure without damage.
   h. Humidity limits: 0 to 100 percent relative humidity.
   i. Damping: Adjustable between 0 and 32 seconds.
   j. Inaccuracy (includes effects of linearity, repeatability and hysteresis): +/-0.10 percent of calibrated span for 15:1 rangeability.
   k. Stability: +/-0.2 percent of upper range limit for 12 months.
   l. Temperature effect: Total effect including span and zero errors: +/-0.2 percent of upper range limit per 100 DegF for minimum 15:1 rangeability.
   m. Minimum 1/2 IN pressure connection.
   n. Equip with test jacks or accessible terminals for testing output.
   o. Equip with isolation valve and test connections with isolation valves and/or plugs.

B. Pressure Switches:

1. Acceptable manufacturers:

   a. Mercoid.
   b. Automatic Switch Company.
   c. United Electric.

2. Materials:

   a. Wetted switch elements: 316 stainless steel.
   b. Diaphragm seal housing: 316 stainless steel.
   c. Pressure snubber:

      1) Filter disc: 316 stainless steel.
      2) Housing: 316 stainless steel.

3. Accessories:

a. Provide ball valve to isolate pressure switch from source.
b. Utilize pressure snubbers with porous metal discs to provide pulsation dampening on pressure switch as shown on schedule.
c. On applications where a pressure switch and a pressure gage are used at the same location, it is permissible to utilize one (1) pulsation dampener and diaphragm seal to isolate both elements from the process fluid.

4. Design and fabrication:

a. Utilize hermetically sealed mercury contact switches.
b. Two (2) SPDT contacts rated:

1) 1 amp inductive at 125 Vdc.
2) 5 amp inductive at 120 Vac.

c. Switch set points:

1) Below 1,000 psi:

a) Set points between 30 and 70 percent of switch rated working range.
b) Operating pressure not to exceed 75 percent of switch rated working range.

d. Accuracy: Better than 1 percent of full scale.
e. Process connection: Minimum of 1/4 IN.

C. Pressure Gage:

1. Acceptable manufacturers:

a. Ashcroft.
b. Ametek.

2. Materials:

a. Bourdon tube, socket, connecting tube: 316 stainless steel.
b. Case: Phenolic.

3. Accessories:

a. Provide valve at point of connection to equipment and at panel if panel mounted.
b. Utilize pressure snubbers with porous metal discs to provide pulsation dampening on gage applications as shown on schedule.

4. Design and fabrication:

a. All components suitable for service at:

1) 250 DegF.

2) The maximum process temperature to which the gage is to be exposed.

b. Provide viewer protection from element rupture.
c. Calibrate gages at jobsite for pressure and temperature in accordance with manufacturer's instructions.
d. Unless otherwise required by codes, provide stem mounted or flush mounted, as required, with dial diameter as follows:
e. Equip with white faces, black numerals and black pointers.
f. Gage tapping position to be clear of equipment functions and movements, and protected from maintenance and operation of equipment.

1) Gage to be readable from an accessible standing position.

g. Gage accuracy: 1 percent of full range.
h. Select gage range so that:

1) The normal operating value is in the middle third of the dial.
2) Maximum operating pressure does not exceed 75 percent of the full scale range.

II. Level Elements

A. Ultrasonic Gate Position Sensor and Transmitter:

1. Acceptable Product:

a. Magnetrol Contour

B. Submersible Pressure Sensing Level Transmitter:

1. Acceptable Products:

a.	KPSI	Series 700
b.	Ametek	SST
b.	Blue Ribbon Corp.	BC001 Birdcage Submersible Pressure Sensor

III. Temperature Components

A. Temperature Transmitters:

1. Acceptable manufacturers:

a. Rosemount, Model 3144.
b. Foxboro, I/A series.
c. Honeywell STT 3000.

2. Materials:

a. Housing: Aluminum.

3. Design and fabrication:

a. Smart transmitter utilizing microprocessor based electronics.
b. Input: RTD.
c. Transmitter inaccuracy shall be in accordance with the following:

1) 100 ohm platinum RTD input: +/-[0.25 DegF +0.02 percent of span] or +/-[0.2 DegF +0.025 percent of span] or +/-[0.09 DegF +0.05 percent of span], whichever is greater.

d. Stability:

1) Any of the following drift limits are acceptable:

a) Greater of: 0.1 percent of reading or 0.1 DegC per 12 months.
b) 0.05 percent of input reading plus 0.043 percent of span per 12 months.
c) 0.05 percent of maximum span per 12 months.

e. Ambient temperature effects (including digital, D/A conversion, and cold junction effects):

1) Any of the following effects per 50 DegF change are acceptable:

a) One-half reference inaccuracy plus 0.18 DegF.
b) Effects in accordance with the following inputs:

(1) 100 platinum RTD input: +/-[0.08 DegC +0.025 percent of (reading +200) +0.025 percent of span +0.02 percent of (reading - lower range value)].

f. Ambient temperature limits: -40 to 185 DegF.
g. Output: 4-20 mA DC signal linearly proportional to temperature.
h. Power supply: 24 Vdc.
i. Adjustable span.
j. Adjustable zero.

IV. Limit Components

A. Magnetic Proximity Switches:

1. Acceptable Manufacturers:

a. Rockwell/Allen Bradley
b. General Electric
c. Square D

2. Materials:

a. Type 304 Stainless Steel body.

3. Design and fabrication:

a. NEMA 4X, IP66 rating.
b. Magnetic proximity type, provided with matching magnetic actuator.
c. N.O. or N.C. contacts as required for application.
d. 48VDC, .3A rated contacts for low voltage control circuits.
e. -40 Degree C to +50 Degree C operating temperature range.
f. Rated 200,000,000 operating cycles minimum

V. Accessories

A. Furnish all mounting brackets, hardware and appurtenances required for mounting primary elements and transmitters.

1. Materials, unless otherwise specified, shall be as follows:

a. Bolts, nuts, washers, expansion anchors: 316 stainless steel.
b. Mounting brackets: 316 stainless steel.
c. Mounting plates, angles: 316 stainless steel.

B. Cable lengths between sensors and transmitters shall be continuous (without splices) and as required to accommodate locations as shown on Drawings.

1. Contactor shall be responsible for determining required cable lengths based upon his proposed conduit routing.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Install products in accordance with manufacturer's instructions.

B. Instrument Mounting:

1. Mount all instruments where they will be accessible from fixed ladders, platforms, or grade.
2. Mount all local indicating instruments with face forward toward the normal operating area, within reading distance, and in the line of sight.
3. Mount instruments level, plumb, and support rigidly.
4. Mount to provide:

a. Protection from heat, shock, and vibrations.
b. Accessibility for maintenance.
c. Freedom from interference with piping, conduit and equipment.

II. Training

A. Provide on-site training performed by manufacturer’s approved technician.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. Dam Control System as shown in the Dam Controls Drawings Volume shall be measured for payment as a single lump sum item.

2. Lock Control System as shown in the Lock Drawings Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. Dam Control System shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. Lock Control System shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION – PRIMARY ELEMENTS AND TRANSMITTERS

PROCESS CONTROL BASIC REQUIREMENTS

GENERAL

I. Section includes basic requirements for complete instrumentation system for process control.

II. Quality Assurance

A. Referenced Standards:

1. FM Global (FM).
2. The Instrumentation, Systems, and Automation Society (ISA):

a. 7.0.01, Quality Standard for Instrument Air.
b. S5.1, Instrumentation Symbols and Identification.
c. S5.3, Graphic Symbols for Distributed Control/Shared Display Instrumentation, Logic and Computer Systems.
d. S5.4, Standard Instrument Loop Diagrams.
e. S20, Standard Specification Forms for Process Measurement and Control Instruments, Primary Elements and Control Valves.

3. National Electrical Manufacturers Association (NEMA):

a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).

4. National Fire Protection Association (NFPA):

a. 70, National Electrical Code (NEC).

5. National Institute of Standards and Technology (NIST).
6. Underwriters Laboratories, Inc. (UL).

B. Qualifications:

1. Instrumentation subcontractor:

a. Experience: Have satisfactorily provided a control system for a minimum of five (5) projects of similar magnitude and function.

C. Miscellaneous:

1. Comply with electrical classifications and NEMA enclosure types shown on Drawings.

III. Submittals

A. Product Data:

1. Submittals shall be original printed material or clear unblemished photocopies of original printed material. Facsimile information is not acceptable.

2. Product technical data including:

a. Equipment catalog cut sheets.
b. Instrument data sheets: Separate data sheet for each instrument.
c. Materials of construction.
d. Minimum and maximum flow ranges.
e. Pressure loss curves.
f. Physical limits of components including temperature and pressure limits.
g. Size and weight.
h. Electrical power requirements and wiring diagrams.
i. NEMA rating of housings.
j. Submittals shall be marked with arrows to show exact features to be provided.

B. Shop Drawings:

1. Comprehensive set of wiring diagrams.
2. Panel fabrication drawing.
3. PLC/DCS equipment drawings.
4. Nameplate layout drawings.
5. Drawings, systems, and other elements are represented schematically in accordance with ISA S5.1 and ISA S5.3.
6. All panel and wiring drawings shall be provided in both hardcopy and softcopy.

a. Furnish electronic files on CD-ROM or DVD-ROM media.
b. Drawings in MicroStation format.

C. Record Documents:

1. All Shop Drawings shall be modified with as-built information/corrections.

D. O&M Manuals:

1. Provide manufacturer's O&M Manual for all items.
2. Provide a parameter setting summary sheet for each field configurable device.

E. Samples: Submit copy of HMI display graphics.

F. Warranties: Provide copies of warranties and list of factory authorized service agents.

IV. Delivery, Storage, And Handling

A. Do not remove shipping blocks, plugs, caps, and desiccant dryers installed to protect the instrumentation during shipment until the instruments are installed and permanent connections are made.

MATERIAL REQUIREMENTS

I. Performance And Design Requirements

A. System Operating Criteria:

1. Stability: After controls have taken corrective action, as result of a change in the controlled variable or a change in setpoint, oscillation of final control element shall not exceed two (2) cycles per minute or a magnitude of movement of 0.5 percent full travel.
2. Response: Any change in setpoint or change in controlled variable shall produce a corresponding corrective change in position of final control element and become stabilized within 30 seconds.
3. Agreement: Setpoint indication of controlled variable and measured indication of controlled variable shall agree within 3 percent of full scale over a 6:1 operating range.
4. Repeatability: For any repeated magnitude of control signal, from either an increasing or decreasing direction, the final control element shall take a repeated position within 0.5 percent of full travel regardless of force required to position final element.
5. Sensitivity: Controls shall respond to setpoint deviations and measured variable deviations within 1.0 percent of full scale.
6. Performance: All instruments and control devices shall perform in accordance with manufacturer's specifications.

II. Accessories

A. Provide identification devices for instrumentation system components in accordance with Electrical Identification Special Provision.

B. Provide corrosion resistant spacers to maintain 1/4 IN separation between equipment and mounting surface in wet areas and on below grade walls.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Use bottom or side entry only for all conduit entry to instruments and junction boxes rated NEMA 4X.

B. Panel-Mounted Instruments:

1. Mount and wire so removal or replacement may be accomplished without interruption of service to adjacent devices.
2. Locate all devices mounted inside enclosures so terminals and adjustment devices are readily accessible without use of special tools and with terminal markings clearly visible.

II. Field Quality Control

A. Maintain accurate daily log of all startup activities, calibration functions, and final setpoint adjustments.

B. Instrumentation Calibration:

1. Verify that all instruments and control devices are calibrated to provide the performance required by the Contract Documents.
2. Calibrate all field-mounted instruments, other than local pressure and temperature gages, after the device is mounted in place to assure proper installed operation.
3. Calibrate in accordance with the manufacturer's specifications.
4. Bench calibrate pressure and temperature gages.

    a. Field mount gage within seven (7) days of calibration.

5. Check the calibration of each transmitter and gage across its specified range at 0, 25, 50, 75, and 100 percent.

    a. Check for both increasing and decreasing input signals to detect hysteresis.

6. Replace any instrument which cannot be properly adjusted.
7. Stroke control valves with clean dry air to verify control action, positioner settings, and operator functions.
8. Calibration equipment shall be certified by an independent agency with traceability to NIST.

    a. Certification shall be up-to-date.
    b. Use of equipment with expired certifications shall not be permitted.

9. Calibration equipment shall be at least three (3) times more accurate as the device being calibrated.

C. Loop check-out requirements are as follows:

1. Check control signal generation, transmission, reception and response for all control loops under simulated operating conditions by imposing a signal on the loop at the instrument connections.

    a. Use actual signals where available.
    b. Closely observe controllers, indicators, transmitters, HMI displays, recorders, alarm and trip units, remote setpoints, ratio systems, and other control components.

        1) Verify that readings at all loop components are in agreement.
        2) Make corrections as required.

            a) Following any corrections, retest the loop as before.

2. Stroke all control valves, cylinders, drives and connecting linkages from the local control station and from the control room operator interface.
3. Check all interlocks to the maximum extent possible.
4. In addition to any other as-recorded documents, record all setpoint and calibration changes on all affected Contract Documents and turn over to the Department.

D. Provide verification of system assembly, power, ground, and I/O tests.

E. Verify existence and measure adequacy of all grounds required for instrumentation and controls.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION – PROCESS CONTROL BASIC REQUIREMENTS

PROGRAMMABLE LOGIC CONTROLLERS

GENERAL

I. Summary

A. Section includes programmable logic controller (PLC) control system(s), including software, programming, and training.

II. Quality Assurance

A. Referenced Standards:

1. Institute of Electrical and Electronics Engineers, Inc. (IEEE):

a. C37.90.2, Trial-Use Standard Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers.
b. C62.41, Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.

2. National Electrical Manufacturers Association (NEMA):

a. ICS 1, General Standards for Industrial Control and Systems.

B. Qualifications:

1. Installation supervisor shall have had experience in overseeing installation and startup of at least three (3) similar installations.
2. Programmer(s) shall have had experience in programming PLCs for at least two (2) projects of similar size and complexity.

III. Submittals

A. Product technical data including:

1. Annotated hard copies of PLC software programs.

a. Submit program for logic in ladder diagram format as used for the specific PLC system.
b. Annotate program listing to include the following:

1) Written description of each rung's function.
2) Reference to control loop number for each rung where applicable.
3) Reference to instrumentation tag number of I/O devices for each rung where applicable.

c. Provide written descriptions completely defining all function blocks used in program.

d. Provide list of all addresses referenced in logic diagram with description of data associated with each address.

2. Results of factory testing procedures.
3. Drawings containing the following information to be submitted as part of submittals:

a. Arrangement drawings for PLC system components.
b. Panel and enclosure plans, sections and details.
c. Access opening locations and required clearances for each panel and enclosure.
d. Enclosure internal wiring and terminal blocks.

4. Catalog cut sheets containing information on PLC components to be submitted as part of this Specification Section submittals.

B. Certifications:

1. Qualifications of installation supervisor.
2. Qualifications of programmer(s).

C. Operation and Maintenance Manuals:

1. Submit maintenance procedures available to Department.

a Include the location and phone numbers of service centers (including 24 HR "hot lines").
b. Provide specific information including operation and maintenance requirements, programming assistance, troubleshooting guide, parts ordering, field service personnel requests, and service contracts.

MATERIAL REQUIREMENTS

I. Acceptable Manufacturers

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

1. Rockwell Automation, Allen-Bradley.
2. Group Schneider: Modicon.
3. General Electric Company.

II. Performance And Design Requirements

A. The PLC system shall accomplish the control requirements of the loop descriptions, Drawings, and Specifications.

B. PLC programming shall be documented and factory tested.

C. The PLC system shall operate in ambient conditions of 32 to 140 DegF temperature and 5 to 95 percent relative humidity without the need for purging or air conditioning.

D. Environmental Controls:

1. Furnish circulation fans in solid state control system enclosures.
2. Over-temperature switches shall be utilized to provide special cooling if required to maintain operating temperatures within the manufacturer's specified range.
3. Air conditioning applications shall include means of preventing moisture condensation.

E. All PLC control system components shall be capable of meeting or exceeding electromagnetic interference tests per IEEE C37.90.2.

F. Incorporate the following minimum safety measures:

1. Watchdog function to monitor:

    a. Internal processor clock failure.
    b. Processor memory failure.
    c. Loss of communication between processor and I/O modules.
    d. Processor ceases to execute logic program.

2. Safety function wiring: Emergency shutdown switches shall not be wired into the controller.
3. Safe wiring:

    a. Unless otherwise specified, activation of alarms and stopping of equipment shall result from the de-energization of control circuits, rather than the energization of control circuits.
    b. Low voltage control signal wires:

        1) Place in conduit segregated for that purpose only.
        2) Twisted shielded wire pair.
        3) Not located in the same conduit or bundle with power wiring.

4. Initial safety conditions:

    a. Utilize program module to dictate output states in a known and safe manner prior to running of control program.
    b. Utilize program each time PLC is re-initiated and the control program activated.

5. Monitoring of internal faults and display:

    a. Internal PLC system status and faults shall be monitored and displayed.

        1) Monitored items shall include:

            a) Memory ok/loss of memory.
            b) Processor ok/processor fault.
            c) Scan time overrun.

6. Control of programs: Protect access to PLC program loading with password protection or with locked, key operated selector switches.
7. Design PLC system with high noise immunity to prevent occurrence of false logic signals resulting from switching transients, relay and circuit breaker noise or conducted and radiated radio frequency interference.
8. Operator intervention:

    a. Logic system failure shall not preclude proper operator intervention.
    b. Safety shutdown of equipment or a system shall require manual operator intervention before the equipment or system operation may be reestablished.

III. Components

A. PLC System Central Processor Unit (CPU):

1. CPU shall provide communications with other control systems and man-machine interfaces as specified.
2. Memory:

    a. Battery-backed RAM.
    b. EEPROM program back-up:
    Automatically download to RAM in the event RAM is corrupted.

3. Memory battery backup shall be capable of 60 days memory retention with fresh battery.

    a. Provide visual indication of battery status and alarm low battery voltage.
    b. Memory battery backup shall be capable of 14 days memory retention after the "Battery Low" indicating LED is on.

4. Plug-in card design to allow quick field replacement of faulty devices.

    a. Provide unit designed for field replacement and expansion of memory without requiring rewiring or use of special tools.

5. 20 percent minimum spare useable memory capacity after all required programming is in place and operating.

6. Capable of executing all control functions required by the Specifications and Drawings.

7. Built-in three-mode (proportional-integral-derivative) control capabilities.

    a. As directly selectable algorithms requiring no user knowledge of programming languages.

8. On-line reconfigurable.
9. Lighted status indicators for "RUN" and "FAILURE."
10. Capable of manual or automatic control mode transfer from the operating console stations or from within the control strategy.

a. Transfer shall be bumpless and balanceless.

B. Input/output (I/O) Modules:

1. Provide plug-in modular-type I/O racks with cables to connect to all other required PLC system components.
2. Provide I/O system with:

a. I/O solid state boards with status lights indicating I/O status.
b. Electric isolation between logic and field device.
c. Capability of withstanding low energy common mode transient to 1000 V without failure.
d. Incorporate noise suppression design.
e. Capable of meeting or exceeding electrical noise tests, NEMA ICS 1-109.60-109.66.
f. Capable of being removed and inserted into the I/O rack under power, without affecting any other I/O modules in the rack.

3. Input/output connection requirements:

a. Make connections to I/O subsystem by terminating all field wiring on terminal blocks within the I/O enclosure.
b. Prewire I/O modules to terminal blocks.
c. Provide terminal blocks with continuous marking strip.
d. Size terminals to accommodate all active data base points and spares.
e. Provide terminals for individual termination of each signal shield.
f. Field wiring shall not be disturbed when removing or replacing an I/O module.

4. Discrete I/O modules:

a. Interface to ON/OFF devices.
b. I/O status indicator on module front.
c. Voltage rating to match circuit voltage.
d. Output module current rating:

1) Match maximum circuit current draw.
2) Minimum 1.0 continuous A/point for 120 Vac applications.

e. Isolated modules for applications where one (1) module interfaces with devices utilizing different sources of power.

5. Discrete outputs shall be fused:

a. Provide one (1) fuse per common or per isolated output.
b. Provide blown fuse indication.
c. External fusing shall be provided if output module does not possess internal fusing.
d. Fuses provided external to output model shall:

1) Be in accordance with module manufacturer's specifications.

2) Be installed at terminal block.

6. Analog I/O modules:

a. Input modules to accept signals indicated on Drawings or Specifications.
b. Minimum 12 bit resolution.
c. I/O chassis supplied power for powering connected field devices.
d. Differential inputs and outputs.
e. User configurable for desired fault-response state.
f. Provide output signals as indicated on Drawings and Specifications.
g. Individual D/A converter for each output module.
h. Individual A/D converter for each input module.

C. Power Supply Units:

1. Provide regulated power units:

a. Designed to operate with PLC system and shall provide power to:

1) All components of PLC system.
2) All two-wire field instruments.
3) Other devices as indicated on Drawings or Specifications.

b. Capable of supplying PLC system when all of the specified spare capacity is utilized.
c. Each power supply shall be sized such that it will carry no more than 75 percent of capacity under normal loads.

2. Electrical service to PLC system is 105 to 125 V, 60 Hz, +1 percent, 1 PH power.
3. Separate AC circuit breakers shall be provided for each power supply.
4. If the PLC system is field expandable beyond the specified spare capacity, and if such expansion requires power supply modification, note such requirements in the submittals and allow room for power supply modification in the PLC system enclosure.
5. Capable of meeting or exceeding electrical noise tests, NEMA ICS 1-109.60-109.66.
6. Power distribution:

a. Immune to transients and surges resultant from noisy environment.
b. Shall provide constant voltage level DC distribution to all devices.

7. Provide uninterruptible power supply (UPS) to sustain full power to UPS powered loads listed below for a minimum of ten (10) minutes following loss of primary power and to ensure that the transient power surges and dips do not affect the operation of the PLC system.

a. UPS powered loads:

1) All rack mounted PLC components.
2) Local operator consoles.
3) All power supplies furnished with the PLC and associated loads.

4) External components identified on drawings.

D. PLC System Enclosure:

1. Component placement:

a. Mount all controller components vertically within the enclosure to allow maximum convection cooling.
b. Either install power supplies above all other equipment with at least 10 IN of clearance between the power supply and the enclosure top, or adjacent to other components, but with sufficient spacing for circulation of cooling air.
c. Do not place I/O racks directly above the CPU or power supply.
d. Locate incoming line devices (isolation or constant voltage transformers, local power disconnects, surge suppressors, etc.) so as to keep power wire runs within an enclosure as short as possible.
e. If items such as magnetic starters, contactors, relays, and other electromagnetic devices must be located within the same enclosure as the PLC system components, place a barrier with at least 6 IN of separation between the magnetic area and the control area.
f. Place circulating fans close to major heat generating devices.
g. Segregate input/output modules into groups of identical type.

2. Wiring and grounding to be in accordance with NEC.
3. Termination requirements:

a. Make connections to I/O subsystem by terminating all field wiring on terminal blocks within the enclosure.
b. Prewire I/O modules to terminal blocks.
c. Size terminals to accommodate all active database points and spares.
d. Provide terminals for individual termination of each signal shield.
e. Field wiring shall not be disturbed when removing or replacing an I/O module.

E. PLC System Software and Programming:

1. Provide all hardware and programming required to provide communication between the PLC and the man-machine interface.
2. Provide programming to accomplish all control and monitoring requirements of the Drawings and Specifications.
3. Provide two (2) copies of control logic program on 3-1/2 IN disks or on CD.
4. IBM compatible software.
5. Full documentation capability.
6. Provide description for each rung.
7. On/off line programming.
8. Offline simulation prior to download.
9. Two-step commands requiring operator verification prior to deletion of any programming.

IV. Accessories

A. Provide all accessories required to furnish a complete PLC control system to accomplish the requirements of the Drawings and Specifications.

V. Source Quality Control

A. Provide a performance test after factory completion and prior to shipment.

1. Conduct a test where the system is operated continuously and checked for correct operation including loop controls, displays, printing, keyboard functions, alarm responses, and on/off sequencing control.
2. Conduct testing with dummy I/Os to verify each control loop operation.
3. Allow for Department and Engineer representatives to witness testing program.

a. Provide minimum of 15 days notice prior to testing.

4. Do not ship prior to successful completion of this testing program.

VI. Maintenance Materials

A. Furnish Department with the following extra materials:

1. One (1) spare I/O card of each card type for every 10 cards or fraction thereof installed.

a. I/O Card totals shall be for each control system, not each panel.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Install PLC control system in accordance with manufacturer's written instructions.

II. Field Quality Control

A. Employ and pay for services of equipment manufacturer's field service representative(s) to:

1. Inspect equipment covered by these Specifications.
2. Supervise adjustments and installation checks.
3. Maintain and submit an accurate daily or weekly log of all commissioning functions.

a. All commissioning functions may be witnessed by the Engineer.
b. All reports shall be cosigned by the Contractor and the Engineer if witnessed.

4. Conduct startup of equipment and perform operational checks.
5. Provide Department with a written statement that manufacturer's equipment has been installed properly, started up, and is ready for operation by Department's personnel.

III. Demonstration

A. On-Site Training:

1. Provide employee of the manufacturer or certified representative to provide two sessions of operating and maintenance training (each session scheduled for minimum eight (8) hours each) at the Project site after the system has successfully undergone all field testing and acceptance procedures.

a. As a minimum, training shall cover:

1) Hardware overview.
2) Software overview.
3) Maintenance.
4) Trouble shooting.
5) Operation, e.g., changing set points, passwords, etc.

b. Training sessions shall be scheduled on non-successive days if required to instruct all Department's operating personnel.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION – PROGRAMMABLE LOGIC CONTROLLERS

PUBLIC ADDRESS SYSTEM

GENERAL

I. Provision includes materials and services for Public Address Systems as shown on the drawings.

II. Quality Assurance:

A. Standards

1. Electronics Institute of America (EIA)
2. Underwriter's Laboratories (UL)

III. Sequence of Operation:

A. PA System controls and microphones shall be provided at the following locations:

1. LCP-U
2. LCP-D
3. Lockhouse HMI Display Panel.

B. PA System shall be broken down into three separate paging zones:

1. Upstream Approach zone
2. Downstream Approach zone
3. Lock zone.

C. PA System shall be capable of broadcasting voice announcements over any of the three zones through the system microphones.

1. System microphones shall be provided with "Push-To-Talk" buttons which shall activate microphone for voice announcements when pressed.

D. In addition to voice announcements, the PA system shall be capable of broadcasting a horn tone across either the Upstream Approach or Downstream Approach paging zones.

1. Activation of horn tone shall be through pushbuttons located on the Lock Control System control panels.

E. Zone select pushbuttons shall be provided at the control panels for control of which zone the system microphones are connected to for announcements.

1. Pushbuttons located at a control panel shall only provide control for the associated microphone connected to that control panel.
2. Pushbuttons shall be momentary contact type which shall latch the microphone to the zone associated with the pressed pushbutton.
3. Control panel microphone shall remain connected to a zone until another pushbutton at that control station is pressed.

F. The following controls shall be provided at LCP-U:

1. Handheld microphone with coiled cord, side mounted Push-To-Talk button, and hanger inside enclosure cover.
2. "Upstream Page" pushbutton, which shall connect Upstream Approach paging zone to LCP-U microphone.
3. "Lock Page" pushbutton, which shall connect Lock paging zone to LCP-U microphone.
4. "Upstream Horn" pushbutton, which shall sound horn tone on Upstream Approach paging zone for the duration that pushbutton is pressed.

G. The following controls shall be provided at LCP-D:

1. Handheld microphone with coiled cord, side mounted Push-To-Talk button, and hanger inside enclosure cover.
2. "Downstream Page" pushbutton, which shall connect Downstream Approach paging zone to LCP-D microphone.
3. "Lock Page" pushbutton, which shall connect Lock paging zone to LCP-D microphone.
4. "Downstream Horn" pushbutton, which shall sound horn tone on Downstream Approach zone for duration that pushbutton is pressed.

H. The following controls shall be provided at the Lockhouse HMI Display Panel:

1. Desktop microphone with coiled cord and Push-To-Talk button.
2. "Upstream Page" pushbutton, which shall connect upstream paging zone to desktop microphone.
3. "Downstream Page" pushbutton, which shall connect Downstream Approach paging zone to desktop microphone.
4. "Lock Page" pushbutton, which shall connect lock paging zone to desktop microphone.
5. "All Page" pushbutton, which shall connect all three paging zones to desktop microphone.
6. "Upstream Horn" pushbutton, which shall sound horn tone on Upstream Approach zone for duration that pushbutton is pressed.
7. "Downstream Horn" pushbutton, which shall sound horn tone on Downstream Approach zone for duration that pushbutton is pressed.

I. Provide visual indicators at each paging zone control pushbutton which shall be illuminated when the associated paging zone has been selected.

IV. Submittals:

A. Shop Drawings:

1. Wiring diagrams and riser diagram.
2. System sequence of operation.

B. Product Data:

1. Technical data on each component.
2. Materials list.

C. Operating and Maintenance data.

1. Manufacturer's published operation and service manual for each system and/or component.

2. Include operation details, schematics, wiring diagrams, color codings, terminal numbers and component values for printed-circuit boards.

D. Department instruction report.

MATERIAL REQUIREMENTS

I. Voice Paging System:

A. Mark major components with manufacturer's name, model number, and UL label.

B. Use equipment of only one manufacturer.

C. Provide complete system including but not limited to following:

1. Outdoor trumpet horns with transformers.
2. Volume controls.
3. Desktop handset Master Station
4. Power amplifiers.
5. Other accessories required for specified operation of system.
6. Wire and cable system in conduit.

II. Equipment:

A. General: Provide equipment components which perform the system operations indicated in the Sequence of Operation.

1. Equipment listed are the major system components, they are included but shall not limit all equipment required for a complete and operable system.

B. Re-entrant trumpet speakers:

1. Power rating of 30 watts at full range and adjustable to 40 watts.
2. Frequency response 225 to 14,000 HZ and dispersion 100 degrees.
3. A screwdriver adjustable switch set externally to select 30, 15, 7.5, 3.7, 1.8 watts on a 70 volt line or 15, 7.5, 3.7, 1.8 watts on a 25 volt line.
4. Sound pressure 120 Db at 1220 mm 4 FT on axis with 30 watts input.
5. Trumpet approximately 255 mm 10 IN wide, 240 mm 9-1/2 IN high, 265 mm 10-1/2 IN deep, weight 3.6 kg 8 LB and finished in baked enamel.
6. External connections to screw terminals inside terminal housing.
7. Furnish with three-way adjustable bracket.

CONSTRUCTION REQUIREMENTS

I. Installation:

A. Install all components and complete system as indicated and in accordance with manufacturer's recommendations and instructions.

B. Install all wiring in conduit.

C. Shield all input lines.

D. Size amplifiers for project.

II. System Testing:

A. Test and adjust each component and complete system for proper operation, including the various modes. Perform correctional work when required to suit Department and Engineer.

B. Testing shall include all required testing to confirm all functions described in Sequence of Operation.

III. Training:

A. Instruct Department personnel in complete operation of system.

B. The instruction shall be video tapped and two DVD's shall be provided to the Department.

C. The bid shall include two (2) additional trips during the first six months of operation for further instructions and adjustments to the system.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION PUBLIC ADDRESS SYSTEM

RAILING REMOVAL

Description

I. This work shall consist of furnishing all labor, equipment, and materials required to remove and dispose of the existing railing and anchor bolts as shown on the Plans, as specified herein, and as directed by the Engineer.

Material Requirements

I. Epoxy grout for patching anchor bolt holes shall be a 100% solid, two-component, liquid epoxy-resin system, colored best to match the color of the existing concrete, that when mixed with compatible coarse aggregate will produce a high-strength grout that shall not shrink upon curing. The epoxy shall be mixed and placed according to the manufacturer's recommendations.

Construction Requirements:

I. The galvanized steel railing along the east and west sides of the existing lock chamber shall be removed and disposed of. The existing grout and anchor bolts may be used to anchor the proposed railing replacement subject to analysis by the Contractor to verify the structural capability of the existing bolts to resist the prescribed railing design loads. For removal of existing grout and anchor bolts, the bolts shall be removed to a minimum depth of 1-1/2" below the surface of the existing concrete. The resulting holes shall be patched with an epoxy grout and finished to match the existing concrete as close as possible.

Method of Measurement

This work shall be measured for payment from end-to-end of each railing panel that is removed. The lengths shall be added together and the total rounded to the nearest foot.

Basis of Payment

This work shall be paid for at the contract unit price per foot for RAILING REMOVAL.

END OF SPECIAL PROVISION – RAILING REMOVAL

REMOVAL OF EXISTING STRUCTURES

DESCRIPTION

This work shall consist of the removal and satisfactory disposal of portions of the following two existing structures. This work shall be completed in accordance with Section 501 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS

I. Existing Structure No. 1

A. Existing Structure No. 1 is a lock located along the west bank of the Fox River. Existing Structure No. 1 shall be partially removed to the extents shown on the plans. It is assumed that painted steel portions of the removal contain lead based paint. Contractor is responsible for testing and proper removal and disposal of lead based paint and any other regulated substances associated with the structure removal.

B. This work includes partial removal of existing steel sheet piling as required to construct the proposed steel sheet pile seawall along the downstream, right bank of the lock channel as shown on the Plans. Remove, by extraction, the number of steel sheet piling from the existing seawall as required to allow driving of the new steel sheet piles and make the connection to the existing seawall that will remain.

II. Existing Structure No. 2

A. Existing Structure No. 2 is a sluice gate water control structure located in the channel between the McHenry Lock and the McHenry Dam. Existing Structure No. 2 shall be partially removed to the extents shown on the plans. It is assumed that painted steel portions of the removal contain lead based paint. Contractor is responsible for testing and proper removal and disposal of lead based paint and any other regulated substances associated with the structure removal.

BASIS OF PAYMENT

This work shall be paid for at the contract unit price per each for REMOVAL OF EXISTING STRUCTURES NO. 1 and REMOVAL OF EXISTING STRUCTURES NO. 2; respectively, for which said price shall include all labor, materials, and equipment necessary for the satisfactory removal and disposal of the structures described herein.

END OF SPECIAL PROVISION – REMOVAL OF EXISTING STRUCTURES

RESILIENT SHEET FLOORING

GENERAL

I. This Section includes resilient sheet flooring that is to be placed in the Lockhouse Control Room.

II. SUBMITTALS

A. Submit in accordance with the General Conditions:

1. Manufacturer's technical data for each type of resilient flooring and accessory.
2. Manufacturer's standard color chart in the form of actual selections of resilient sheet flooring, including accessories, showing full range of colors and patterns available.
3. Two copies of manufacturer's recommended maintenance practices for resilient sheet flooring and accessories required.
4. Jointing, Termination Details; Includes 8 " x 11" details indicating joint method, termination details including reducers and/or caps required.
5. Moisture Test Results using a Calcium Chloride Moisture Test to be submitted to the Flooring Distributor prior to delivery and installation of resilient sheet flooring. A reading of three (3) pounds per 1000 square feet per 24 hours or less is an acceptable reading.
6. Concrete pH must be under 9. Perform test and submit results to Flooring Distributor.

III. DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in manufacturer's original, unopened containers with labels indicating brand names, colors and patterns, and quality designations legible and intact.

B. Store and protect materials in accordance with manufacturer's recommendations. Teknoflor rolls should be stored vertically.

IV. PROJECT CONDITIONS

A. Verify that Fortifiber "Moistop" Underslab Vapor Barrier or equal has been installed under work of Section 03300. Concrete contractor shall not create holes in membrane. Repair holes as they appear.

B. Maintain minimum temperature of 70ºF and maximum temperature of 85ºF in spaces to receive resilient flooring for at least one week prior to installation, including all weekend hours, and for not less than 7 days after installation. Permanent heat must be used. Space heaters are not acceptable. Subsequently, maintain minimum temperature of 55ºF and a maximum temperature of 85ºF in areas where work is completed.

C. Store resilient flooring materials in spaces where they will be installed for at least 72 hours before beginning installation.

D. Install resilient flooring and accessories after other finishing operations, including painting, have been completed.

E. Do not install resilient flooring over concrete slabs until they have been cured and are sufficiently dry to achieve bond with adhesive as determined by resilient flooring manufacturer's recommended bond and moisture test. Concrete must be free of curing compounds or adhesives and have a compressive strength of 3500 psi or greater.

F. Close areas to traffic and to other work until flooring is firmly set. Flooring shall have no foot traffic for 24 hours and no heavy fixtures or rolling carts are to be used on the floor for 72 hours.

G. Where solvent based adhesives are used, provide safety, spark-proof fans when natural ventilation is not adequate.

H. Subflooring must be dry.

I. Floor covering should not be installed over expansion joints. Expansion joint covers compatible with floor covering should be used.

J. Do not install floor covering over existing VCT or VAT without using an approved underlayment to hide tile seams.

K. Inspect substrate for any contamination, such as oil drippings, cutback adhesives, etc. Encapsulate contamination with an encapsulator before progressing with the installation of the floor covering. The use of solvent-based adhesive removers is NOT recommended. Mapei's Plan/Patch Plus and Ardex 15 are acceptable coverings. Self-leveling underlayments can have very high moisture contents and require longer curing times, some up to 10 days. Check with a moisture meter before starting installation.

V. EXTRA MATERIALS

A. Furnish one per cent (1%) for each color installed.

VI. WARRANTY

A. Ten (10) year limited warranty commencing on date of substantial completion.

MATERIAL REQUIREMENTS

I. TEKNOFLOR

A. Installer: The installer shall be a certified Teknoflor installer. Call the distributor for certification requirements.

B. Product Description and Physical Characteristics:

1. Teknoflor , *directional* wood-grained, non-cushioned sheet flooring.
2. Width: 6' feet.
3. Nominal Thickness: 2.34 non-cushioned.

4. Test Data:

a. Flammability: Meets or exceeds ASTM D648, Class I (0.45 watts/cm).
b. Smoke Density ASTM-662-94 <450 per ASTM 648-94A Class 1.
c. Residual Indentation: ASTM F1303, 200 lbs applied WT (4,000 PSI).
d. Resistance to Solvents: Complies with ASTM F1303.
e. Slip Resistance: Static Coefficient D-2047-93, in compliance with ADA requirements.
f. Wear Resistance: 12,000 cycles, 500 g. load, S-33 (Taber Abrasion Test, when patterns worn out).
g. Wear Layer: Type 1, Grade 1 per ASTM F1303, embossed clear PVC wear layer of 20".
h. Test Performance: Critical Radiant Flux (ASTM E648-94A) Class 1

C. Equal product may be submitted no later than 7days prior to bid date for approval by Engineer.

II. ACCESSORIES

A. Adhesives: As recommended by flooring manufacturer to suit material and substrate conditions.

B. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.

C. Patching, Leveling, Underlayment: Mastic Latex type equivalent to Camps latex underlayment.

D. Welding Rods: Manufacturer's standard or equal; color as selected.

E. Chemical Weld: Manufacturer's standard or equal.

F. Terminating Reducers: Manufacturer's standard; color as selected.

CONSTRUCTION REQUIREMENTS

I. EXAMINATION

A. Examine subfloor surfaces to determine that they are dry, clean, and smooth.

B. Perform bond and moisture tests on concrete subfloors to determine if surfaces are sufficiently cured and dry as well as to ascertain presence of curing compound. Do not use curing compounds on concrete subfloors.

C. Perform moisture tests in accordance with 1.5 A. 5 & 6.

D. Submit moisture and concrete pH tests to Flooring Distributor before ordering flooring product.

E. Perform bond test at the rate of one per 50 square feet.

F. Do not allow resilient sheet flooring work to proceed until subfloor surfaces are satisfactory. Indicate adverse conditions of any type by letter to Engineer and Flooring Distributor.

II. PREPARATION

A. Sand or grind subfloors to remove mortar, paint, and other surface irregularities.

B. Where leveling is required, apply latex type underlayment in two or more applications. Apply compound in accordance with manufacturer's printed instructions.

C. Remove all debris, sand, and other materials which result in lack of adhesion or telegraphing

III. GENERAL INSTALLATION PROCEDURES-PLEASE CALL US FOR INSTRUCTIONS

A. Install resilient sheet flooring and accessories using method indicated in strict compliance with manufacturer's printed instructions. Extend resilient sheet flooring into toe spaces, door reveals, and into closets and similar openings.

B. Scribe, cut and fit resilient sheet flooring to permanent fixtures, built-in furniture and cabinets, pipes, outlets and permanent columns, walls and partitions. Floor shall be tight to door bucks.

C. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-staining marking device.

D. Tightly cement resilient sheet to sub base without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections. Hand roll resilient sheet flooring at perimeter.

E. Use a 2-part urethane adhesive, recommended by the Flooring Distributor, under any LDR's, extremely heavy hospital beds, or border pieces.

IV. RESILIENT SHEET FLOORING INSTALLATION PROCEDURES

A. Roll out resilient sheet flooring material with top surface up. Trim off all damage edges. Allow material to relax for twenty four (24) hours.

B. Trim off all damaged ends.

C. Straight edge and underscribe all side and end seams.

D. Fold back sheet half-way. Spread adhesive with replaceable blade type notched trowel. Fold sheet into adhesive, allowing for a pattern match.

E. Roll sheet with 150 pound roller. Hand roll all seams.

F. Seams

1. Heat weld all seams:

    a. Route material to accept heat weld roll
    b. Melt matching welding thread into grooves using heat weld gun.
    c. Use guide plate on spatula knife when trimming the weld rod the first time. Wait a minimum of one hour before doing final trim using a Stanley NO. 5005 tool.

2. Chemical weld all seams using Mannington's MLG33 low gloss commercial seam welding.

V. FINISHING AND CLEANING

A. Perform the following initial cleaning operations immediately upon completion of resilient flooring.

1. Sweep or vacuum floor thoroughly to remove any loose dirt, dust and other foreign materials.
2. Scrub floor surface using a buffing machine with a 450 or less RPM maximum speed along with a solution of lukewarm water and mild stripper (pH 9 maximum). After scrubbing is complete, wet-vac surface with heavy duty commercial wet vacuum. Rinse floor thoroughly with clean lukewarm water and again wet-vac surface to remove all excess water.
3. Do not scrub floor with steel wool pads, wire brushes, aggressive floor cleaners or cleansers. These products can cause severe scratching and damage to the floor surface.

VI. PROTECTION

A. Protect resilient sheet flooring against damage during construction period to comply with resilient sheet flooring manufacture's directions. Keep furniture off the floor for 24 hrs. Do not allow rolling carts to be used on the floor for at least 72 hrs.

BASIS OF PAYMENT

Payment for resilient sheet flooring will be made at the lump sum price for LOCKHOUSE - FLOORING.

END OF SPECIAL PROVISION – RESILIENT SHEET FLOORING

RESTROOM ACCESSORIES

GENERAL

I. ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify products using designations indicated.

II. INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

III. CLOSEOUT SUBMITTALS

A. Maintenance data.

IV. QUALITY ASSURANCE

A. 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.

V. WARRANTY

A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.

1. Warranty Period: **15** years from date of Substantial Completion.

MATERIAL REQUIREMENTS

I. RESTROOM ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. A & J Washroom Accessories, Inc.
2. American Specialties, Inc.
3. Bobrick Washroom Equipment, Inc.
4. Bradley Corporation.
5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
6. Tubular Specialties Manufacturing, Inc.

B. Toilet Tissue (Roll) Dispenser:

1. Basis-of-Design Product: Bobrick B-2740.
2. Description: Double-roll dispenser.
3. Mounting: Surface mounted.
4. Operation: Accommodate two standard core toilet tissue rolls up to 6" diameter. Spindles can only be removed with special key furnished. Theft Resistant.
5. Material and Finish: Spindles- High Impact ABS. Bracket – Heavy Duty cast aluminum with satin finish.

C. Combination Towel (Roll) Dispenser/Waste Receptacle

1. Basis-of-Design Product: Bobrick, B-3961.
2. Description: Combination unit for dispensing C-fold or multifold towels, with removable waste receptacle.
3. Mounting: Recessed.

    a. Designed for nominal 4-inch depth.

4. Minimum Towel-Dispenser Capacity: 600 C-fold or 800 multifold paper towels.
5. Minimum Waste-Receptacle Capacity: 12 gal.
6. Material and Finish: Stainless steel, 18-8 S, type 304, 22-guage finish (satin)
7. Liner: Reusable, vinyl waste-receptacle liner.
8. Lockset: Tumbler type for towel-dispenser compartment and waste receptacle.

D. Liquid-Soap Dispenser:

1. Basis-of-Design Product: Bobrick, B-2111.
2. Description: Designed for dispensing soap in liquid or lotion form.
3. Mounting: Vertically oriented, surface mounted.
4. Capacity: 40 fl oz.
5. Materials: Stainless steel, 18-8 S, type 304, 22-guage finish (satin).
6. Lockset: Tumbler type.
7. Refill Indicator: Window type.

E. Grab Bar:

1. Basis-of-Design Product: Bobrick, B6806 x 36 and 6806 x 42.
2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, 18-8 S, type 304, 18 gauge stainless steel tubing with satin finish.
4. Outside Diameter: 1-1/2 inches.
5. Configuration and Length: Straight, 36 inches and 42 inches long.

F. Mirror Unit:

1. Basis-of-Design Product: Bobrick, B-166-1836.
2. Frame: Type 430 Stainless-steel ½" x ½" x 3/8" channel with ¼" return at rear with bright polish finish.

    a. Corners: Mitered and mechanically interlocked

3. Integral Shelf: 5 inches deep.

II. UNDERLAVATORY GUARDS

A. 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:

1. Plumberex Specialty Products, Inc.
2. Truebro by IPS Corporation.

B. Underlavatory Guard:

1. Description: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.
2. Material and Finish: Antimicrobial, molded plastic, white.

CONSTRUCTION REQUIREMENTS

I. FABRICATION

A. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Engineer.

II. INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

BASIS OF PAYMENT

Payment for restroom accessories will be made at the lump sum price for LOCKHOUSE - RESTROOM ACCESSORIES.

END OF SPECIAL PROVISION – RESTROOM ACCESSORIES

RIPRAP
Revised: September 3, 2013

SECTION 281. RIPRAP

Add to Article 281.06 Measurement, the following:

The work will be measured for payment in tons for:

STONE RIPRAP, SPECIAL
SHOT ROCK

Add to Article 281.07 Basis of Payment, the following:

The work will be paid for at the contract unit price per ton for:

STONE RIPRAP, SPECIAL
SHOT ROCK

SECTION 1005. STONE AND BROKEN CONCRETE FOR EROSION PROTECTION, SEDIMENT CONTROL, AND ROCKFILL

Add to Article 1005.01(b) Quality, the following:

All stone for Erosion Protection and Sediment Control, Rockfill, and Shot Rock, shall be Quality A.

Add to Article 1005.01(c) Gradation (1) Stone for Erosion Protection or Sediment Control the following:

EROSION PROTECTION AND SEDIMENT CONTROL GRADATIONS

STONE RIPRAP, SPECIAL Gradation

Percent Passing	Stone Weight (LBS)
100	4,000
50 ± 20	900
15 ± 15	400

Add to Article 1005.01(c) Gradation, the following:

(3) Stone for SHOT ROCK. Stone for Shot Rock shall be quarry run well-graded rock or crushed stone with less than 15 percent of the stones larger than 15 inches in diameter (170 LBS) and less than 20 percent of the stones smaller than 1 inch diameter.

END OF SPECIAL PROVISION – RIPRAP

RIPRAP REMOVAL

DESCRIPTION

I. This work shall consist of removing and disposing of existing riprap and any underlying geotextile fabric at the locations indicated on the plans.

MATERIAL

I. Not applicable.

CONSTRUCTION REQUIREMENTS

I. Riprap, bedding stone

A. The contractor shall ensure all erosion control systems are in place prior to removing any material.

B. All riprap and bedding stone shall be removed completely.

C. All material shall be disposed of by the contractor legally. Any proposed reuse of the riprap on site during construction shall be preapproved by the Engineer prior to proceeding.

D. The contractor is responsible for all disposal fees and testing fees that may be required for the disposal of the riprap in a clean construction debris landfill.

II. Geotextile Fabric

A. Geotextile fabric shall be removed leaving the native soil base.

B. The fabric shall be disposed of legally.

C. The contractor is responsible for all disposal fees that may be required for the disposal of the geotextile fabric.

METHOD OF MEASUREMENT

This work shall be measured for payment as indicated for the items noted below:

RIPRAP REMOVAL shall be measured for payment per square yard of material removed.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

RIPRAP REMOVAL will be paid for at the contract price per square yard, including but not limited to, all labor, materials, equipment and disposal fees required to remove and properly dispose of the existing riprap, bedding stone and geotextile fabric and other items incidental to removing the riprap as shown on the plans.

END OF SPECIAL PROVISION – RIPRAP REMOVAL

ROUGH CARPENTRY

GENERAL

I. This Section consists of furnishing all labor, equipment and materials required to construct concealed wood nailers, blocking, furring, and shims as specified in the construction documents and as directed by the Architect.

II. SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product:

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

1. Wood-preservative-treated wood.

III. WOOD PRODUCTS, GENERAL

A. 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:

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Provide dressed lumber, S4S, unless otherwise indicated.

MATERIAL REQUIREMENTS

I. WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA C2:

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all rough carpentry, unless otherwise indicated.

II. MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Nailers.
2. Blocking
3. Furring
4. Shims

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.

C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine, No. 2 grade; SPIB.
2. Eastern softwoods, No. 2 Common grade; NeLMA.
3. Northern species, No. 2 Common grade; NLGA.
4. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.

III. FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified.

B. Power-Driven Fasteners: NES NER-272.

C. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

CONSTRUCTION REQUIREMENTS

IV. INSTALLATION

A. 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 nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

D. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

BASIS OF PAYMENT

All labor, equipment, materials, supports, hardware, and tools to complete the rough carpentry work at each location where indicated in the construction documents will be paid for at the lump sum price for each structure, LOCKHOUSE - ROUGH CARPENTRY and GATE STRUCTURE - ROUGH CARPENTRY

END OF SPECIAL PROVISION – ROUGH CARPENTRY

RUSTIC FENCE

DESCRIPTION

This work shall consist of furnishing and installing a rustic split rail fence. The Contractor shall use new material and shall not use material salvaged from the removal of the existing fence. The work shall also consist of staining the entire fence with a semi-transparent stain prior to installation.

MATERIAL

I. Split Rail Wood Fence:

A. Style: Two (2) rail wooden split rail fence. Rails and posts shall be constructed of western red cedar.

B. Height: The fence post shall be 78-inches in length. The finished height of the post shall stand 42-inches above grade with rail mortises at 32 inches and 20 inches above grade. Posts shall be a minimum 10 inches in diameter.

C. Rails: The rails shall be 10 feet in length with tenons cut on either end.

II. Wood Sealer:

A. The fence rails and posts shall be prefinished with a semi-transparent exterior oil based stain with a cedar tone. The stain shall be compatible with the cedar.

CONSTRUCTION REQUIREMENTS

I. Split Rail Fence

A. Do not begin prior to completion of final grading.

B. Place assembled fence sections into position and slide rails into posts.

C. Footings

1. Drill undisturbed or compact soil.
2. The diameter of the hole shall be 6 inches larger than the post diameter.
3. Excavate hole to depth of post plus an additional 4 inches for a rock base.
4. Place CA-6 under and around the post in maximum 4-in lifts and tamp for consolidation.
5. Check each post for vertical and top alignment and maintain position during placement and finishing.

II. Cleanup:

A. Upon completion of the installation, debris created by the installation shall be removed and disposed of legally.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

RUSTIC FENCE will be measured for payment as a single lump sum.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

RUSTIC FENCE will be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required for the rustic fence, backfill, and wood sealer as shown on the plans.

END OF SPECIAL PROVISION – RUSTIC FENCE

SECONDARY GROUNDING

GENERAL

I. Provision includes a complete grounded system as required by the NEC and as shown on the drawings.

II. References.

A. National Fire Protection Association (NFPA):

1. NFPA 70 - National Electrical Code (NEC).

B. Underwriters Laboratories, Inc. (UL):

1. All products UL listed and labeled.

C. State of Illinois:

1. Illinois Steel Products Procurement Act, as amended.

III. Submittals

A. Test Results: Submit three copies of ground resistance test results, with list of persons presents.

MATERIAL REQUIREMENTS

I. Ground Rods:

A. Non-rusting, copper-clad rods.

B. 3/4 inch by 10 foot minimum size.

C. Copper to be bonded to a steel core.

D. Minimum copper thickness of 10 mil.

II. Connections:

A. Cable-to-Terminal:

1. One-piece seamless construction with integral solid center barrier, shall be copper for copper to copper connections.
2. UL listed, meet or exceed UL 486 secureness and pullout requirements.

B. Cable-to-Rod:

1. Non-reversible, compression-crimp or exothermic weld only. Bolted connections not acceptable.

C. Ground Straps:

1. Tinned copper braid.
2. Strapped to pipes with pipe clamps that are corrosion resistant, hot dipped galvanized malleable iron saddle and steel U-bolts and nuts.

D. Pipe Connectors:

1. High strength corrosion-resistant ground connector, with silicon bronze hardware.

E. Grounding Bushings:

1. Corrosion-resistant bronze with a mechanical connection for joining a ground wire to a threaded conduit.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Ground Rods:

1. Installed vertically with top 18 inches below finished grade or as shown on Drawings.
2. Connection to rod shall be by non-reversible connection only.
3. Connections shall be made in accordance with connector manufacturers installation instructions.

B. Protective Coating:

1. Connections shall be coated with a protective urethane seal coat after connections are complete.
2. Apply four coats at 15 to 20 minute intervals or in accordance with manufacturers application instructions.

C. Connections:

1. Made with compression type connectors or a molecular weld connection.
2. Made in accordance with manufacturers installation instructions.

D. Ground Straps:

1. Installed on all piping where a meter, expansion joint, or dielectric unions are used in all water and conduit systems or other location where a bonding jumper is required by NEC.

E. Grounding Bushings:

1. Installed on all conduits which contain a ground wire or conduits used for main feeders or subfeeders and as required by NEC.

F. Contact surfaces shall be thoroughly cleaned prior to connections being made.

G. Grounding conductors shall be installed to permit the shortest most direct path to ground.

H. Ground conductors shall be installed in conduit where not enclosed in a cabinet.

I. Solidly ground all electrical equipment.

J. Panelboards and Disconnects.

1. Main Service Disconnect device and first panelboard or disconnect switch on secondary side of transformer shall have the neutral and equipment ground bonded together.
2. All other electrical equipment shall have the neutral isolated from the equipment ground, including panelboards in remote buildings or structures supplied from another building.
3. Ground bars in panelboards and switchboards shall have sufficient lugs for each overcurrent device and incoming equipment ground conductor.
4. Ground bar shall be bonded to device enclosure.

K. Concrete Embedded Elements:

1. Wire mesh or other conductive elements provided in the concrete floor, shall be bonded to the building grounding electrode system and to the building structural steel members.
2. The bonding conductor shall be copper, insulated, covered or bare, #6.
3. Bonding conductor shall be connected to reinforcing steel with exothermic weld only.

II. Field Quality Control.

A. Ground resistance shall be measured using suitable ground resistance measuring equipment.

B. Resistance measurement shall be from the system neutral connection at the service entrance to a convenient ground reference point. The ground reference point should be located to minimize the effects of other existing grounding electrodes.

C. Ground resistance shall not exceed 10 Ohms. When resistance exceeds 10 Ohms, one of the following measures shall be taken to reduce the ground resistance:

1. Drive and bond additional ground rods at two-rod length intervals.
2. Treat the soil in the vicinity of the electrode with metallic salts.
3. Remove soil from around the electrode and replace with bentonite.
4. Use a UL approved electrolytic chemical ground rod.

D. All resistance tests shall be taken no sooner than 48 hours after a measurable rainfall.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. GATE STRUCTURE – ELECTRICAL WORK as shown on the Electrical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

3. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

4. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. GATE STRUCTURE – ELECTRICAL WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

3. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

4. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION SECONDARY GROUNDING

SECURITY CAMERA SYSTEM

GENERAL

I. Provision Includes Security Camera System as specified herein and as shown on drawings.

II. System Description

A. Digital Security Camera System operating on an Ethernet network utilizing TCP/IP protocol.

III. Quality Assurance

A. Installer shall have three (3) years minimum documented experience in the installation of security camera systems.

B. Equipment Supplier:

1. Shall have place of business is within three (3) hours travel time of the job site.
2. Shall stock a full complement of spare parts, including cameras, networking modules, and all panel modules.
3. Be capable of and be certified by equipment manufacturer to perform the input and compiling of all program software required herein at their place of business or at the job site.
4. Shall be capable of and be certified by the equipment manufacturer to perform the programming of memory modules at their place of business or at the job site.
5. Equipment suppliers that do not meet these requirements will not be acceptable.

IV. References

A. Federal Communications Commission (FCC):

1. 47 CFR-Telecommunication, Chapter I.

B. National Electrical Manufacturers Association (NEMA):

C. National Fire Protection Association (NFPA):

1. NFPA-70: National Electric Code (NEC).

D. Underwriters Laboratories (UL):

1. UL 486-A.

V. Submittals

A. Shop Drawings:

1. Complete system circuit diagrams and block wiring diagrams which clearly illustrate how all components relate and how they are interconnected.

2. Point-to-point wiring diagram.

B. Product Data:

1. Provide manufacturer's published product data for each device being provided with appropriate ratings and standards compliance.
2. Copy of manufacturer's standard warranty.

C. Operation and Maintenance Manuals

1. Provide four complete manuals to Using Agency with instructions on the use, maintenance, and operation new components. Manual shall be arranged in a three-ring binder and shall include, but not be limited to, the following:

a. Complete program listing.
b. System operation, maintenance, and installation manual/instructions.
c. Instruction for testing.
d. Trouble-shooting instructions and directory.
e. As-built drawings.
f. Copy of warranty.

D. Record Drawings

1. Contractor shall keep an accurate set of marked-up As-Built Drawings indicating conduit routing floor plans, wiring diagrams, device numbers, and wiring loop numbers in each conduit run.
2. As-built drawings shall be in the O & M Manual.

MATERIAL REQUIREMENTS

I. Acceptable Manufacturers

A. American Dynamics

B. Panasonic

C. Pelco

II. Cameras

A. Design and fabrication:

1. Solid state color camera.
2. Wide dynamic range.
3. High resolution.
4. 1/3 inch CCD color imager.
5. No less than 480 color horizontal lines of resolution.
6. Sensitivity:

a. Day: 0.8 lux, f1.0, 40 IRE, SENS 40X 0.02lux.
b. Night: 0.08 lux, 40 IRE, SENS 49X 0.002 lux.

7. 50dB signal to noise ratio.
8. Provided with 7.5 to 50mm varifocal auto-iris lens.
9. Suitable for outdoor installation.
10. Automatic through-the-lens white balance system.
11. 24VAC operation.

C. Mounting:

1. Provided with appropriate hardware for outdoor pole mounting.
2. Provided with smoked dome enclosure.

D. Video Output:

1. NTSC television system compatible.
2. Composite video output, 1V p-p.

III. Power Supply

A. 120V input ,28VAC output for use with 24VAC cameras.

B. Independent circuit breaker protected outputs for each camera.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Install all system components in accordance with NEC.

B. Install in accordance with manufacturer's written installation instructions.

C. Wiring:

1. Install all wiring in conduit.
2. Contractor shall install wiring in manner that does not damage conductor insulation.
3. Conductors in enclosures shall be carefully formed and harnessed so that each drops off directly opposite to its termination.
4. All wiring shall be inspected and tested to ensure that there are no grounds, opens, or shorts.

D. Installation shall be in a neat and workmanlike manner.

E. Material and equipment shall be the latest standard products of a manufacturer regularly engaged in the manufacturer of the products.

F. Identification:

1. All conductors in conduit containing more than one wire shall be labeled on each end.
2. Wiring identification shall be maintained throughout the installation.

3. All panels shall be provided with engraved nameplates. See Electrical Identification special provision.
4. Cabinet terminals shall be numbered and coded.

G. Enclosure shall be provided with ample gutter space to allow proper clearance between the enclosure and live parts of the panel equipment.

II. Field Quality Control:

A. Provide the services of a factory-authorized service technician for system pre-testing, testing, and adjustment of the system.

B. Testing:

1. Upon completing the installation of all system components and wiring, align, adjust, balance and perform complete system testing.
2. System testing shall determine conformance of the system to the requirements.

3. Verify the absence of unwanted voltages between circuit conductors and ground.
4. Test all conductors for grounds or open circuits.
5. Test all network cabling for proper terminations and losses.

C. Testing Report:

1. Prepare forms for use during system pre-testing to record all pre-testing results.
2. Submit forms used for recording pre-testing results to Engineer for review.
3. Submit letter certifying that system installation is complete and system is performing per the project drawings and specifications. Letter shall include all personnel who performed and witnessed system pre-testing.

D. Correction of Defects:

1. Correct any deficiencies discovered during testing.
2. Replace malfunctioning or damaged components or wiring with new and retest until satisfactory performance and conditions are achieved.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. Dam Control System as shown in the Dam Controls Drawings Volume shall be measured for payment as a single lump sum item.

2. Lock Control System as shown in the Lock Drawings Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. Dam Control System shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. Lock Control System shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION – SECURITY CAMERA SYSTEM

SECURITY FENCE AND GATES, 6-FT

DESCRIPTION

This work shall consist of the installation of a new 6' tall chain link security fence, gates and security end sections. It shall also consist of the reinstallation of salvaged gates and security end sections.

MATERIAL

I. Steel Chain Link Fabric

A. Chain link fabric shall be in accordance with ASTM Standard A491, latest revision; 7'-0" high, made of No. 9 gauge steel wire, woven in a 2 inch mesh, coated with a Class II aluminum coating of 0.4 oz/sf, galvanized, and furnished with a Class 2b polyvinyl chloride bonded coating conforming to ASTM F668. Top and bottom selvages shall have a twisted and barbed finish.

II. Fabric Ties

A. Fabric shall be fastened to the line posts with aluminum tie wires spaced 24 inches apart. Standard fabric stretcher bars and stretcher bar bands shall be furnished where required. Tie wires shall be green vinyl coated.

III. Posts

A. Posts shall be made of galvanized steel pipe, sized as follows:

1.	Line Posts	2.375" OD (3.65 #/ft.)
2.	Terminal (end/corner/pull) Posts	2.875" OD (5.79 #/ft.)
3.	Drive Gate Posts	4.000" OD (9.10 #/ft.)
4.	Man-gate Posts	2.875" OD (5.79 #/ft.)

IV. Tension Wire

A. Metallic Coated Steel Marcelled Tension Wire: 7 gauge (0.177 in.) marcelled wire complying with ASTM A824

B. Type II Zinc-Coated, ASTM A817 Class 5 - 2.0 oz/ft²

V. Barbed Wire

A. Barbed wire shall be United States Alumoweld Co. "Alumoweld" Four Point Type Light Weight (two 0.080" diameter strands). If Alumoweld barbed wire is not available, two 12.5 gage strands, with an aluminum coating equal to that specified per the fence fabric, may be substituted.

VI. Top Rails

A. Top rails shall be made of galvanized steel pipe 1 5/8" O.D. 2.27#/ft., provided with couplings approximately every 20 feet. Couplings shall be outside sleeve type and at least 7" long. One coupling in every five shall have a heavy spring to take up expansion

and contraction of the top rail. The rail shall pass through the base of line post tops and form a continuous brace from end to end of each stretch of fence. The top rail shall be securely fastened to terminal posts by means of malleable iron or pressed steel clamps.

VII. Tie Wire and Hog Rings

VIII. Extension Arms

A. For fences with 6 foot fabric, galvanized standard construction extension arms arranged to carry three strands of barbed wire shall be provided for line posts. The topmost strand shall be approximately 12" above the fence. Extension arms shall be 45 degrees to the outside. The three strands of barbed wire on terminal and gate posts and gates shall be attached directly to the vertical post or gate frame.

IX. Galvanizing

A. Galvanized steel pipe for posts, gates, top rail and removable panels shall be in accordance with ASTM Standard A120, latest revision. No used, re-rolled, or open seam material will be permitted. Other fittings and hardware shall be galvanized according to ASTM Standard A153, latest revisions.

X. Bottom Tension Wire

A. The bottom tension wire should be No. 7 gauge aluminum coated spring coil or crimped wire. Minimum weight of coating shall be 0.40 oz/sf of wire surface. Tension wire shall be stretched taut from terminal post to terminal post and evenly fastened to each intermediate post 6 inches above the grade line. Tension wire shall be attached to the fence fabric with aluminum hog rings every 24 inches.

XI. Concrete

A. Concrete shall be Class SI concrete conforming to Section 1020.04 of the Standard Specifications.

XII. Swing Gates

A. Drive gates shall be constructed of 2.875” O.D. (5.79 #/ft. minimum) galvanized steel pipe, 6 feet high overall. Man gates shall be constructed of 2.00” O.D. (2.72 #/ft. minimum) galvanized steel pipe, 6 feet high overall.

B. Gates shall be supplied complete with malleable iron ball and socket hinges, stops, and center rests. The hinges shall permit the gate to swing open over 90 degrees in both directions. Provide latches with integral eye openings for padlocking; padlock accessible from both sides of gate.

CONSTRUCTION REQUIREMENTS

I. Fence Installation

A. Fencing shall be installed after completion of paving operations.

B. The fence shall follow the ground line unless otherwise specified. It shall be neat, plumb, aligned true, stretched taut, and free from sags and bellies. Sufficient terminal posts must be provided to insure that bottom closure shall be within one inch of the ground surface elevation.

C. Terminal Posts (end, corner, pull, brace) and Gate Posts shall be set in concrete footings as shown on the plans. The top of the footing shall be sloped away from the post to drain moisture. The installer shall make sure that the concrete footing extends above adjacent grade a sufficient amount so that the footing will be 1 inch above the finished surface grade.

D. Line posts may be driven in lieu of the concrete anchorage shown on the plans. If driven installation is selected, posts shall be driven to a minimum depth of 48" below finished grade.

E. Install gates, fabric, hardware and barbed wire per plan details.

II. Grounding

A. Provide at least one electrical ground for each 1,000 ft. of fence installed, located near the center of a run, and located away from electrical equipment and service. Provide additional grounds directly under each point where power lines pass over the fence.

B. Vertically drive or drill grounding rods until the top of the rod is approximately 12 in. below the top of the ground. Connect a No. 8 solid copper conductor to the rod and to the fence by a UL-listed method so that each element of the fence is grounded.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

SECURITY FENCE, 6' shall be measured for payment on a per foot basis.

SECURITY FENCE GATES, 6' shall be measured for payment as a per each basis for each size.

6' SECURITY FENCE GATES REINSTALLED and CANTILEVERED 6' TALL SECURITY END SECTION REINSTALLED shall be considered incidental to the SECURITY FENCE, 6'.

CANTILEVERED 6' TALL SECURITY END SECTIONS shall be included for payment as SECURITY FENCE, 6' on a per foot basis.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted be1low:

SECURITY FENCE, 6' will be paid for at the contract price per foot, including, but not limited to, all labor, materials, and equipment required to install the new fencing, fence post footings, hardware, existing salvaged gates and security end sections, and other items incidental to the new fence.

SECURITY FENCE GATE, 6'x 4' SINGLE will be paid for at the contract price per each, including, but not limited to, all labor, materials, and equipment required to install the new gate, hardware, and other items incidental to the new fence.

SECURITY FENCE GATE, 6’x10’ DOUBLE SWING will be paid for at the contract price per each, including, but not limited to, all labor, materials, and equipment required to install the new gate, hardware, and other items incidental to the new fence.

END OF SPECIAL PROVISION – SECURITY FENCE AND GATES, 6 FT

SELECTIVE BUILDING DEMOLITION

GENERAL

I. This section shall consist of preparing the existing lockhouse for remodeling by removing the existing roofing, wall finishes, flooring, millwork, windows, and doors of the existing lockhouse as shown on the plans. This section includes:

A. Demolition and removal of selected portions of building or structure.

B. Salvage of existing items to be reused or recycled.

II. DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Department ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

III. PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

IV. INFORMATIONAL SUBMITTALS

A. Predemolition Photographs or Video: Submit before Work begins.

V. CLOSEOUT SUBMITTALS

A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

VI. QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

VII. FIELD CONDITIONS

A. Department will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Department's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Department as far as practical.

1. Before selective demolition, Department will remove the following items:

a. Furniture
b. Office Equipment
c. Personal Items.

C. Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: The lockhouse has not been tested for presence of regulated substances in the building materials. It is assumed, based on the vintage of the structure, that various regulated substances are present in the building materials scheduled for selective demolition. The material may include, but are not limited to asbestos, mercury, and lead. Contractor shall assume that removal of these materials will include the cost for proper removal and disposal of the waste as a regulated substance. Contractor, at his/her option may perform testing of the building materials to determine the presence of regulated substances. No additional compensation will be made for such testing.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

VIII. WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

MATERIAL REQUIREMENTS

I. PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

CONSTRUCTION REQUIREMENTS

I. EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Engineer.

D. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

II. UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Department will arrange to shut off indicated services/systems when requested by Contractor.
2. Arrange to shut off indicated utilities with utility companies.
3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
4. Disconnect, demolish, and remove, plumbing, and HVAC systems, equipment, and components indicated to be removed.

    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
    c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Department.
    f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
    g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

III. PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

IV. SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
5. Dispose of demolished items and materials promptly.

B. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Department.
4. Transport items to Department's storage area on-site.
5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Engineer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

V. DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Department's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Department's property and legally dispose of them.

VI. CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

BASIS OF PAYMENT

Selective demolition of the lockhouse will be paid for at the contract lump sum price for LOCKHOUSE – SELECTIVE DEMOLITION, and is to include all labor, equipment, supports, hardware, and tools to complete the selective demolition indicated in the construction documents.

END OF SPECIAL PROVISION – SELECTIVE BUILDING DEMOLITION

SHEET METAL FLASHING AND TRIM

GENERAL

This section includes manufactured reglets and counterflashing, formed roof drainage sheet metal fabrications, formed low-slope roof sheet metal fabrications, and formed wall sheet metal fabrications.

I. ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.

1. Include details for forming, joining, supporting, and securing sheet metal flashing and trim, including pattern of seams, termination points, fixed points, expansion joints, expansion-joint covers, edge conditions, special conditions, and connections to adjoining work.

II. INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

III. CLOSEOUT SUBMITTALS

A. Maintenance data.

IV. QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

V. WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within **20** years from date of Substantial Completion.

MATERIAL REQUIREMENTS

I. SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed; 2D (dull, cold rolled) finish.

C. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
2. Surface: Manufacturer's standard clear acrylic coating on both sides.

II. UNDERLAYMENT MATERIALS

A. Polyethylene Sheet: 6-mil- thick polyethylene sheet complying with ASTM D 4397.

B. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

C. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C).
2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C).

D. Slip Sheet: Building paper, 3-lb/100 sq. ft. minimum, rosin sized.

III. MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item 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 or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
b. Blind Fasteners: High-strength stainless-steel rivets suitable for metal being fastened.

2. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
3. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.

C. Solder:

1. For Stainless Steel: ASTM B 32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.
2. 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.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

H. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

IV. REGLETS

A. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions..

1. Material: Stainless steel, 0.019 inch thick or Galvanized steel, 0.022 inch thick.
2. Finish: With manufacturer's standard color coating to match adjacent surfaces.

CONSTRUCTION REQUIREMENTS

I. FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

1. Obtain field measurements for accurate fit before shop fabrication.
2. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

B. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.

C. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

E. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

F. 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.

II. ROOF DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

1. Accessories: Wire ball downspout strainer.

B. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.

1. Hanger Style: Wrap-Around.
2. Fabricate from the following materials:

a. Galvanized Steel: 0.022 inch thick.

III. LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof-Edge Flashing and Fascia Cap: Fabricate in minimum 96-inch- long, but not exceeding 10-foot- long, sections. Furnish with 6-inch- wide, joint cover plates. Fabricate from the following materials:

1. Stainless Steel: 0.025 inch (24 GA) thick.

B. Base Flashing: Fabricate from the following materials:

1. Stainless Steel: 0.025 inch (24 GA) thick.

C. Counterflashing and Flashing Receivers: Fabricate from the following materials:

1. Stainless Steel: 0.025 inch (24 GA) thick.

D. Roof-Penetration Flashing: Fabricate from the following materials:

1. Stainless Steel: 0.025 inch (24 GA) thick.

IV. WALL SHEET METAL FABRICATIONS

A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- long, but not exceeding 12-foot- long, sections, under copings, at shelf angles, and where indicated. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings. Form with 2-inch- high, end dams where flashing is discontinuous. Fabricate from the following materials:

1. Stainless Steel: 0.016 inch thick.

B. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch- high, end dams. Fabricate from the following materials:

1. Stainless Steel: 0.016 inch thick.

C. Wall Expansion-Joint Cover: Fabricate from the following materials:

1. Stainless Steel: 0.019 inch thick.

V. UNDERLAYMENT INSTALLATION

A. Polyethylene Sheet: Install polyethylene sheet with adhesive for anchorage. Apply in shingle fashion to shed water, with lapped and taped joints of not less than 2 inches.

B. Felt Underlayment: Install felt underlayment with adhesive for temporary anchorage. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

VI. 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 so that completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. 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.

3. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
5. Install sealant tape where indicated.
6. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.

1. Coat back side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

D. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 3/4 inch for wood screws metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal joints as required for watertight construction.

F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches, except reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
2. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

G. Rivets: Rivet joints in uncoated aluminum where indicated and where necessary for strength.

VII. ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets, and straps, spaced not more than 36 inches apart. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet apart. Install expansion-joint caps.

C. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c. in between.

D. Splash Pans: Install where downspouts discharge on low-slope roofs. Set in adhesive material compatible with the roofing.

E. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches (100 mm) in direction of water flow.

VIII. ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.

C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with sealant.

E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

IX. WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

X. 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 and sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

METHOD OF MEASUREMENT

BASIS OF PAYMENT

The work described in this special provision will not be paid for as a separate item, but shall be included in the bid price for the various related items.

END OF SPECIAL PROVISION – SHEET METAL FLASHING AND TRIM

SIGNS

DESCRIPTION

This work shall consist of providing new signs and plaques for the Stratton Lock and Dam replacement project. Specifically, the new signs shall include two new bronze nameplates for the lock and dam structures, new signs for ADA parking stall, new signs for the maintenance docking pier, new signs for the intake structure, new dangerous water signs, and new signs for the channel cable barrier.

MATERIAL

I. Metal Signs (Aluminum and reflective)

A. Sign panels shall conform to Section 1090 of the Standard Specifications.

B. Sign face material shall conform to Section 1091 of the Standard Specifications and MUTDC.

C. Dangerous Water Signs shall have non-reflective black lettering on high intensity white reflective backing.

II. Metal Sign Posts

A. Metal sign posts shall conform to Section 1093.01 of the Standard Specifications.

III. Wood Sign Posts

A. Wood sign posts shall conform to Section 1007.05 of the Standard Specifications.

IV. Concrete Footings

A. Concrete footings shall use Class SI concrete conforming to Section 1020.04 of the Standard Specifications.

V. Bronze Nameplates

A. Bronze nameplates shall be made of bronze and shall conform to Section 515 of the Standard Specifications.

VI. Hardware

A. Mounting hardware shall conform to Section 1006.29 of the Standard Specifications.

VII. Sign Cable

A. Sign cable for the maintenance docking pier and intake structure shall be ¼" yellow plastic coated galvanized steel cable with a breaking strength of 3,700 lbs. Permaflex or equal.

CONSTRUCTION REQUIREMENTS

I. Maintenance Docking Pier and Intake Structure Signs

A. Signs shall be manufactured as shown on the plans.

B. Signs affixed to the maintenance docking pier and intake structure barrier cable shall each use two galvanized cable clamps. The sign shall be centered in the opening.

C. Signs affixed to the chain link fence around the intake structure shall be affixed with two cable clamps.

D. The barrier cable shall have 6 inches of sag across the opening. It shall be affixed to the handrail as shown on the plans.

E. Sign panels shall be installed using all the required supporting channels and mounting hardware.

F. Sign installation shall follow IDOT Articles 720.04.

II. ADA Parking Stall Sign

A. Signs shall be manufactured as shown on plans according to the MUTCD, Illinois Supplement to the National MUTCD, and the Illinois Vehicle Code.

B. Sign panels shall be installed using all the required supporting channels and mounting hardware.

C. Sign installation shall follow IDOT Articles 720.04, 729.03, and 730.03.

III. Dangerous Water Signs

A. Signs shall be manufactured as shown on plans.
B. Signs shall be installed in locations specified on the plans.
    i. At the new dam structure, the sign shall be installed on the dam structure. It shall be fastened to the concrete by means of galvanized concrete expansion anchors. The expansion anchors shall project at least 3 in. into the concrete beyond the back of the sign.
    ii. At the Stratton Obermeyer dam and Algonquin dam locations, the sign shall be affixed to the railing using through bolts and mounting hardware.

IV. Channel Cable Barrier Signs

A. Signs shall be manufactured as shown on the plans.

B. Signs shall be affixed to the channel barrier cable using two galvanized cable clamps. The sign shall be evenly spaced across the channel with the “DANGER” sign positioned in the center.

V. Bronze Nameplates

A. Bronze nameplates shall be installed per Section 515 of the Standard Specifications at the locations indicated on the plans.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

SIGNS shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT.

This work will be paid for as indicated for the various items noted below:

SIGNS will be paid for at the contract lump sum price, including, but not limited to, all labor, materials and equipment required to manufacture and install the new signs and mounting hardware, posts, and other incidental items as shown on the plans.

END OF SPECIAL PROVISION – SIGNS

SIGNS REMOVAL AND REPLACEMENT

DESCRIPTION

This work shall consist of the complete removal of the existing sign panels and sign panel assemblies with their supports and the furnishing, fabricating, and/or installing replacement sign panels and sign panel assemblies with their supports at the gate and lock structures and surrounding areas. This work shall also consist of providing temporary signs during the active boating season.

MATERIAL

I. Sign Panels (Aluminum and reflective)

A. Sign panels shall conform to Section 1090 of the Standard Specifications.

B. Sign face material shall conform to Section 1091 of the Standard Specifications.

C. Signs shall follow MUTCD and the IDNR Sign Manual.

II. Metal Sign Posts

A. Metal sign posts shall conform to Section 1093.01 of the Standard Specifications.

III. Wood Sign Posts

A. Wood sign posts shall conform to Section 1007.05 of the Standard Specifications.

IV. Concrete Footings

A. Concrete footings shall use Class SI concrete conforming to Section 1020.04 of the Standard Specifications.

V. Hardware

A. Mounting hardware shall conform to Section 1006.29 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS

I. Sign Removal

A. Sign Panel Assembly.

1. The sign panel assembly shall be removed from the posts, the supporting channels and the entire support(s) shall be completely removed

B. Sign Panel

1. The sign panel shall be removed completely including all hardware.

C. All holes left from the removal of supports shall be backfilled with suitable material approved by the Engineer. The surface of the filled hole shall be treated to match the surrounding area.

II. Sign Replacement During Boating Season

A. From May 1 through November 1, the Contractor shall maintain the signs either in their original location or in acceptable temporary locations as approved by the Engineer.

B. Temporary locations must be secure and shall prevent the signs from blowing over.

III. Sign Replacement

A. Sign panels shall be installed using all the required new supporting channels and new mounting hardware specified. If no supporting channels or mounting hardware is specified, they shall match or exceed existing.

B. Sign installation shall follow IDOT Articles 720.04, 729.03, and 730.03.

IV. When standard highway signs are to be furnished, they shall be according to the MUTCD.

V. Sign and Post Disposal

A. The removed signs, hardware, and posts shall be disposed of by the Contractor in a legal manner.

METHOD OF MEASUREMENT

SIGNS REMOVAL AND REPLACEMENT shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

SIGNS REMOVAL AND REPLACEMENT will be paid for at the contract lump sum price, including, but not limited to, all labor, materials, equipment required to remove and properly dispose of the existing signs, furnish and install new signs, stage the signs temporarily during boating seasons, and other items incidental to removing and replacing the signs as shown on the plans.

END OF SPECIAL PROVISION –SIGNS REMOVAL AND REPLACEMENT

SITE DEMOLITION

DESCRIPTION

I. This work shall consist of site demolition activities not specified in other special provisions. Specifically this work shall include demolition and disposal activities around the lock, site access road, and work on the two islands.

MATERIAL

I. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of the authorities having jurisdiction. All testing requirements shall be included in the cost of Site Demolition.

CONSTRUCTION REQUIREMENTS

A. Demolition items covered by other special provisions:

1. Tree Removal(6-15 Units Diameter)
2. Tree Removal(Over 15 Units Diameter)
3. Removal and Disposal of Unsuitable Material
4. Sidewalk Removal
5. Removal of Existing Structures No. 1
6. Removal of Existing Structures No. 2
7. Containment and Disposal of Lead Paint Cleaning Residuals
8. Fence Removal
9. Lockhouse – Selective Demolition
10. North Berm Embankment Tree and Vegetation Removal
11. Parking Block Removal and Replacement
12. Rip Rap Removal
13. Sign Removal and Replacement
14. Plumbing and Mechanical Demolition

B. Major items to be demolished and removed include:

1. Lock lane from State Park Road to the lock house parking lot.
2. Guard rail on Lock Lane.
3. Lock house parking lot.
4. Mooring Fence
5. Lock Hand Railing
6. Shrubs and landscaping
7. Site Electrical, including electrical demolition in:
    a. Boiler House
    b. Service Building
    c. PHG Gatehouse

C. Lock Lane and Lock House Parking Lot Demolition

1. The lock lane and lock house parking lot shall remain in service and in drivable condition throughout the contract.

2. Damage to the road shall be repaired with aggregate patching when identified by the Engineer.
3. The lock lane and lock house parking lots shall be cored out

D. Guard Rail Demolition

1. The existing guard rail and posts shall be removed in their entirety and legally disposed of by the contractor.

E. Mooring Fence Demolition

1. The mooring fence wooden piles and cable system shall be removed as shown on the plans. The cable ends on the remaining mooring fence shall be terminated with a Type B connection per the plans in preparation of connecting to the new mooring fence.
2. Demolition of the mooring fence shall be coordinated with the construction phasing of the lock expansion and the installation of the downstream coffer dam.
3. The wooden piles shall be removed to an elevation 2-ft below the finished channel bottom.
4. All material shall be legally disposed of by the contractor.

F. Lock Hand Railing

1. Work shall be coordinated with the lock construction sequencing. The lock handrailing shall be removed only if it is going to be replaced prior to the boating season.
2. The existing lock handrailing shall be removed and legally disposed of in its entirety.
3. Where the handrail is mounted in concrete, the grout bed below the base plate shall be chipped out and the anchor bolts cut flush with the concrete deck. In areas where the concrete deck is being removed, the railing can be cut flush to the grout bed.
4. Where the handrail is mounted to the steel C-channel, the mounting plate shall be cut off flush to the top of the channel. The bare metal shall be temporarily protected with a steel primer.

G. Shrubs and Landscaping

1. All shrubs and landscaping identified for removal in the plans shall be removed and disposed of in accordance with Section 201.08 of the Standard Specifications.
2. All bedding stone, mulch, landscaping rock, bricks and borders shall be removed and legally disposed of in its entirety.

H. Site Electrical

1. The drawings are intended to indicate the scope of work required and to not indicate every box, conduit, or wire that must be removed.
2. Where structures or portions of structures are indicated as being removed on plans, Contractor shall be responsible for the removal of all electrical equipment, devices, fixtures, wiring, systems, etc., from the removed area.

3. Where ceilings, walls, partitions, etc., are temporarily removed and replaced by others, Contractor shall be responsible for the removal, storage, and replacement of equipment, devices, fixtures, raceways, wiring, systems, etc.
4. Verify that abandoned wiring and equipment serve only abandoned equipment or facilities. Extend conduit, wire and equipment to facilities or equipment which shall remain in operation following demolition. Extension of conduit wire equipment shall be compatible with surrounding area.
5. Coordinate work with the Department. Schedule removal of equipment and electrical service to avoid conflicts.
6. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
7. Coordinate utility service outages with the Using Agency and local utility company.
8. Provide temporary wiring and connections to maintain existing systems in service during construction.
9. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
10. Remove, relocate, and extend existing installations to accommodate new construction.
11. Remove abandoned wiring and raceway to source of supply.
12. Remove abandoned raceways, including abandoned raceways below grade.
13. Remove all associated clamps, hangers, supports, etc. associated with electrical removal.
14. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide stainless steel blank cover for abandoned outlets which are not removed.
15. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
16. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
17. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.
18. Repair adjacent construction and finishes damaged during demolition and extension work. Repairs shall match surrounding surfaces not disturbed by demolition.
19. Disconnect and remove abandoned panelboards and distribution equipment.
20. Disconnect and remove abandoned luminaries:
    a. Remove brackets, stems, hangers, and other accessories.
    b. Dispose of existing fixture lamps and ballasts per IEPA requirements.
    c. Provide documentation to Engineer and Department that P.C.B. disposal requirements have been met.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

SITE DEMOLITION shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

SITE DEMOLITION will be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to remove and properly dispose of the all items identified as shown on the plans.

END OF SPECIAL PROVISION – SITE DEMOLITION

SLEEVES, SUPPORTS, HANGERS, ANCHORS AND SEALS

GENERAL

I. Provision Includes:

A. All hangers, supports, anchors, flashing and sleeves for plumbing systems.

B. All hangers, supports, anchors, flashing and sleeves for heating/exhaust systems.

II. Quality Assurance

A. Regulatory Requirements:

1. Illinois Plumbing Code.
2. Underwriter's Laboratories/Factory Mutual, UL/FM: Provide products UL listed and FM approved.

B. Standards:

1. Manufacturer's Standardization Society of the Valve and Fittings Industry, M.S.S.:

a. SP 58: Pipe Hangers and Supports - Materials, Design and Manufacture.
b. SP 69: Pipe Hangers and Supports - Selection and Application.

C. Sheet Metal & Air Conditioning Contractor's National Association, Inc., SMACNA:

1. Duct Hangers; SMACNA Duct Manuals

III. Delivery, Storage And Handling

A. Deliver products wrapped in factory-fabricated fiberboard type containers.

B. Do not install damaged products; replace and return damaged units to manufacturer.

C. Store hangers, supports and anchors in clean, dry space. Store in original cartons and protect from dirt, physical damage and construction traffic.

MATERIAL REQUIREMENTS

I. PIPE HANGERS AND SUPPORTS – Models herein are for identification of type, not finish or material. Hangers and supports shall be 316ss or galvanized stainless steel. Other standard product types are acceptable from same manufactures.

A. Pipe and equipment hangers shall be rated to carry the weight of piping and equipment.

B. Beam Clamps (Standard Duty):

1. B-Line Figs. B3054
2. Fee & Mason Figs. 246

3. Michigan Figs. 360

C. Beam Clamps (heavy duty):

1. B-Line Figs. B3033
2. Fee & Mason Figs. 252, 253
3. Anvil Figs. 133, 134, 218

D. C-Clamps With Locknuts:

1. B-Line Figs. B3516, B3036L, B3031, B3033, B3034
2. Anvil Figs. 93, 94, 95
3. Michigan Figs. 300, 310, 301, 200

E. Brackets (light duty - 750 lbs.):

1. B-Line Figs. B3063
2. Fee & Mason Figs. 153
3. Michigan Figs. 351

F. Brackets (medium-duty - 1500 lbs.):

1. B-Line Figs. B3066
2. Fee & Mason Figs. 151
3. Michigan Figs. 352

G. Brackets (heavy duty - 3000 lbs.):

1. B-Line Figs. B3067
2. Fee & Mason Figs. 155
3. Michigan Figs. 353

H. Hanger Rods, Coach Screw Rods, Eye Rods, U-Bolts:

1. B-Line Figs. B3205, B3213, B3210, B3188
2. Fee & Mason Figs. 250L, 255L, 269, 270
3. Fee & Mason Figs. 267, 263, 219, 228, 176
4. Michigan Figs. 50, 41, 40, 150

I. Clevis Type Hangers:

1. B-Line Figs. B3100
2. Fee & Mason Figs. 239
3. Michigan Figs. 400

J. Adjustable Ring Hanger:

1. B-Line Figs. B3170

K. Concrete Inserts:

1. B-Line Figs. B3022

2. Anvil Figs. 152, 281, 282
3. Michigan Figs. 345

L. Side Beam or Wall Attachment:

1. B-Line Figs. B3060
2. Fee & Mason Figs. 157, 158
3. Michigan Figs. 325

M. Rod Sockets, Couplings, Turn Buckles, Clevises:

1. B-Line Figs. B3203, B3220, B3202, B3201
2. Fee & Mason Figs. 137, 223, 218, 138
3. Michigan Figs. 26, 25, 30, 31

N. Offset Pipe Clamp:

1. B-Line Figs. B3148
2. Fee & Mason Figs. 266
3. Michigan Figs. 700

O. Continuous Channel Strut & Nuts:

1. B-Line Figs. B22 Series
2. Michigan/Eristrut Figs. A12 Series
3. Unistrut Figs. P-1000 Series

P. Auxiliary Steel Angle and/or Pipe: Auxiliary steel angle, channels 'I'-sections for the support of piping or equipment shall be AISI-SAE 1020 low carbon steel or harder.

1. Where piping is used for supports, it shall be Schedule 40 black steel.

Q. Insulation Protection Shields (For piping 2" and less):

1. B-Line Figs. B3151
2. Fee & Mason Figs. 81
3. Michigan Figs. 125

R. Insulation Protection Saddles (For piping 2-1/2" and greater):

1. B-Line Figs. B3160 – B3165
2. Fee & Mason Figs. 171
3. Michigan Figs. 630

S. Pipe Guides:

1. B-Line Figs. B3281 – B3287
2. Fee & Mason Figs. 120
3. Michigan Figs. 650, 651

T. Poured in Place Concrete Inserts:

1.	B-Line	Figs. B2505 – B2508, B3085
2.	Fee & Mason	Figs. 178, 186, 2570, 9000
3.	Michigan	Figs. 355, 375

II. Seals, Safing And Flashing

A. Wall and floor seals: Wall and floor seals shall be modular mechanical type with interlocking synthetic rubber links.

	Manufacturers	Models
1.	Thunderline	No. 300, 400, 500 "Link-Seal"
2.	Clow	No. F-1430, F-1435
3.	Tyler	No. F-796, F-797

B. Escutcheon plates: Escutcheon plates shall be solid steel or cast iron with plain galvanized or chrome facing. Plates shall lock into place with a setscrew.

	Manufacturers	Models
1.	Brasscraft	E02100 SERIES
2.	McGuire	127 SERIES
3.	Ritter	Fig. 1770, 1771, 1772

III. Sealant:

A. Caulking for duct joints and exterior flashing shall be silicone or butyl rubber.

B. Caulking shall be capable of weathering in temperature ranging from -30 degrees F to 180 degrees F and in direct sunlight maintaining its elasticity and its adherence to the material on which it was applied.

C. Caulking color shall be black or where visible shall be chosen by the Engineer.

	Manufacturers	Types
1.	General Electric	Silicone Construction 1200
2.	DAP	One Part Acrylic Sealant
3.	Dow Corning	Silicone Rubber Sealant

CONSTRUCTION REQUIREMENTS

I. Sleeves

A. Where pipes pass through below grade exterior building walls, foundations, beams and slabs on grade, sleeves of Schedule 40 PVC pipe and seals as specified in paragraph 2.2.A. shall be provided.

B. Where pipes pass through interior partition walls and exterior above grade walls, sleeves of Schedule 40 PVC pipe shall be provided.

C. Where pipes pass through interior walls with a one-hour fire rating, sleeves of Schedule 40 galvanized steel pipe shall be provided with fire sealant.

D. Where pipes pass through floors above grade and firewalls, sleeves shall be UL labeled prefabricated with insulation and fireproofing or Schedule 40 galvanized steel pipe with fire sealant.

E. Sleeves for ductwork shall be fabricated from galvanized sheet metal.

F. See details on Drawings for sleeves for fire or smoke dampers in ductwork passing through firewalls.

G. All sleeves shall be sized large enough to allow for movement due to expansion and to provide CONTINUOUS INSULATION. See Section 15250 for insulation thickness.

II. Low Velocity Duct Hangers And Supports

A. All horizontal ducts up to 48" wide shall be supported with strap iron hangers placed down side of duct, turned under bottom of ducts and fastened to ductwork. Straps shall be fastened to building construction by approved methods specified.

B. Rectangular Duct Hanger Sizes:

	Width	Strap	Spacing
1.	Up to 18”	1” x 22 ga.	8 ft.

C. Vertical Duct Floor Support Sizes:

1. Supports shall be riveted or screwed to duct.
2. Up to 60" wide, 1-1/2" x 1-1/2" x 1/8" angle.

III. Hangers And Supports

A. Hangers in General:

1. Provide supports, where pipe changes direction, adjacent to flanged valves, strainers, and fittings and at equipment.
2. Adjustable ring and split ring hangers shall not be used to support insulated piping. Only clevis type hangers shall be used to support insulated piping.
3. Vertical pipe runs shall be supported and laterally braced at every floor level. Support vertical pipe with riser clamps installed below hubs, couplings or lugs, welded to the pipe.
4. Support plastic horizontal sump discharge piping 4 feet O.C.
5. Piping shall be supported at such intervals so that excessive loads will not be placed upon one hanger.
6. Piping shall be properly supported from hangers securely attached to the building construction using clamps for steel construction, anchors for concrete construction or lag screws or bolts for wood construction or as otherwise detailed on drawings or specified.
7. All piping shall be supported in a manner to minimize undesirable stress on bodies of valves and other fittings.
8. All piping shall be supported from walls on brackets, directly from the floor above, or from auxiliary steel.
9. Where exposed structure is available, the pipe shall be supported from this.

10. No cutting, drilling, welding or burning on any structural steel member shall be allowed. Power driven studs and welding studs shall not be allowed.
11. All bolts and threaded rods shall be used with double nut and washer or single nut, washer, and lock washer wherever a single unsecured nut could work loose and allow either threaded rod or supported piping to drop.
12. Cast in place concrete anchors shall be positioned and secured to reinforcing.

B. Hanger Rods in General:

1. Hanger rods for single and double rod hangers shall conform to the following:

	Pipe Size	Hanger Rod Diameter
a.	2" and less	3/8"

C. Auxiliary Steel:

1. Where auxiliary steel is needed for support of equipment or piping, it shall be sized and joined as detailed on drawings or as listed in this Specification.
2. Where piping, ductwork or equipment are hung on trapeze type hangers, the steel should be sized according to the total load on the steel.
3. Where hanger rods must be located where they cannot be vertically hung from structural steel, the structural steel shall be sized according to the "Table of Auxiliary Steel Sizes" in this Specification. Where loading falls between the listed values or the required span is between the listed lengths, the next largest steel size shall be used. Where loading is greater than the listed values, multiple hangers shall be used to lower the loading to below the values listed in the table.
4. Either black iron pipe or angle may be used for auxiliary spans. Pipe spans must be held tight with U-bolts; angle must be held tight to structure with beam clamps. Steel angle spans must be mounted with longest leg of the section in the direction of the supported frame.
5. Table of Auxiliary Steel Sizes Either Pipe Diameter or Angle Dimension:

Span		2'-6"	5'-0"	7'-6"	10'-0"
Pipe Size	Equivalent Load Lb.				
1-1/2"	326	1"	1-1/4"	2"	2-1/2"
		1-1/2x1-1/2x1/8	2x1x1/4	1-1/2x1-1/2x1/4	3/2/5/16
2"	358	1"	1-1/4"	2"	2-1/2"
		1-1/2x-1/2x1/8	2x2x1/4	2-1/2x1-1/2x1/4	3x2x5/16
2-1/2"	415	1"	1-1/2"	2"	2-1/2"
		1-1/2x1-1/2x1/8	2x2x1/4	2-1/2x2x5/16	3-1/2x2-1/2x1/4
3"	474	1"	1-1/2"	2-1/2"	3"
		1-1/2x1-1/2x1/8	2x2x1/4	2-1/2x2x5/16	3-1/2x2-1/2x1/8
4"	586	1-1/4"	1-1/2"	2-1/2"	3"
		1-1/2x1-1/2x1/4	2x2x1/4	3x2x5/16	4x3x1/4
6"	921	1-1/4"	2"	2-1/2"	4"
		1-1/2x2-1/2x1/4	2-1/2x1-1/2x1/4	3-1/2x2-1/2x1/4	4x3-1/2x5/16

IV. Pipe Movement

A. Design and install hangers to resist disengagement from movement of supported pipe.

B. Insulated Piping Movement:

1. Attach clamps including spacer to piping with clamps projecting through insulation.
2. Where low-compressive-strength insulation or vapor barriers are indicated on cold or chilled water piping, install coated protective shields.
3. Install protection saddles where insulation without vapor barrier is indicated.

V. Priming

A. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts and suspended ceiling spaces are not considered exposed.

VI. Sleeves, Seals, Safing, Flashing And Sealant

A. Wall and Floor Seals and Sleeves:

1. Setting:

a. Set sleeves in position in advance of concrete work.
b. Provide suitable reinforcing around sleeves.

2. Sleeves shall be cut the same length as the thickness of the walls and 1-1/2" longer than thickness of floors. 1-1/2" shall extend above the floor.
3. Cuts should be square or round and ground smooth.
4. In below grade exterior walls, foundations, beams and slabs on grade, the annular space between the pipe and the sleeve shall be sealed with a flexible link seal as per this Specification.
5. In interior partition walls and exterior above grade walls, the annular space between the pipe and the sleeve shall be sealed tight with fiberglass insulation and caulk. In firewalls, one-hour fire rated walls and floors above grade the annular space between the pipe and the sleeve shall be sealed tight with fiberglass insulation and fire sealant.
6. Escutcheon plates as specified in this specification, large enough to cover the pipe sleeves shall be installed to complete the seal. Escutcheon plates shall be installed where piping is in finished/occupied areas.
7. Cuts between sleeves and walls or floors shall be patched with mortar to the approval of the Department and the Engineer.

B. Flashing:

1. Flashing shall extend at least 8" underneath lapping roofing. On sloped roofs the lower flashing shall extend 8" over the tope of the roofing and be secured with nails into wood, screws into sheet metal and anchors into concrete.
2. Nails, screws, anchor, and exposed flashing edges shall be covered and sealed with sealant as listed in this Specification.
3. Flashing attached to sheet metal shall be riveted into place with beads of sealant applied between the two metal surfaces and along the exposed edges.
4. All fasteners shall be of the same material as the flashing.
5. Caulking sealant shall not be used to fill gaps in flashing greater than 1/4". Gaps of this size shall be covered by flashing material, fastened and sealed into place.

6. Flashing, sealant and fasteners shall be painted a uniform color.

VII. Low Velocity Duct Hangers And Supports

A. Furnish and install hangers and supports to carry the weight of ductwork, including dampers without incurring vibration, sagging, bending, twisting, buckling, or other deformation in the ductwork or the building structure either during erection, testing, or normal operation. Include as part of the ductwork support systems all necessary auxiliary structural members required to provide support locations where building elements do not occur or are inadequate for attaching loads and as indicated on the Drawings.

B. Each duct shall be hung or supported independently directly to building structure or auxiliary steel without attachments to other supported elements such as piping, conduit, ceilings, equipment or other duct.

C. All horizontal ducts shall be supported with substantial angle and strap trapeze hangers, placed entirely around side and bottom of ducts and securely fastened to the building construction. Angles and straps used to support ducts shall be galvanized. Provide hanger near each circumferential joint.

D. Vertical Ductwork: Unless otherwise indicated support vertical round and rectangular ductwork every 15' or at each floor in building. Unless indicated otherwise by details on Drawings, vertical ductwork shall be supported as specified herein.

VIII. Adjusting And Cleaning

A. Adjust hangers and supports and place grout as required under supports to bring piping and equipment to proper levels and elevations.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. BOILER DEMOLITION as shown on the Mechanical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

2. DAM CONTROLS PROCESS AIR SYSTEM MODIFICATIONS as shown on the Plumbing Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

3. GATE STRUCTURE – MECHANICAL WORK (HVAC) as shown on the Mechanical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

4. GATE STRUCTURE – PLUMBING WORK as shown on the Plumbing Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

5. LOCK GATE MACHINERY as shown on the Mechanical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

6. LOCK PLUMBING WORK as shown on the Plumbing Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. BOILER DEMOLITION shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. DAM CONTROLS PROCESS AIR SYSTEM MODIFICATIONS shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

3. GATE STRUCTURE – MECHANICAL WORK (HVAC) shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

4. GATE STRUCTURE – PLUMBING WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

5. LOCK GATE MACHINERY shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

6. LOCK PLUMBING WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SLEEVES, SUPPORTS, HANGERS, ANCHORS AND SEALS

SLUICE GATES

DESCRIPTION

This work shall consist of furnishing all labor, equipment and materials required to install new or replace existing sluice gates with heavy duty cast iron sluice gates, as indicated by the plans.

A. At the existing upper and lower gate monoliths, the work shall include temporary removal of the existing trash racks, removal and disposal of existing 24 inch sluices gates (gate, frame, stem, guides, stands, and operators), cleaning of the area around new work, cleaning and field painting existing wall thimbles, installing new 24 inch sluices gates (gate, frame, stem, guides, stands, and operators), and reinstalling the existing trash racks.

B. At the new lower gate monolith, the work shall include installing wall thimbles, new 30 inch sluices gates (gate, frame, stem, guides, stands, and operators), and installing new trash racks.

C. At the new lock intake structure, the work shall include installing a wall thimble and 36 inch sluice gate (gate, frame, stem, guides, stand, and operator).

D. At the upper headwall of the proposed gate structure, the work shall include installing a 36 inch wall sleeve and 36 inch sluice gate (gate, stem, guides, stand and operator).

E. Each sluice gate will be furnished and installed complete with wall thimble (where new), operating stem, operating floorstand, electric motor-operated lift mechanism, and other appurtenances or accessories as specified.

F. The sluice gates will be in the quantities and sizes indicated on the plans and listed in the Gate schedule elsewhere in the specifications. Fabricated stainless steel gates are not acceptable.

MATERIAL REQUIREMENTS

I. General

All work will be performed in accordance with the best modern practice for the manufacturer of high-grade machinery. All parts will have accurately machined mounting and bearing surfaces so that they can be assembled without fitting, chipping, or re-machining. All parts will conform accurately to the design dimensions and will be free of all defects in workmanship or material that will impair their service. The sluice gates will be completely shop assembled to insure proper fit and adjustment of all parts. Manufacturers shall have a minimum of five (5) years experience in the design and manufacture of equipment of this type.

II. Design

Liberal safety factors will be used in the design of all equipment. Working stresses will not exceed the lower value of: one third of the yield strength or one fifth of the ultimate strength of the material. The sluice gates and appurtenances will be designed for installation in the structures shown on the plans.

III. Materials

All materials used in construction of the gates and appurtenances will be the best suited for the application and will conform to the following specifications:

Part	ASTM Designation
Iron castings for wall thimbles, frame, disc and guides, stem guides, floorstands, and other items	A-126, Class-B
Bronze castings for wedges, thrust nut, lift nut, and coupling	B-584, C86500
Bronze for seat facings in frame and disc	B-21, C46400
Bronze tongue and guide liners	B98, C65500
Stainless steel for stems	A-276, Type 304
Stainless steel for fasteners	A-276, Type 304
Trash Rack	A-276, Type 304 or 316

IV. Sluice Gates

Sluice gates will be cast iron, fully bronze mounted, and will have side wedges for seating head conditions and side, top, and bottom wedges for unseating head conditions when the width of the gate exceeds 24". All gate components will be designed to safely withstand the heads listed in the Sluice Gate Schedule.

V. Sluice Gate Schedule

Location	Quantity	Size	Design Seating Head	Operating Head	Type Operation
Upper Gate Monolith	2	24" SQ.	10 feet	10 feet	As Specified
Existing Lower Gate Monolith	2	24" SQ.	10 feet	10 feet	As Specified
New Lower Gate Monolith	2	30" SQ.	14 feet	14 feet	As Specified
New Lock Intake Structure	1	36" SQ.	8 feet	8 feet	As Specified
New Gate Bypass Piping	2	36" RND	14 feet	14 feet	As Specified

VI. Frame

The frame will be of cast iron, one-piece construction with mounting flange and rectangular or circular opening as indicated on the plans. All contact surfaces of the frame will be machined. The frame will have machined dovetailed grooves on the front face into which bronze seat facings shall be driven and machined to a 63 micro-inch finish. The back of the frame will be machined to bolt directly to the machined face of a wall thimble, pipe flange, or for mounting on the concrete.

VII. Fasteners

All sluice gate features (frames, guides, operator mounts) and trask racks, where mounted to concrete surface, shall be fastened with ASTM A193 (Gr. B8) with Type 304 stainless steel nuts and washers. The minimum fasteners diameter shall be taken as 5/8 inch, unless indicated otherwise by the plans, or as recommended by the sluice gate manufacturer. The minimum embedment into concrete shall be 5 inches, unless noted otherwise on the plans, or as recommended by the anchor system manufacturer.

Where sluice gates or trash racks are remounted to concrete, existing stainless steel fasteners shall be cut flush with existing concrete and new stainless steel fasteners installed offset from that of the existing anchors. Coordinate hole locations prior to drilling features to be mounted. Locate holes on features to be mounted in accordance with the AISC Steel Construction Manual. The Contractor may reuse existing stainless steel anchors at existing structures, if permitted by the Engineer.

VIII. Disc or Slide

The disc will be of cast iron, one-piece construction, rectangular with integrally cast vertical and horizontal ribs. A reinforcing rib along each side will be provided to insure rigidity between the side wedges. The disc will have machined dovetailed grooves on the seating face into which bronze seat facings shall be driven and machined to a 63 micro-inch finish. A tongue on each side, extending the full length of the disc, will be machined on all sides with a 1/16" clearance maintained between the disc tongue and gate guide groove. Wedge pads for side, top, and bottom wedges, when required, will be cast integrally on the disc and machined to receive adjustable bronze wedges. A heavily reinforced nut pocket will be cast integrally on the vertical centerline and above the horizontal center, and be of such shape to receive the square-backed thrust nut.

IX. Guides

The guides will be cast iron, one-piece, designed to withstand the total thrust due to water pressure and the wedging action. The guides will be machined on all contact surfaces, and a groove will be machined the entire length of the guide to allow 1/16" clearance between the disc tongue and guide groove. The guides will be of such length as to retain and support at least one half the disc in the full open position. The guides will be integrally cast with or attached to the frame with silicon bronze or stainless steel studs and nuts, and will be dowelled to prevent any relative motion between the guides and frame. On sluice gates over 48" wide, a reinforcing rib extending from the guide flange over the top of the wedge seat will be provided. Bronze wedge seats will be securely attached to machined pads on the guides.

X. Pipe Sleeve

The pipe sleeve at the new lower gate monolith, where the operating stem extends through concrete, shall be a minimum inside diameter of 2-1/2 inches, or the diameter of the stem plus ½ inch. Pipe shall be standard size and shall be stainless steel material (Type 304 or 316).

XI. Wedges

The wedges will be solid cast bronze, machined on all contact surfaces. They will be attached to the disc with studs and nuts and will have adjusting screws with lock nuts.

XII. Seat Facings

All seat facings will be malleable extruded bronze of a composition which will increase in wearing ability

with cold working. The extruded seat facings will be of special shape to fill and permanently lock in the machined dovetailed grooves when driven into place. Attaching pins and screws will not be allowed. The installed seat facings will be machined to a 63 micro-inch finish or better.

XIII. Wall Thimbles

Wall thimbles will be furnished for all sluice gates that are not attached to pipe flanges and the sluice gates on the gate structure. Wall thimbles will be as specified on the plans. The depth will be as indicated on the plans and listed in the Gate Schedule. They will be cast iron, one-piece construction of adequate section to withstand all operational and reasonable installation stresses. Wall thimbles will be internally braced during concrete placement. A center ring or water stop will be cast around the periphery of the thimble. The front flange will be machined and have tapped holes for the sluice gate attaching studs, and metal stamped vertical centerlines with the word "top" for correct alignment. Large rectangular wall thimbles will be provided with holes in the invert to allow air to escape during concrete placement beneath the thimble. A permanent gasket for uniform thickness or suitable mastic will be provided between the sluice gate and wall thimble. Where thimbles abut steel pipe sections, provide means to temporarily secure and align the pipe with the thimble to ensure alignment during concrete placement. Wall thimbles for the gate structure shall be plain ended and shall terminate at the face of the wall the gate is being mounted to.

XIV. Stems

The operating stem will be of a size to safely withstand, without buckling or permanent distortion, the stresses induced by normal operating forces. In addition, the stem will be designed to transmit in compression at least 2-1/2 times the rated output of the floorstand or benchstand with a 40 pound effort on the crank or handwheel. The threaded portion of the stem will have machine cut threads of the 29o Acme type. Stems of more than one section will be joined by bronze couplings threaded and keyed to the stems. All threaded and keyed couplings of the same size will be interchangeable. Manually operated, rising stem gates will be provided with an adjustable stop collar on the stem above the floorstand lift nut.

XV. Stem Guides

Stem guides will be cast iron, bronze bushed, mounted on cast iron brackets. They will be adjustable in two directions and will be spaced at sufficient intervals to adequately support the stem. Stem guide spacing will not exceed and L/r ratio of 200, and will not be spaced greater than 10 feet except where required by gate travel.

XVI. Electric Operators and Floorstands

Furnish and install electric motor-operated lift mechanism including:

Electric motor
Reduction gearing
Stem nut
Pedestal
Torque and limit switches
Enclosure strip heaters
Gear case
Handwheel for manual operation.
Provided with clutch mechanism, padlockable in open position, to prevent handwheel operation of valve.

Unit to be complete in a NEMA 4X enclosure requiring only the field connection of 3 PH, 460 V electric powers.

XVII. Painting

The gate manufacturer shall be responsible for shop prime and finish painting of all gates and appurtenances supplied under this contract. All coatings shall conform with VOC Emission Regulations in effect at the manufacturing location and at project site to allow touch-up or recoating to be performed with the same products. The type of paint shall be as specified in the following schedule. Where required by application, the coating shall be approved for contact with drinking water by the NSF, EPA, or other appropriate governing agencies. Number of coats, mil thickness, and surface preparation shall be in accordance with the paint manufacturer's recommendations for that application, but in no case shall be less than the requirements in the following schedule. All coatings shall be free of carcinogens as listed on the IARC monographs.

Colors are to be manufacturer's standards, provided they are selected for ease of field touch-up, color match, and are fade resistant. Colors shall be selected to provide contrast between the product and prime coat, and between the prime coat and finish coat, to insure uniform covering and coating thickness. All coatings shall be applied in accordance with the paint manufacturer's recommendations for thinning, technique, and safety precautions. All coatings shall be produced by Ameron Protective Coating Divisions, Brea, CA, or equal.

CONSTRUCTION REQUIREMENTS

Drawings showing dimensions and essential details required to locate and install the sluice gates shall be submitted for the engineer's approval.

I. Installation and Storage

The sluice gate equipment and appurtenances shall be installed in accordance with the Installation Manual furnished by the gate manufacturer. Extreme care should be used in the handling, storage, and installation of this equipment to prevent damage or distortion of the equipment and to insure proper performance.

II. Flush Bottom Closure

The flush bottom closure type of gate will have a compressible resilient seal attached to the bottom of the disc (sliding member) with a stainless steel bar and fasteners. The seal will be of a specially extruded shape, and designed to accurately fit to the bottom rib of the disc. The seal will be shaped to produce a wide sealing area on a machined cast iron stop bar that is bolted to the gate frame to form a flush invert. The differential sealing pressure of the resilient seal on the stop bar will be variable by adjustment of the side wedges on the gate.

A seating recess is shown on the plans for sluice gates having a flush bottom closure. Prior to casting of concrete, the Contractor is responsible to verify the required size of this recess (or pocket) with the sluice gate manufacturer to ensure the recess is sized accordingly to fit required embedments.

III. Leakage

The sluice gates will be substantially watertight under design head conditions. The leakage will not exceed 0.1 gpm per foot of periphery for seating heads up to 50 feet, and for unseating heads up to 30 feet.

IV. Shop Testing

The completely assembled gate will be shop inspected for proper seating. Seat facings will be machined and wedges adjusted to exclude a 0.004" thickness gauge between the frame and disc seating surfaces. The gate disc will be fully opened and closed in its guide system to insure that it operates freely. Floorstands and benchstands shall be shop operated to insure proper assembly and operation.

V. Existing Trash Racks

Existing trash racks are to be removed and reinstalled as part of the sluice gate installation work at the existing upper and lower monoliths. Upon dewatering of the lock, provide access for the Engineer to inspect the condition of each existing trash rack. The Engineer may direct the Contractor to furnish and install a new rack (in-kind) in place of the existing, if the existing trash rack(s) are deems to be in unsatisfactory condition. For purposes of bid, the Contractor shall assume reuse of the existing trash racks at these locations. Fasten the racks to the monolith in accordance with the "Fasteners" section of this provision.

VI. New Trash Racks

The Contractor shall furnish and install new trash racks for the gates at the new lower monolith, as shown on the plans. These racks shall consist of ASTM A276 (Type 304 or 316) steel bars, welded in accordance with AWS D1.1 and D1.6. Fasten the racks to the new monolith in accordance with the "Fasteners" section of this provision.

VII. Intake Safety Screen

The Contractor shall furnish and install a new intake safety screen at the intake structure sluice gate, as shown on the plans. The safety screen shall consist of ASTM A36 steel members, welded in accordance AWS D1.1. The safety screen shall be galvanized after fabrication according to the requirements of AASHTO M 111.

VIII. Field Adjustment for Lock Sluice Gates

Upon final completion and rewatering of the extended lock, the Contractor shall schedule lock performance testing for observation by the Department and Engineer. The Contractor shall perform a minimum of 10 cycles to fill and empty the lock. The Engineer may advise the Contractor to perform adjustments to the stroke of the sluice gates based on testing observations and retesting after adjustment may be directed. The testing shall be performed at near normal water levels, which shall be accepted by the Engineer at the time of testing. For initial testing of the lock, the sluice gate shall be adjusted as follows:

Location	Qty	Function	Initial Stem Stoke Height (% of Full Stroke)
New Lock Intake Structure	1	Lock Filling	30.3" (of 36") Open Height (84%)
Upper Gate Monolith	2	Lock Filling	24" (of 24") Open Height (100%)
Existing Lower Gate Monolith	2	Lock Emptying	24" (of 24") Open Height (100%)
New Lower Gate Monolith	2	Lock Emptying	20.4" (of 28") Open Height (73%)

METHOD OF MEASUREMENT

The quantity to be paid for under this item will be the number of slide gates complete with electric motor-

operated lift mechanisms, pedestals, stems, thimbles, gate frames and other appurtenances satisfactorily installed and operating properly.

BASIS OF PAYMENT

This work will be paid for at the contract unit price per each for SLUICE GATE, HEAVY of the size specified. Such payment shall include the cost of all labor, equipment and materials required to make the work complete and operable whether or not specifically mentioned herein. Payment shall include, but is not limited to, electric motor-operated lift mechanisms, pedestals, stems, thimbles, gate frames, operator stem pipe sleeves, removing and reinstallation existing trash racks at existing monoliths, furnishing and installing new trash racks at new monoliths, and furnishing and installing the intake structure safety screen (including anchoring systems). Payment shall also include field testing and adjustments to the sluice gates as directed by the Engineer. Payment shall exclude the HDPE trash rack at the intake structure.

END OF SPECIAL PROVISION - SLUICE GATES

STANDBY GENERATOR SYSTEMS

GENERAL

I. Section Includes:

A. Diesel Engine.

B. Generator.

C. Exhaust Silencer.

D. Insulated Weatherproof Enclosure.

E. Automatic Transfer Switch.

F. Generator Controls.

II. Quality Assurance

A. Manufacturer:

1. The generator set shall be tested at the manufacturers' facility and shall meet the following tolerances:

	Item	Units	% Deviation
a.	Corrected Power	kW	+/- 3%
b.	Test Speed	rpm	0% (No Deviation)
c.	Test Power	kW	+/- 1%
d.	Frequency	Hz	+/- 0.2%
e.	Voltage (L-L)	V	+/- 4%
f.	Test Voltage	V	+/- 1%
g.	Line Current	A	+/- 3%
h.	Overshoot	% of High Idle	107%
i.	Voltage Stability	%	+/- 0.5%
j.	Low Idle	rpm	+/- 50%

B. Supplier:

1. It is essential that the engine-generator supplier maintains a local parts and service facility within 200 miles of this installation.
2. Supplier shall carry sufficient inventory to cover not less than 80% parts service within 24 hours and 95% within 48 hours.
3. Supplier shall have factory trained service representatives to furnish all installation, test and start-up supervision necessary for final approval and acceptance as well as perform maintenance and repair on all components as required.

III. Submittals

A. Shop Drawings:

1. Submit detailed drawings of prime mover, generator, generator mated with engine, skid, controls and automatic transfer switch.

B. Product Data: Submit manufacturer's literature noting:

1. Make and model of engine and generator.
2. Makes and models of switchgear and other major auxiliary equipment, including automatic transfer switch, vibration isolators, etc.
3. Manufacturer-produced dimension drawings of the complete engine-generator set clearly showing entrance points for each of the interconnections required.
4. Manufacturer-published kilowatt output curve and published fuel consumption curve.
5. Unit ventilation and combustion air requirements.
6. Manufacturer-published transient response data of the complete engine-generator set upon 50%, 75%, and 100% block loads at 1.0 pf. Data shall include maximum voltage dips, maximum frequency dips, and recovery time periods.
7. Name, address, and phone number of the local service facility and descriptions of the service facilities including parts inventory and number of qualified generator set service personnel.
8. Name and address of laboratory to which oil samples will be sent.
9. Actual electrical diagrams, including schematic diagrams and interconnection wiring diagrams for all equipment to be supplied.
10. Field wiring diagrams showing the number, size, and type of wire needed to connect the generator set to the transfer switch, and annunciators.
11. Manufacturers warranty statements.
12. Engine altitude duration curve.
13. Generator motor starting curves showing the voltage dips versus starting KVA.
14. Manufacturer-published service manuals for engine, generator, and switchgear.
15. Provide total wet weight of complete generator set assembly, including weight of generator, enclosure, silencer, and all fluids.

C. Operating and Maintenance Data:

1. Copies of shop drawings and manufacturer's published service manuals shall be included in the maintenance manual.

IV. Warranty

A. Entire generator system shall be guaranteed against defective parts and workmanship for a period of two years from date of acceptance of the system.

B. Warranty shall include labor and travel time for necessary repairs at the job site.

C. Running hours shall not be a limiting factor for the system warranty.

MATERIAL REQUIREMENTS

I. Manufacturers

A. Acceptable Manufacturers:

1. Caterpillar
2. Kohler
3. Cummins

II. Engine/Generator

A. General:

1. The engine-generator set, including radiator, shall be mounted on a structural steel frame.
2. Ratings:

    a. 80 kW, 100 kVA, Standby service.
    b. 120/240V, 1 PH, 3W
    c. 60 HZ
    d. 0.8 PF
    e. 1800 RPM

3. Generator shall be sized to provide full rated kW output at an altitude of 1000 feet above sea level.

B. Generator:

1. The generator shall be three-phase, single-bearing, synchronous type, wet wound, tropicalized, and built to NEMA standards. Class F insulation shall be used on the stator and rotor.
2. The generator shall include a resettable thermal protector and fuse for exciter/regulator protection against extended low power factor loads and faults.
3. The generator rotor shall be dynamically balanced within 0.0005 in. peak-to-peak amplitude displacements at both ends of shaft and shall sustain 25% overspeed.
4. Current Boost: The generator shall be capable of supporting 300% rated current for ten seconds for selective tripping of downline protection devices when short circuit occurs.

C. Regulator:

1. An automatic volts-per-hertz type, solid-state exciter/regulator, manufactured by the generator manufacturer shall be included and shock mounted inside the generator. Voltage regulation shall be +/- 1% from no load to full rated load. Readily accessible voltage droop, voltage level, and voltage gain controls shall be included in the module. Voltage level adjustment shall be minimum of +/- 10%.
2. The module shall include the following protective features:

    a. Current limit circuits shall restrain the exciter field current while allowing full forcing voltage to be applied to obtain rapid response during transient conditions or service overloading on the generator.
    b. A time-delay circuit shall sense the current limit operation and cut off all field current to the generator after ten seconds.

3. Regulator shall be designed to use in conjunction with solid-state variable speed controllers specified for this job. Provide additional regulator filtering to prevent voltage surges caused by waveform distortion.

D. Engine

1. Watercooled, in-line or Vee type, with four-stroke cycle. Two-stroke cycle type engines will not be considered.
2. Compression ignition diesel which meets specifications when operating on No. 2 domestic burner oil.
3. Equipped with fuel, lube oil, intake air filters, lube oil cooler, fuel transfer pump fuel priming pump, service meter, gear-driven water pump, and instruments, including a fuel pressure gauge, water temperature gauge, and lubricating oil pressure gauge.
4. Governor shall maintain frequency regulation within +/- 3% from no load to full rated load. Steady-state operating band shall be +/- 0.33%.
5. Prealarms provided for low jacket water temperature, low lube oil pressure, and high jacket water temperature in accordance with NFPA 76A.
6. Safety shutoffs for high water temperature, low oil pressure, electrical overspeed, and engine overcrank shall be provided.

E. Cooling System:

1. An engine-mounted radiator with blower-type fan shall be provided to maintain safe operation at 110 degrees F degrees C) ambient temperature.
2. Total air flow restriction to and from the radiator shall not exceed 0.5 in. water (O, 12 kPa). Provide ductwork with flexible connecting section between radiator and discharge louver frame.
3. Cooling System Treatment

    a. Cooling system shall be pretreated by the engine supplier for the inhibition of internal corrosion.
    b. A solution of 50% ethylene glycol shall be added.

F. Exhaust Silencer:

1. A critical, exhaust silencer, muffler companion flanges, and flexible stainless steel bellows-type exhaust fitting properly sized shall be furnished and installed according to the manufacturer's recommendation.
2. Silencer shall be painted with a silver, high heat resisting, silicone aluminum paint.
3. The silencer shall be mounted so that its weight is not supported by the engine nor will exhaust system growth, due to thermal expansion, be imposed on the engine.
4. Exhaust pipe size shall be sufficient to ensure that exhaust backpressure does not exceed the maximum limitations specified by the engine manufacturer.

G. Automatic Starting System:

1. Starting Motor

a. DC electric starting system with positive engagement drive
b. Provided with sufficient capacity to crank the engine at a speed which will start the engine under operating conditions.
c. The starting pinion will disengage automatically when the engine starts.
d. The starting system shall incorporate an automatically reset circuit breaker for antibutt engagement.

2. Automatic Controls

a. Fully automatic generator set start-stop controls in the generator control panel shall be provided.
b. Controls shall provide shutdown for low oil pressure, high water temperature, overspeed, overcrank, and one auxiliary contact for activating accessory items.
c. Controls shall include one 30 second cranking cycle with lockout and manual reset feature.

H. Main Line Circuit Breaker

1. A main line molded case, single throw circuit breaker rated at 104^{o} F (40^{o} C) ambient temperature shall be installed for overload and/or short circuit protection.

a. This rating shall include at least 10% additional capacity for overload and operating temperature rise over 104^{o} F (40^{o} C).
b. See Section 16475.

2. Circuit breaker shall operate both manually for normal switching functions and automatically during overload and short circuit conditions.
3. Generator/exciter field circuit breakers do not meet the above electrical standards and are unacceptable for line protection.
4. Circuit breaker shall have a battery voltage operated shunt trip wired to safety shutdowns to open the breaker in the event of an engine failure and shall meet the Underwriters Laboratories standards.

I. Generator Control Panel

1. Control panel shall be obtained from same manufacturer as generator set and shall include factory warranty and manufacturer's parts and service support.
2. A generator-mounted NEMA 12, vibration isolated, dead front, 14-gauge, steel control panel shall be provided. The control panel shall contain, but not be limited to, the following equipment:

a. Illuminating lights and switch.
b. AC voltmeter, 3-1/2 in. (9 cm), 2% accuracy.
c. AC ammeter, 3-1/2 in. (9 cm), 2% accuracy.
d. Ammeter-Voltmeter phase selector switch.
e. Frequency meter, 3-1/2 in. (9 cm), dial type (45-65 Hz).
f. Automatic starting controls as specified.
g. Voltage level adjustment rheostat.
h. Two sets dry contacts for connection to Hatchery Alarm System:

1) One set of contacts for specified generator pre-alarm conditions.
2) One set of contacts to indicate generator safety shut-down/failure.

i. Fault indicators for low pressure, high water temperature, overspeed, and overcrank.
j. Four-position function switch marked "auto," "manual," "off/reset," and "stop."
k. Hinged, solid protective cover with provision for padlock.

3. Remote Annunciator Panel

a. A panel shall be provided for remote mounting to give audible and visual warning of fault or alarm conditions in the generator set, for the following alarm conditions:

1. Low oil pressure
2. High water temperature
3. Overspeed
4. Low fuel
5. Overcrank
6. Low battery voltage
7. High battery voltage

b. The annunciator shall be equipped with an alarm silence button, a lamp test button, and an alarm horn.

J. Accessories:

1. Jacket Water Heater

a. An engine-mounted thermal circulation tank-type immersion water heater incorporating an adjustable thermostatic switch shall be furnished to maintain engine jacket water to 90 degrees F in a still air ambient temperature of 30 degrees F.
b. The heater shall be 208 Volt, single phase, 3 kW maximum, 60 Hz.

2. Battery and Battery Charger

a. A lead/acid storage battery set of the heavy-duty diesel starting type shall be provided.

1) Battery voltage shall be compatible with the starting system.
2) Batteries shall not be shipped with generator; supplier shall furnish a fully charged set of batteries and install immediately prior to initial start-up of generator.

b. The battery set shall be rated no less than 220-ampere hours.
c. A battery rack constructed in conformance with N.E.C. requirements and necessary cables and clamps shall be provided.

d. Batteries shall be capable of cranking engine at rated ambient for a minimum of five minutes.
e. Charger shall be listed for NFPA 110, NFPA 20, Marine and Industrial service.
f. Charger shall provide fully automatic operation, switching to float mode when batteries are fully charged; AC line voltage compensated; DC voltage regulated; and current limited at rated capacity.

3. Generator Housing:

a. Weather housing shall be constructed of rugged steel, painted inside and out with rust inhibiting primer and an exterior coat of the manufacturer's standard color.
b. Side panels shall be lockable and easily removed for servicing.
c. Top-mounted exhaust silencer with rain shield over the exhaust opening.
d. Entire enclosure shall be insulated and sealed to dampen noise while operating.

3. Sub-Base Fuel Tank Housing:

a. UL Listed, double wall construction.
b. Supplied with generator from manufacturer.
c. Provided with ports as required for all control and monitoring devices.

III. Transfer Switches

A. Automatic Transfer Switch:

1. Provided by the generator set manufacturer which includes factory warranty and manufacturer's parts and service support.
2. Ratings:

a. 120/240V, 1 Phase
b. 400 amp
c. 60 Hz
d. Three (3) pole with overlapping neutral contact.

3. Transfer Switch Mechanism:

a. Shall be mechanically held on both the emergency and the normal side.
b. Rated for continuous duty.
c. Shall be double throw with the main contacts rigidly and mechanically interlocked to ensure only two possible positions: normal and emergency.
d. Provided with a manual operator capable of one-hand manual operation of switch.

4. Each transfer switch shall be listed under UL 1008 in NEMA 1 enclosure.
5. Accessories:

a. Engine starting contacts to provide for generator starting.

b. Full phase protection. Phase relays shall be field adjustable, close differential type with 92 to 95% pickup and 82 to 85% dropout. Relays are to be connected across live lines.
c. Four-position mode selector switch marked "test," "auto," "off," and "engine start."
d. Voltage and frequency monitor on generator output to prevent transfer prior to proper output parameters.
e. Adjustable 0.5 to six (6) second time delay on engine starting to override momentary outages and nuisance voltage dips.
f. Sync-check relay allowing transfer from generator to utility without interruption when the two are in sync.
g. Phase sequence relay permitting transfer in either direction when both sources have same phase rotation.
h. Adjustable 2 to 30 minute time delay on retransfer of load to normal with five (5) minute cool- down timer wherein the generator set runs unloaded after retransfer to normal source.
i. Plant exerciser to start and run the generator set with or without load (selectable) each 168 hours for a 30-minute interval.
j. One auxiliary single-pole double-throw contact for indication of emergency source and one single-pole double-throw auxiliary contact for indication of normal source.
k. Three pilot lights, to indicate the normal and emergency position of the transfer switch and mode selector switch in "off" position.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Generator Unit Assembly

1. Generator shall be bolted to flywheel of engine and assembled as a unit on a rigid steel channel skid.
2. Mount unit on concrete pad as shown on drawings:

a. Concrete pad shall weigh at least as much as complete wet weight of generator, including silencer and enclosure.
b. Contractor shall confirm total wet weight of generator and shall make any adjustments to generator pad size as required such that pad weight exceeds total wet weight of generator package.

3. Entire unit shall be mounted on steel spring type vibration isolators with rubber pads. Anchor isolators if recommended by manufacturer. Isolators shall provide a minimum of 85% vibration attenuation.
4. All final electrical and piping connections to the unit shall be made with flexible connections.
5. System shall be installed as shown on the drawings, and in a neat and workman like manner. Lines shall be installed parallel with and at right angles to floor.

B. Control Panel and Automatic Transfer Switch

1. Install at location shown on plan, rigidly mounted and secured. The unit shall be fully accessible to all serviceable parts including wire lugs when installed in the location shown.

II. Field Quality Control

A. Certification:

1. The manufacturer shall provide a notarized letter certifying compliance with all the requirements of this specification.
2. The certification shall identify, by serial number (s), the equipment involved.
3. No exceptions to the specifications, other than those stipulated at time of submittal, shall be included in the certification.

B. Operator's Manual: Each generator and transfer switch shall be furnished with an operator's manual providing installation and operating instructions.

C. Scheduled Oil Sampling

1. In order to forecast and minimize engine downtime, the supplier of the equipment shall provide an oil sampling analysis kit, which the Department shall utilize for Scheduled Oil Sampling.
2. Scheduled Oil Sampling shall be of the atomic absorption spectrophotometry method and shall be accurate to within a fraction of one part per million for the following elements:

a. Iron
b. Chromium
c. Copper
d. Aluminum
e. Silicon
f. Lead

3 In addition, the sample shall be tested for the presence of water, fuel dilution, and antifreeze.
4. All equipment needed to take oil samples shall be provided in a kit at the time of acceptance and shall include the following:

a. Sample extraction gun (1).
b. Bottles (10).
c. Postage-paid mailers (10).
d. Written instructions.

5. Immediate notification shall be provided to the Department when analysis shows any critical reading. If readings are normal, a report showing that the equipment is operating within established parameters shall be provided.
6. This Scheduled Oil Sampling kit shall be made available, at additional cost, to the Department beyond the mandatory starter kit specified previously and shall be optional for the Department to continue this service after the starter kit has been depleted.

D. Pre-Start-up Inspection: Prior to initial start-up, carefully inspect the following:

1. Wiring, fuel system, exhaust system and cooling system prior to operating generator set. Ensure completeness of installation; ensure that all connections are sound and leak free.
2. Generator set:

    a. Inspect belts for proper tension.
    b. Tighten all loose bolts.
    c. Remove all shipping tags and covers.
    d. Verify proper levels of:

        1) Coolant.
        2) Lubricating Oil.

3. Provide sufficient fuel in fuel tank for required testing, including operation of generator set for a total of two hours during component and system testing.

    a. Fuel level in tank shall just satisfy the low fuel level float switch prior to component testing so that operation during component testing will activate this low level fuel alarm for confirmation of it's operation.

4. Install set of fully charged batteries.

E. Cleaning: Prior to starting generator set, thoroughly clean:

1. Room of dust and debris to prevent pick up by air intake.
2. Generator set of all dirt, dust, and debris.
3. Fuel oil, lubricating oil or coolant spills and residues.
4. All associated equipment.

F. Preparation:

1. Verify fuel levels in tank. Ensure that an adequate supply of specified fuel is available.
2. Inspect battery condition; verify full charge.
3. Prime engine fuel intake manifold.

G. Acceptance test:

1. Make all specified submittals.
2. Demonstrate functional capability at site under manual and automatic modes of operation. Verify that all controls work and that interfaces with automatic dampers, fuel system and transfer switches are properly operating.
3. Demonstrate ability of unit to automatically start and accept load by transfer switch command within 10 seconds. Record all delay times.
4. Perform a full load test using building load and a load bank sufficient to provide 100% specified KW rating for a 2 hour test period. Generator system shall be caused to start and, upon reaching rated speed, pick up 100% load on one step.

Record voltage, amperage, frequency, oil pressure and engine temperature at beginning of test and each hour thereafter. Furnish test report to Engineer.

5. Completely fill fuel tank.
6. Repaint muffler and exhaust pipes.
7. Whenever system fails to operate as specified, correct all defects. Verify that system is operating as specified before concluding tests.

III. Training

A. Provide instruction to Department's personnel in complete operation and maintenance of generator system.

B. Provide two (2) periods of minimum three (3) hours duration when system is fully operational.

C. Instructor shall be a manufacturer authorized instructor knowledgeable in the operation and maintenance of the generator installed at the facility.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION STANDBY GENERATOR SYSTEMS

STEEL RAILING (SPECIAL)

DESCRIPTION

This work shall consist of furnishing and erecting a metal combination vehicle and pedestrian railing (galvanized) at locations shown on the plans. All work shall be according to Section 509 of the Standard Specifications.

METHOD OF MEASUREMENT

This work will be measured for payment in place in feet. The length measured will be the overall length along the top longitudinal railing member through all posts and gaps.

BASIS OF PAYMENT

This work will be paid for at the contract unit price per foot for STEEL RAILING (SPECIAL)

END OF SPECIAL PROVISION – STEEL RAILING (SPECIAL)

STOP LOGS – GATE STRUCTURE

DESCRIPTION

This specification relates to the design, materials of construction, fabrication, supply and installation of the stainless steel stop log guides and invert, the intermediate support post, and the embedded mounting plate assemblies (stop log support system) at the Gate Structure as shown on the plans. The stop log support system shall be manufactured by a Company having a minimum of five (5) years' experience in the design and manufacture of equipment of this type.

Under separate Special Provisions, Stop Logs shall be provided at the Lock and Intake Structure. These stop logs shall be for 21 ft and 7 ft clear frame openings, respectively. The Gate Structure, having three bays at 28 ft shall have stop logs guides configured to accept a combination of Lock and Intake Structure Stop Logs.

MATERIAL REQUIREMENTS

I. Stop Log Frames

All work will be performed in accordance with the best modern practice for the manufacture of high-grade machinery. All parts will have accurately machined mounting and bearing surfaces so that they can be assembled without fitting, chipping, or re-machining. All parts will conform accurately to the design dimensions and will be free of all defects in workmanship or material that will impair their service. The stop log system, frame, and lifting device shall be completely shop assembled to insure proper fit and adjustment of all parts.

A.	Quantity	6 frames
B.	Channel width	3 @ 21 foot Clear Width 3 @ 7 foot Clear Width
	Channel depth	6 foot normal channel depth
C.	Depth of water	6 foot normal channel depth
D.	Seal one or both directions	One direction (Seal toward Hinged Crest Gate)

II. Design

A. Guides

1. The guides shall be of stainless steel, structural shapes or formed plates. The guides shall be designed for maximum rigidity and shall be provided with straps or other approved method on the back of the guides for embedded type to lock it into the concrete. Provide means to fasten the guides back-to-back on opposite sides of the steel post as shown on the Plans. The invert of the frame shall be a stainless steel plate or channel with an approved means of adjusting and anchoring to the base, and shall be welded to the lower ends of the guides to form a seating surface for the resilient seal mounted on the log.

B. Seals

1. Lip type seals shall be attached to the frame to restrict leakage. Indicate orientation (permanent label) near the top of the intermediate post to ensure it is installed in the proper direction upon use.

C. Hardware

1. All necessary attaching bolts and anchor bolts shall be stainless steel and furnished by the stop log manufacturer.

III. Materials

All materials used in construction of the guides and appurtenances will be the best suited for the application and will conform to the following specifications:

A. Frame Aluminum B308 6061-T6

B. Seals

1. Sides: Lip Seal - D2000
Grade 2BC 615
Extruded Neoprene
Durometer 50 ± 5

C. Intermediate Post Assembly

In order to configure the two stop log widths to seal one 28 ft bay, an intermediate structural steel post will be installed to support the ends of six 7 foot long stop logs on one side and six 21 foot long stop logs on the other side. One embedded steel mounting plate shall be installed as shown on the Plans in each gate bay to accept the post. Provide one post and three embedded mounting plate assemblies.

1. Steel Post W16x36, Fy = 50 ksi (ASTM A992 or A572 Grade 50)
2. Base Plate Steel Plate, Fy = 36 ksi (ASTM A36)
3. Embedded Mounting Plate Assembly

a. Steel bars: ASTM A276, stainless steel
b. Steel plate: ASTM A240, stainless steel
c. Steel pipe: ASTM A500, Grade B or C, stainless steel
d. Bolts: Grade 18.8, stainless steel hex head bolts

IV. Fasteners

A. All stop log features, where mounted to concrete surface, shall be fastened with ASTM A193 (Gr. B8) with Type 304 stainless steel nuts and washers. The minimum fasteners diameter shall be taken as 5/8 inch, unless indicated otherwise by the plans, or as recommended by the stop log manufacturer. The minimum embedment into concrete shall be 5 inches, unless noted otherwise on the plans, or as recommended by the anchor system manufacturer.

CONSTRUCTION REQUIREMENTS

A. Drawings showing dimensions and essential details required to fabricate, locate and install the stop log guides shall be submitted for the engineer's approval.

B. The stop log guides shall be installed in accordance with a detailed Installation Manual that shall be furnished by the manufacturer. Extreme care shall be used in the handling, storage, and installation of this equipment to prevent damage or distortion of the equipment and to insure proper performance.

C. Extreme care shall be used in the fabrication, handling, storage and installation of the intermediate post and base plate assembly and the embedded mounting plate assemblies to ensure proper fit and alignment is achieved when the post is installed at each location.

D. Extreme care shall be used when installing the guide slots to ensure that:

1. The correct width guides are attached to the correct walls and to the correct side of the intermediate post if different width guide slots are required,
2. The seals are on the proper side of the guides,
3. All guides are in proper alignment and position to allow insertion of the stop logs when the post is installed on the embedded mounting plate assembly.

E. A stop log recess (pocket) is shown within the concrete walls and floor on the plans for the Gate Structure. Prior to casting of concrete, the Contractor is responsible to verify the required size of this recess (or pocket) with the stop log manufacturer to ensure the recess is sized accordingly to fit required embedments. The pockets shall be filled with nonshrink grout at installation of the embedments in accordance with the manfacturer's recommendations.

OPERATION & MAINTENANCE MANUAL AND PARTS LIST

A. The Contractor shall furnish six (6) copies of a manual containing complete information in connection with the operation, lubrication, adjustment, routine and special maintenance, disassembly, repair, and assembly of all equipment items and accessories described in this Special Provision. Submit to the Engineer.

B. The Contractor shall furnish six (6) copies of the manufacturer's spare parts list and bulletins for each piece of equipment. These lists and bulletins shall clearly show all details and parts, and all parts shall be adequately described and have proper identification marks. Submit to the Engineer.

C. The operation and maintenance manual and parts list shall be bound separately, shall be approximately 8-1/2 inches by 11 inches, printed on good quality paper and bound between flexible, durable covers. Drawings incorporated in the manual and parts list may be folded into the manual to page size. Photographs and catalog cuts of components may be included for identification.

HYDROSTATIC TESTS

A. The following test shall be conducted at each of the three Gate Structure bays: The intermediate post, six Intake Structure Stop Logs and six Lock Stop Logs shall be installed in their anticipated configuration and the Upstream Bulkhead Gates lowered. The stilling basin shall be dewatered, and the Stop Logs and Bulkhead Gates subjected to both a pressure test and leakage test. The Stop Log System shall safely resist a six foot depth of water and the total leakage shall not exceed 0.1 gallons per minute per foot of wetted seal. Testing shall be the responsibility of the Contractor. The test may be witnessed by the Engineer. The Engineer shall be notified at least seven (7) days in advance of equipment tests. The final test report shall be delivered to the Engineer within thirty (30) days of the test.

B. If any deficiencies are revealed during the test, such deficiencies shall be corrected and the tests shall be reconducted until the results are within the specified allowances without additional cost to the State.

METHOD OF MEASUREMENT

STOP LOGS – GATE STRUCTURE will be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for at the contract lump sum price for STOP LOGS – GATE STRUCTURE and shall include all labor, materials, and equipment required to furnish, install, and test the stop log system, including, but not limited to guides, steel post, and grouted embedments.

END OF SPECIAL PROVISION - STOP LOGS – GATE STRUCTURE

STOP LOGS - INTAKE STRUCTURE

DESCRIPTION

This specification relates to the design, materials of construction, fabrication, supply, installation and testing of the aluminum stop log system stop log lifting device, and stop log storage rack for the Lock Intake Structure as shown on the Plans and as specified below. The stop logs shall be manufactured by a Company having a minimum of five (5) years experience in the design and manufacture of equipment of this type.

MATERIAL REQUIREMENTS

I. General

All work will be performed in accordance with the best modern practice for the manufacture of high-grade machinery. All parts will have accurately machined mounting and bearing surfaces so that they can be assembled without fitting, chipping, or remachining. All parts will conform accurately to the design dimensions and will be free of all defects in workmanship or material that will impair their service. The stop log system, frame, and lifting device shall be completely shop assembled to insure proper fit and adjustment of all parts.

A.	Quantity	8 Logs (12 inch height for each log)
B.	Channel width	7 foot Clear Width
	Channel depth	6.5 foot normal channel depth (8 foot design depth)
C.	Depth of water	6.5 foot normal channel depth (8 foot design depth)
D.	Seal one or both directions	One direction (Seal toward Intake Opening/Lock)

II. Design

A. Log

1. The log shall be of one piece extruded aluminum, and shall be extruded with the following characteristics:

   a. Log shall be 12" high.
   b. Minimum tensile strengths shall equal 38,000 psi ultimate and 35,000 psi yield.
   c. The bending stress shall not exceed 9500 psi at the mid-section of the log.
   d. The log shall not deflect more than 1/360 of the span of the log under design head.
   e. The logs shall have lifting lugs that will work with the lifting beam that is to be provided.
   f. The stop logs shall be furnished with UHMW guide bars to eliminate metal-to-metal contact with slots during insertion and removal.
   g. The log surface shall be mill finish.

2. The bottom of the log shall be extruded in a way to accept a specially extruded resilient seal to provide a flush bottom closure. The shape of the seal shall provide a seating surface having a minimum width of 1". The bottom seal and the vertical seals at the ends of the stop logs shall be connected in a way that provides a proper seal at the corners. Adequate drainage shall be provided to allow rapid filling during insertion and rapid drainage during removal of the stop logs. Logs to be of sufficient weight to be submerged under their own weight.

B. Guides

1. The guides shall be of stainless steel, structural shapes or formed plates. The guides shall be designed for maximum rigidity and shall be provided with straps or other approved method on the back of the guides for embedded type to lock it into the concrete. The invert of the frame shall be a stainless steel plate or channel with an approved means of adjusting and anchoring to the base, and shall be welded to the lower ends of the guides to form a seating surface for the resilient seal mounted on the log.

C. Seals

1. Lip type seals shall be securely attached to the sides and bottom of each stop log. Seal shall be formed all around the waterway channel and between each stop log. Indicate orientation (permanent label) on logs which are subjected to flow in only one direction to ensure they are installed in the proper direction upon use.

D. Storage Rack

1. A heavy duty rack for safe and easy storage and access to the stop logs shall be supplied and installed at a location designated by the Engineer. The storage rack shall be designed to store the stop logs in a manner that will not damage the seals or the logs, and will provide easy access for insertion, removal and cleaning (hosing down). The rack shall be designed to store the logs in three or four levels to minimize the required footprint on the ground. Some minor assembly/disassembly to store/remove the upper levels is acceptable since the stop logs may be used infrequently. The rack shall be made of aluminum and the design shall be approved by the Engineer.

E. Hardware

1. All necessary attaching bolts and anchor bolts shall be stainless steel and furnished by the stop log manufacturer.

III. Materials

All materials used in construction of the gates and appurtenances shall be the best suited for the application and shall conform to the following specifications:

A.	Log	Aluminum B308 6061-T6
B.	Lifting Lugs	Aluminum B308 6061-T6 or Type 304 stainless steel

C. Frame — Type 304 Stainless Steel

D. Seals

1) Sides: Lip Seal – ASTM D2000
Grade 2BE 625
Extruded Neoprene
Durometer 60 ± 5

2) Flush Bottom Lip Seal -
ASTM D2000 Grade 2BE 625
Extruded Neoprene
Durometer 60 ± 5

IV. Fasteners

A. All stop log features, where mounted to concrete surface, shall be fastened with ASTM A193 (Gr. B8) with Type 304 stainless steel nuts and washers. The minimum fasteners diameter shall be taken as 5/8 inch, unless indicated otherwise by the plans, or as recommended by the stop log manufacturer. The minimum embedment into concrete shall be 5 inches, unless noted otherwise on the plans, or as recommended by the anchor system manufacturer.

V. Lifting Device

A. One (1) lifting device shall be provided for each stop log width. The lifting device shall be equipped with a suitable eye bolt for crane operation. The device shall be guided by the slot of the guide extrusion, and shall be capable of securing and releasing the stop logs in dry or submerged conditions with the use of a lanyard from the operating floor.

CONSTRUCTION REQUIREMENTS

A. Drawings showing dimensions and essential details required to fabricate, locate and install the stop log system shall be submitted for the Engineer's approval.

B. The stop logs and appurtenances shall be installed in accordance with a detailed Installation Manual that shall be furnished by the manufacturer. Extreme care shall be used in the handling, storage, and installation of this equipment to prevent damage or distortion of the equipment and to insure proper performance.

C. A stop log recess (pocket) is shown within the concrete walls and floor on the plans for the intake structure. Prior to casting of concrete, the Contractor is responsible to verify the required size of this recess (or pocket) with the stop log manufacturer to ensure the recess is sized accordingly to fit required embedments. The pockets shall be filled with nonshrink grout at installation of the embedments in accordance with the manufacturer’s recommendations.

OPERATION & MAINTENANCE MANUAL AND PARTS LIST

A. The Contractor shall furnish six (6) copies of a manual containing complete information in connection with the operation, lubrication, adjustment, routine and special

maintenance, disassembly, repair, and assembly of all equipment items and accessories described in this Special Provision. Submit to the Engineer.

B. The Contractor shall furnish six (6) copies of the manufacturer's spare parts list and bulletins for each piece of equipment. These lists and bulletins shall clearly show all details and parts, and all parts shall be adequately described and have proper identification marks. Submit to the Engineer.

C. The operation and maintenance manual and parts list shall be bound separately, shall be approximately 8-1/2 inches by 11 inches, printed on good quality paper and bound between flexible, durable covers. Drawings incorporated in the manual and parts list may be folded into the manual to page size. Photographs and catalog cuts of components may be included for identification.

HYDROSTATIC TESTS

A. All Stop Logs shall be installed in their anticipated configuration and subjected to both a pressure test and leakage test. The stop log system shall safely resist the maximum design head and shall leak no more than 0.1 gallons per minute per foot of wetted seal. Testing shall be the responsibility of the Contractor. The test may be witnessed by the Engineer. The Engineer shall be notified at least seven (7) days in advance of equipment tests. The final test report shall be delivered to the Engineer within thirty (30) days of the test.

B. If any deficiencies are revealed during the test, such deficiencies shall be corrected and the tests shall be repeated until the results are within the specified allowances without additional cost to the State.

METHOD OF MEASUREMENT

This work will be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for at the contract lump sum price for STOP LOGS - INTAKE STRUCTURE and shall include all labor, materials, and equipment required to furnish, install, and test the stop log system, including, but not limited to, stop logs, guides, grouted embedments, storage rack, and the stop log lifting device.

END OF SPECIAL PROVISION - STOP LOGS - INTAKE STRUCTURE

STOP LOGS – LOCK

DESCRIPTION

This specification relates to the design, materials of construction, fabrication, supply, installation and testing of the aluminum stop log system, stop log lifting device, and stop log storage rack for the Lock as shown on the Plans and as specified below. The stop logs shall be manufactured by a Company having a minimum of five (5) years' experience in the design and manufacture of equipment of this type.

MATERIAL REQUIREMENTS

I. General

All work will be performed in accordance with the best modern practice for the manufacture of high-grade machinery. All parts will have accurately machined mounting and bearing surfaces so that they can be assembled without fitting, chipping, or remachining. All parts will conform accurately to the design dimensions and will be free of all defects in workmanship or material that will impair their service. The stop log system, frame, storage rack, and lifting device shall be completely shop assembled to insure proper fit and adjustment of all parts.

A.	Quantity	22 Logs (12 inch height for each log); 2 frames
B.	Channel width Channel depth	21 foot Clear Width 9.95 foot normal channel depth (11 foot design depth)
C.	Depth of water	9.95 foot normal channel depth (11 foot design depth)
D.	Seal one or both directions	One direction (Seal toward Lock Chamber)

II. Design

A. Log

1. The log shall be of one piece extruded aluminum, and shall be extruded with the following characteristics:

   a. Log shall be 12" high.
   b. Minimum tensile strengths shall equal 38,000 psi ultimate and 35,000 psi yield.
   c. The bending stress shall not exceed 9500 psi at the mid-section of the log.
   d. The log shall not deflect more than 1/360 of the span of the log under design head.
   e. The logs shall have lifting lugs that will work with the lifting beam that is to be provided.
   f. The stop logs shall be furnished with UHMW guide bars to eliminate metal-to-metal contact with slots during insertion and removal.
   g. The log surface shall be mill finished.

2. The bottom of the log shall be extruded in a way to accept a specially extruded resilient seal to provide a flush bottom closure. The shape of the lip seal shall provide a seating surface having a minimum width of 1". The bottom seal and the vertical seals at the ends of the stop logs shall be connected in a way that provides a proper seal at the corners. Adequate drainage shall be provided to allow rapid filling of the stop logs during insertion and rapid drainage during removal. Logs to be of sufficient weight to be submerged under their own weight.

B. Guides

1. The guides shall be of stainless steel, structural shapes or formed plates. The guides shall be designed for maximum rigidity and shall be provided with straps or other approved method on the back of the guides for embedded type to lock it into the concrete. The invert of the frame shall be a stainless steel plate or channel with an approved means of adjusting and locking into the concrete, and shall be welded to the lower ends of the guides to form a seating surface for the resilient seal mounted on the log.

C. Seals

1. Lip type seals shall be securely attached to the sides and bottom of each stop log to restrict leakage. Seal shall be formed all around the waterway channel and between each stop log. Indicate orientation (permanent label) on logs which are subjected to flow in only one direction to ensure they are installed in the proper direction upon use.

D. Storage Rack

1. A heavy duty rack for safe and easy storage and access to the stop logs shall be supplied and installed at a location designated by the Engineer. The storage rack shall be designed to store the stop logs in a manner that will not damage the seals or the logs, and will provide easy access for insertion, removal and cleaning (hosing down). The rack shall be designed to store the logs in three or four levels to minimize the required footprint on the ground. Some minor assembly/disassembly to store/remove the upper levels is acceptable since the stop logs may be used infrequently. The rack shall be made of aluminum and the design shall be approved by the Engineer.

E. Hardware

1. All necessary attaching bolts and anchor bolts shall be stainless steel and furnished by the stop log manufacturer.

III. Materials

All materials used in construction of the gates and appurtenances shall be the best suited for the application and shall conform to the following specifications:

A. Log Aluminum B308 6061-T6

B.	Lifting Lugs	Aluminum B308 6061-T6 or Type 304 stainless steel
C.	Frame	Type 304 Stainless Steel
D.	Storage Rack	Aluminum B308 6061-T6
E.	Seals	1) Sides: Lip Seal – ASTM D2000 Grade 2BE 625 Extruded Neoprene Durometer 60 ± 5
		2) Flush Bottom Lip Seal - ASTM D2000 Grade 2BE 625 Extruded Neoprene Durometer 60 ± 5

IV. Fasteners

A. All stop log features, where mounted to concrete surface, shall be fastened with ASTM A193 (Gr. B8) with Type 304 stainless steel nuts and washers. The minimum fasteners diameter shall be taken as 5/8 inch, unless indicated otherwise by the plans, or as recommended by the stop log manufacturer. The minimum embedment into concrete shall be 5 inches, unless noted otherwise on the plans, or as recommended by the anchor system manufacturer.

V. Lifting Device

A. One (1) lifting device shall be provided for each stop log width. The lifting device shall be equipped with a suitable eye bolt for crane operation. The device shall be guided by the slot of the guide extrusion, and shall be capable of securing and releasing the stop logs in dry or submerged conditions with the use of a lanyard from the operating floor.

CONSTRUCTION REQUIREMENTS

A. Drawings showing dimensions and essential details required to fabricate, locate and install the stop log system and storage rack shall be submitted for the engineer's approval.

B. The stop logs and appurtenances shall be installed in accordance with a detailed Installation Manual that shall be furnished by the manufacturer. Extreme care shall be used in the handling, storage, and installation of this equipment to prevent damage or distortion of the equipment and to insure proper performance.

C. A stop log recess (pocket) is shown within the concrete walls and floor on the plans for the Lock structure. Prior to casting of concrete, the Contractor is responsible to verify the required size of this recess (or pocket) with the stop log manufacturer to ensure the recess is sized accordingly to fit required embedments. The pockets shall be filled with nonshrink grout at installation of the embedments in accordance with the manufacturer’s recommendations.

OPERATION & MAINTENANCE MANUAL AND PARTS LIST

A. The Contractor shall furnish six (6) copies of a manual containing complete information in connection with the operation, lubrication, adjustment, routine and special maintenance, disassembly, repair, and assembly of all equipment items and accessories described in this Special Provision. Submit to the Engineer.

B. The Contractor shall furnish six (6) copies of the manufacturer's spare parts list and bulletins for each piece of equipment. These lists and bulletins shall clearly show all details and parts, and all parts shall be adequately described and have proper identification marks. Submit to the Engineer.

C. The operation and maintenance manual and parts list shall be bound separately, shall be approximately 8-1/2 inches by 11 inches, printed on good quality paper and bound between flexible, durable covers. Drawings incorporated in the manual and parts list may be folded into the manual to page size. Photographs and catalog cuts of components may be included for identification.

HYDROSTATIC TESTS

A. All Stop Logs shall be installed in their anticipated configuration and subjected to both a pressure test and leakage test. The stop log system shall safely resist the maximum design head and shall leak no more than 0.1 gallons per minute per foot of wetted seal. Testing shall be the responsibility of the Contractor. The test may be witnessed by the Engineer. The Engineer shall be notified at least seven (7) days in advance of equipment tests. The final test report shall be delivered to the Engineer within thirty (30) days of the test.

B. If any deficiencies are revealed during the test, such deficiencies shall be corrected and the tests shall be repeated until the results are within the specified allowances without additional cost to the State.

METHOD OF MEASUREMENT

This work will be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for at the contract lump sum price for STOP LOGS - LOCK and shall include all labor, materials, and equipment required to furnish, install, and test the stop log system, including, but not limited to, stop logs, guides, grouted embedments, storage rack, and the stop log lifting device.

END OF SPECIAL PROVISION - STOP LOGS - LOCK

SUMP PUMP

GENERAL

I. Provision Includes:

A. All gravity and forced sump pump discharge piping, hangers, check valves, cutting & patching of surfaces.

B. New sump pump with oil minder monitoring system, control panel, installation, and commissioning.

II. Submittals:

A. Manufacturers product data

1. Control System/Monitoring station
2. Pumps

B. Shop drawings:

1. Control System/Monitoring station
2. Pumps

III. Quality Assurance:

A. Installation shall comply with Illinois Department of Environmental Protection Agency and the requirements of the Illinois Plumbing Code.

B. Contractor shall be qualified and licensed to install pump system and all piping and components shown and required for a complete system.

C. Manufacturers shall regularly be involved with the manufacturing and testing of pump, system and its components.

MATERIAL REQUIREMENTS

I. PACKAGED SUMP PUMP W/ OIL MINDER AND CONTROL STATION

A. Pumps:

1. Submersible type with NEMA 4X weathertight corrosion resistant enclosures.
2. Pump shall be rated for 20 GPM at 25' hd.
3. Motor shall be a 1/6 hp 115V 1 phase.
4. Pump discharge shall be 1" diameter Schedule 40 PVC with check valve as shown on drawings.

B. Controls:

1. Oil monitoring system.

a. Pump and control wiring factory wired into a mountable junction box with a multi-pin quick connect between the junction box and Oil Monitoring control system.

b. Panel shall include LED indicator lights for:

1) Oil spill
2) Power
3) High liquid level
4) Overload
5) Pump run.

c. Panel shall provide audible alarm with silence switch and remote monitoring circuit for:

1) Oil
2) High liquid
3) High amperage

CONSTRUCTION REQUIREMENTS

I. Installation

A. Install pumps, control panel, wiring and piping as shown and detailed on drawings in basin supplied by others.

B. Route 1" Schedule 40 PVC discharge piping as shown on drawings. Discharge outlet shall be turned down with a 45 deg elbow and terminate downstream of stop log slot.

C. Energize pumps and test to verify proper operation of float controls, switches and alarm conditions.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – PLUMBING WORK as shown on the Plumbing Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – PLUMBING WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION – SUMP PUMP

TEMPORARY BOAT TRAFFIC CONTROL AND CHANNEL RESTORATION

DESCRIPTION

The work shall consist of furnishing, installing, testing, adjusting, maintaining, and removing measures to provide temporarily boat traffic control and channel restoration for the lock navigation seasons, as specified on the plans and herein. The Stratton Lock's navigation season is May 1 to October 31 of each year. The lock shall remain in service during the navigation seasons until the project is complete. The Contractor shall provide temporary signage, vessel protection measures and lock operation systems (temporary navigation lights, speakers, cameras, etc.) to allow safe operation of the lock during the navigation season. Design, installation, and maintenance of the systems shall be the responsibility of the Contractor and subject to the approval of the Engineer.

MATERIAL REQUIREMENTS

A. Temporary signage shall be furnished in accordance with the Plans.

B. Temporary navigation lighting and speaker systems shall generally conform, or be similar, to that for the existing lock.

C. A temporary video camera system may be required to assist in navigation control. The temporary camera system may be similar to that specified for the permanent extended lock, or an alternative system accepted by the Engineer.

CONSTRUCTION REQUIREMENTS

I. Submittals

A. The Contractor shall submit a Temporary Boat Traffic Control and Channel Restoration Plan to the Engineer for approval prior to the start of construction. The plan shall indicate key scheduled milestones of lock extension work for various stages of lock construction, subject to acceptance by the Engineer. The plan shall satisfy the requirements on the plans and herein.

II. Boat Traffic Control and Channel Restoration Requirements

A. The Contractor shall be subject to the following work restrictions and requirements during the navigation season:

1. Work within the lock channel, including the existing lock, lock extension, mooring fence, channel dredging, and maintenance dock, shall be prohibited within the navigation season. The Engineer may permit select work activities on a limited basis provided that the disruption of normal traffic is minimized.
2. Work on the lock house and landside site work shall be coordinated with the Lock Master during the navigation season.
3. Contractor may use the lock and lock channel to access other work areas during the navigation season, provided that the disruption of normal traffic is minimized. Contractor will not be given preferential use of the lock. The Department may restrict the Contractor's use of the lock channel during periods of peak use, which usually occurs on weekends and holidays but may occur during other times.

4. At the conclusion of each navigation season, the Department will restrict the public's use of the lock and the Contractor shall be given preferential use of the lock. Use and operation of the lock shall be coordinated with the Lock Master.
5. Prior to each navigation season, the Contractor shall remove all equipment and material from the navigation channel and restore the lock to a navigable condition. Contractor shall rewater the lock channel, remove temporary cofferdams occupying the channel, and construct temporary or permanent guide walls, bumpers, etc. to separate boat traffic from any partially completed work. Contractor shall restore, relocate, and adjust (as necessary), navigation markers, signage, lights, and downstream mooring fence. Contractor shall provide a secure mooring area for the Lock Master's boat at either the current location or an alternate location acceptable to the Lock Master.
6. The Contractor shall complete temporary lock and channel restoration measures a minimum of 10 calendar days prior to the scheduled opening of the navigation season for operational testing and adjustments for use of the lock.
7. Partially constructed portions of the extended lock and channel shall generally be restored to provide safety features, vessel protection, and approach geometry similar to that which currently existing at the lock site. Abrupt edges or terminations of partially constructed features will not be permitted. As a minimum, partially constructed lock walls shall be constructed to be continuous and be integral with wingwalls, providing an approach angle similar to that which currently exists. The approach and lock wall geometry shall be of the same width, depth, and overhead clearance as the existing.
8. Temporary timber bumpers, similar to those that currently exist, shall be provided for the lower monoliths and lock extension walls wherever final bumpers and gates are not installed during any navigation season. Temporary bumpers shall, at a minimum, extend from el. 729.70 (max.) to el. 736.20 (min.).
9. Should lock extension chamber walls be constructed, but new monolith construction not be advanced to the same height, a rigid support system for temporary bumpers shall be designed, installed and maintained by the Contractor and shall be subject to approval of the Engineer. Alternatively, the Contractor may elect to install monolith sheet piling to the top of the extended chamber walls, until the new lower monolith is later constructed.
10. For the condition where partially constructed lock extension features in the downstream approach block view of the approaching boating vessels (such as sheet pile walls or new lock lower monolith), a temporary video camera system will be required to assist in navigation control. The camera system shall provide for viewing of the downstream approach area at a location near the existing lock controls. The temporary camera system may be similar to that for the permanent extended lock, or an alternative system accepted by the Engineer.
11. Temporary navigation lighting and speaker systems shall generally conform, or be similar, to that for the existing lock. The existing lock wall lighting shall be maintained for the existing chamber. Temporary lighting to illuminate the extended lock chamber will be required for the condition where partially constructed lock extension features occupy the downstream approach channel. Such temporary lighting shall provide illumination similar to that of the existing system.
12. The Contractor is responsible to provide and maintain all temporary utilities required to provide lock operation, including, but not limited to, lock operating machinery (gates and valves), lighting, navigation signals, speaker system, and

video camera systems. Utilities shall be provided in a manner accepted by the Engineer.

13. The lock shall be restored to operate with lock cycle times similar to that for normal operation. The Contractor is responsible to stage all lock work in a manner that will satisfy this requirement, including, but not limited to, staging considerations for miter gate work, operating machinery, filling/emptying ports, valves, or other lock components directly impacting operation of the lock.
14. Temporary lock and channel restoration features shall not be installed, modified, or removed without the Engineer's acceptance.

B. The Contractor shall submit a Temporary Boat Traffic Control and Channel Restoration Plan demonstrating the ability to fulfill these requirements for the various stages of lock construction, subject to acceptance by the Engineer. Cost for the above items/tasks shall be included in the Temporary Boat Traffic Control and Channel Restoration pay item.

METHOD OF MEASUREMENT

TEMPORARY BOAT TRAFFIC CONTROL AND CHANNEL RESTORATION shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

TEMPORARY BOAT TRAFFIC CONTROL AND CHANNEL RESTORATION will be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment required to provide temporarily boat traffic control and channel restoration measures, as specified on the plans. Such measures may include, but are not limited to, temporary signage, video camera system, audio system, temporary utilities or utility modifications, alternative piping arrangements, temporary fender (bumper) systems, temporary lighting, mooring fence modifications, and temporary measures to stabilize channel work. Costs to modify, maintain, adjust, test, and remove such temporary measures shall also be included. No separate payment will be made for each navigation season. This item shall include costs for all navigation seasons spanning the project.

END OF SPECIAL PROVISION - TEMPORARY BOAT TRAFFIC CONTROL AND CHANNEL RESTORATION

TEMPORARY AND CONSTRUCTION FENCING

DESCRIPTION

I. This work shall consist of the installation and maintenance of temporary construction fencing and temporary security fencing at the locations shown on the plans and as necessary to control access to the site.

MATERIAL

I. Construction Fence
   a. Construction fence shall be constructed of continuous plastic mesh fencing supported by steel posts driven into the ground or set in precast concrete blocks.
   b. Height shall be 36 inches minimum.
   c. Color shall be safety orange.

II. Temporary Fence
   a. Unless otherwise indicated, the type of temporary fencing shall be the Contractor's option. The following types are acceptable:
      i. New materials or previously used salvaged chain link fence in good condition.
      ii. Posts: Galvanized steel pipe of diameter to provide rigidity. Posts should be suitable for setting in concrete footings, driving into the ground, anchoring with base plates, or inserting in concrete blocks.
      iii. Fabric: Woven galvanized steel wire mesh. Provide in continuous lengths to be wire tied to fence posts or prefabricated into modular pipe-framed fence panels.

III. Temporary Fence Gates
   a. Provide personnel and vehicle gates for functional access to site.
      i. Fabricate of same material as used for fencing.
   b. Vehicle gates:
      i. Minimum width: 20 feet to allow access for emergency vehicles.
      ii. Capable of manual operation by one person.

CONSTRUCTION REQUIREMENTS

A. General
   a. The Contractor shall maintain the fencing in good condition. Any fence section that is damaged shall be repaired immediately.
   b. Holes in pavement shall be surfaced to match existing paving. Repair damage caused by the installation of the temporary and construction fencing.

B. Construction Fence
   a. Construction fence is required around all active work areas including those on the islands.

b. The fence fabric shall be securely attached to posts.
c. Space steel support posts to ensure mesh remains vertical and at the proper height.
d. Securely tie the mesh to the posts.
e. Remove construction fencing upon completion of work.

C. Temporary Fence
a. The Contractor shall install the temporary fencing as noted on the plans and to secure the lock and lock house when the existing security fence is compromised during construction at the lock house.
b. The fence may be individual panels that are free standing and pinned together or a temporary chain link fence with buried posts.
c. Posts shall be spaced at 10 ft maximum.

D. Temporary Gates
a. Provide gates for personnel, delivery of materials, and access by emergency vehicles. Locations shall be confirmed by the Engineer and/or the lockmaster.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

TEMPORARY FENCE shall be measured for payment as a single lump sum item.

CONTSTRUCTION FENCE shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

TEMPORARY FENCE will be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to install and maintain temporary fencing and gates and construction fencing as shown on or specified in the plans and remove them upon completion of the project or at a point where permanent secure fencing is installed and the temporary fencing is not required by the Engineer.

CONSTRUCTION FENCE will be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to install and maintain temporary fencing around all active work areas for the duration of the work and remove them upon completing the project or at a point where construction fencing is not required by the Engineer.

END OF SPECIAL PROVISION – TEMPORARY AND CONSTRUCTION FENCING

TEMPORARY SIGNING

DESCRIPTION

I. This work shall consist of furnishing, installing, maintaining and removing temporary construction signage at the locations identified in the Construction Documents.

MATERIAL

I. Wood or Metal Signs

A. The temporary signing shall be constructed of either ¾ plywood meeting AASHTO M-133, oxboard, or 18 gauge painted steel conforming to Section 1006.29 of the Standard Specifications.

II. Wood Sign Posts

A. Wood sign posts shall be standard 4-in by 4-in by 8-ft untreated dimensional lumber.

III. Hardware

A. Hardware shall conform to Section 1006.29 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS

I. Temporary Construction Sign

A. Temporary construction signs shall be in place prior to any construction operations.

B. Sign panels shall be installed as illustrated in the Construction Documents and in accordance with Section 720.04 of the Standard Specifications.

C. The Contractor shall maintain the signs throughout the length of the Contract. Should the signs degrade and become illegible, the Contractor shall replace them at no additional cost to the Contract.

II. Temporary Construction Sign Removal

A. The temporary construction signs shall be removed by the Contractor once construction is complete and has been accepted by the Engineer.

B. The sign panel, posts, and hardware shall be removed by the Contractor and disposed of in a legal manner.

C. Post holes shall be backfilled with a suitable material. The surface of the filled hole shall be seeded.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

TEMPORARY SIGNING will be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

TEMPORARY SIGNING will be paid for at the contract lump sum price, including, but not limited to, all labor, material s, and equipment required to provide and install temporary signing and removing and disposing of the signing as shown on the plans.

END OF SPECIAL PROVISION – TEMPORARY SIGNING

THERMAL INSULATION

GENERAL

I. This Section includes building insulation that is to be placed on the interior face of the concrete walls at the Gate Structure.

II. SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: Full-size units for each type of exposed insulation indicated.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for insulation products.

D. Research/Evaluation Reports: For foam-plastic insulation.

III. QUALITY ASSURANCE

A. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.

B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency:

1. Surface-Burning Characteristics: ASTM E 84.
2. Fire-Resistance Ratings: ASTM E 119.
3. Combustion Characteristics: ASTM E 136.

IV. DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

MATERIAL REQUIREMENTS

I. MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

B. 1.25 mil embossed white acrylic-coated aluminum sheet on one side and 1.25 mil embossed aluminum on the other Polyisocyanurate Board Insulation: ASTM C 1289,

Type I, Class 2, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, based on tests performed on unfaced core on thicknesses up to 4 in.:

1. Available Manufacturers:

    a. Atlas Roofing Corporation.
    b. Dow Chemical Company.
    c. Rmax, Inc.

II. AUXILIARY INSULATING MATERIALS

A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

III. INSULATION FASTENERS

A. Install with manufacturer’s standard interlock system of foil tapes, and interlocking joint closure systems.

CONSTRUCTION REQUIREMENTS

I. EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance:

1. Proceed with installation only after unsatisfactory conditions have been corrected.

II. PREPARATION

A. Clean substrates of substances harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

III. INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.

IV. INSTALLATION OF GENERAL BUILDING INSULATION

A. Apply insulation units to substrates using the supplier’s standard interlock, complying with manufacturer's written instructions.

V. PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

BASIS OF PAYMENT

Payment for building insulation will be made at the lump sum price for GATE STRUCTURE - INSULATION.

END OF SPECIAL PROVISION – THERMAL INSULATION

TIE RODS

DESCRIPTION

This work shall consist of furnishing and installing threaded steel tie rods, waler connection bolts, couplers, bearing plates, and nuts at locations shown on the plans.

MATERIAL

Tie rods	ASTM A615, Grade 75
Couplers, Nuts	ASTM A615, Grade 75
Bearing Plates	ASTM A36
Waler Connection Bolts and Nuts	ASTM A325 or ASTM A449

Tie rods shall be threaded along their entire length. Couplers and nuts shall develop 125% of the yield strength of the tie rods. Tie rods, couplers, nuts and bearing plates shall be hot dip galvanized according to ASTM A123 or ASTM A153. Waler connection bolts and nuts shall be hot dip or mechanically galvanized according to ASTM A325 or ASTM A449.

CONSTRUCTION REQUIREMENTS

Install tie rods as shown on the plans. Hand-tighten nuts and couplers prior to placing fill above any portion of tie rods. Provide at least one intermediate support near midpoint of tie rod to minimize sag.

METHOD OF MEASUREMENT

Tie rods will be measured for payment as each, including all nuts, couplers, and bearing plates required for installation. Waler connection bolts, nuts and bearing plates will not be measured for payment, but shall be included in the unit price bid for tie rods.

BASIS OF PAYMENT

Tie rods furnished and installed will be paid for at the contract unit price per each for TIE RODS.

END OF SPECIAL PROVISION – TIE RODS

TRANSIENT VOLTAGE SURGE SUPPRESSORS

GENERAL

I. Section Includes: Transient Voltage Surge Suppression (TVSS) devices.

II. System Description

A. Surge suppressors shall be of modular construction with easily replaceable surge suppression components. Units requiring complete replacement of entire unit upon single component failure not acceptable.

B. Provide all new materials, without blemish or defect, in accord with standards specified and U.L. listed or labeled.

III. Quality Assurance

A. Manufacturer: Company specializing in manufacturing of Surge Suppressors with minimum three years documented experience

B. Supplier: Shall be capable of delivering replacement modules to site within 24 hours of notification.

IV. References

A. National Fire Protection Association (NFPA):

1. NFPA 70 – National Electrical Code (NEC).
2. NFPA 101 – Life Safety Code.

B. National Electrical Manufacturers Association (NEMA):

1. 250 – Enclosures for Electrical Equipment

C. Underwriters Laboratories, Inc. (UL):

1. All materials UL listed and labeled.
2. UL 1449

D. State of Illinois:

1. Illinois Steel Products Procurement Act, as amended.

V. Submittals

A. Shop Drawings: Submit dimensional drawing of enclosure, indicating mounting and conduit entry locations.

B. Product Data: Submit manufacturer's product data indicating:

1. Voltage.

2. Phase.
3. Main bus ampacity.
4. integrated short circuit ampere rating.
5. Incoming circuit breaker or fusing requirements.
6. Clamping Voltage.
7. Surge current ratings in all three modes (L-L, L-G, and N-G).

C. Manufacturer's Installation Instructions: Submit manufacturer' installation manual, indicating:

1. Application and storage conditions and limitations.
2. Handling instructions.
3. Protection requirements.
4. Unit installation requirements.
5. Start-up procedures.

D. Operating and Maintenance Data:

1. Submit manufacturer's operating and maintenance manual for each unit.
2. Provide instructions for module replacement.

VI. Delivery, Storage And Handling

A. Materials shall be suitably packaged by manufacturer to prevent damage during shipment. Damaged materials will not acceptable for use.

B. Store materials on site in clean, dry storage area; when outside, elevated above grade and enclosed with durable watertight wrapping.

C. Handle all materials carefully to prevent damage. Minor scratches, marks or blemishes to finish shall be repaired to satisfaction of Architect/Engineer.

MATERIAL REQUIREMENTS

I. Manufacturers

A. Current Technology.

B. Liebert

C. APT

II. Construction

A. Ratings:

1. Surge current handling capacity of the unit shall typically exceed 120,000 Amps per phase for repeated strikes. One-time destructive transient current values are not acceptable.
2. The suppression level after all duty/cycle and life tests shall have peak voltage phase to neutral ratings of:
   a. 400 Volts or less for units protecting 240 or 208 Volt equipment

3. The effective speed and/or response time shall be instantaneous (less than 0.5 ns) with no discernible overshoot for the applied UL test voltage and simultaneous current waveforms.
4. The unit shall incorporate 200,000 AIC time-delay fuses to satisfy both NEC 240-21 and 110-9.

B. General:

1. Unit shall consist of parallel connections only. No series elements will be accepted.
2. Unit shall NOT require disconnection of power to customer equipment for testing and/or maintenance.
3. The primary suppression path shall NOT be to ground.
4. No plug-in or printed circuit board components shall be used in the primary power path.
5. The unit shall not short or crowbar the power flow that would result in an interruption to the load.
6. No scheduled parts replacement or preventive maintenance shall be required.
7. Enclosure shall be NEMA 1, 14 gauge steel, painted inside and out
8. Provided with integral disconnect switch.
9. Unit shall have a built-in safety interlock system to enable testing and maintenance without interruption of the main power flow.
10. Average power consumption shall be less than 0.2 KVA. Average power factor inefficiencies or harmonic distortion shall not result from use. (THD - 0%).
11. Unit shall generate no audible noise while in operation.
12. The power conditioning and transient suppression capability shall be bi-directional, treating both positive and negative impulses, yielding line control and short flicker ride through.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Verify that surfaces are ready to receive work.

B. Install in accordance with manufacturer's instructions.

C. Units shall be compatible with the connected equipment.

D. Units shall be installed immediately adjacent to equipment to be protected.

E. Unit electrical connections shall be made to minimize impedance during surge clearing conditions:

1. Unit shall be effectively grounded.
2. Connecting conductor length shall be kept as short as required to connect equipment while maintaining a neat, workmanlike installation; angular wiring connections prohibited.
3. Installation shall avoid tight bends in connection conductors.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – ELECTRICAL WORK as shown on the Electrical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

2. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – ELECTRICAL WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION TRANSIENT VOLTAGE SURGE SUPPRESSORS

TRASH RACK - INTAKE STRUCTURE

DESCRIPTION

This work shall consist of furnishing and installing the trash rack at the lock intake structure as shown on the plans. The work shall include design, materials of construction, fabrication, and the installation of the HDPE trash rack, connection hardware, trash rack support beam, trash rack support beam brackets, and bracket connection anchors.

MATERIAL REQUIREMENTS

I. General

All work will be performed in accordance with the best modern practice for the manufacturer. All parts shall have accurately machined mounting and bearing surfaces so that they can be assembled without fitting, chipping, or remachining. All parts will conform accurately to the design dimensions and will be free of all defects in workmanship or material that will impair their service. The rack system shall be completely shop assembled to insure proper fit and adjustment of all parts. Manufacturers shall have a minimum of five (5) years experience in the design and manufacture of equipment of this type.

The racks shall be constructed solely of non-metallic materials and will be comprised of a series of vertical bars mounted on multiple horizontal rods. The racks shall resist corrosion, adhesion of frazil and anchor ice, marine growth, and bio fouling while providing a structurally sound rack. The bars shall be radiused on the vertical edges in order to provide a hydrodynamic efficient profile. The bars shall be formed by a continuous molding process extruded from HDPE.

The bar spacing shall be maintained by use of a spacer that fits over the horizontal rod and is accurately sized to provide consistent spacing and is extruded from the same material as the blade. The end of each horizontal rod extends beyond the last blade and is threaded on that portion of the rod only.

The threaded ends of the horizontal rods are fitted with a molded HDPVC hex nut that is tightened to firmly lock the blade and spacer array on the horizontal rods. A stainless steel set screw shall be used to lock the nut to the rod to prevent loosening.

II. Design

The HDPE trash rack shall be designed to resist a minimum of 5 foot of head pressure with no tailwater present. The maximum water velocity through the trash rack system shall be taken as 3 feet per second at a maximum water depth of 7 feet. The trash rack bars shall be spaced to provide a 4 inch clear opening.

III. Blades

The material shall be Extra High Molecular Weight Hexene Copolymer (HXM Polyethylene).

Property	Test Method (ASTM)	Unit	Value
Density	D1505	lbs/ft	59
Tensile Yield Strength	D638	psi	3600
Ultimate Elongation	D638	%	>600
Flexural Modulus	D790	psi	170,000

Material shall be virgin stock. It shall incorporate antioxidants and be resistant to UV radiation and petroleum for at least 30 years. Material shall have excellent stress cracking resistance, rigidity, and impact strength.

IV. Horizontal Rods

The rods shall be 1 ¼" full diameter, pultruded FRP utilizing a vinyl ester (VE) resin system containing UV inhibitors. Rods are threaded on ends only. They shall be full diameter the total length under load.

V. Spacers

The spacer shall be extruded of comparable material to the blades. Precision cut to length to accurately maintain the specified clear spacing between the blades.

VI. Nuts

The nuts shall be of a hex style to facilitate installation on the horizontal rods. The material shall be a high density polyvinyl chloride (HDPVC) and be resistant to water absorption.

VII. Support Beam Connection

Connection of the trash rack to the support beam shall be with 3/8 inch diameter (minimum) galvanized U-bolts with galvanized hardware, or as recommended by the trash rack manufacturer. The connection shall be detailed to allow for unrestricted expansion and contraction of the HDPE rack for temperature variations ranging from -30 to 120 degrees Fahrenheit.

VIII. Trash Rack Top Connection

Connection of the top of the trash rack to the concrete surface shall be with stainless steel mounting brackets (Type 304 or 316) and hardware recommended by the trash rack manufacturer. The minimum thickness of the bracket strap shall be 0.18 inches. The concrete fasteners shall consist of ASTM A193 (Gr. B8) anchor rod with Type 316 stainless steel nuts and washers. The minimum fasteners diameter shall be taken as 1/2 inch, unless indicated otherwise by the plans, or as recommended by the manufacturer. The minimum embedment into concrete shall be 8 inches, unless noted otherwise on the plans, or as recommended by the adhesive anchor system manufacturer to fully develop of anchor rod in tension. The connection shall be detailed to allow for unrestricted expansion and contraction of the HDPE rack for temperature variations ranging from -30 to 120 degrees Fahrenheit.

IX. Trash Rack Support Beam and Brackets

Materials, fabrication, and installation of the trash rake support beam and support beam brackets shall generally conform to the requirements of Section 505 of the IDOT Standard Specifications for Road and Bridge Construction and shall be galvanized after fabrication. The support beam shall be ASTM A992 Steel and the brackets shall be ASTM A36. The brackets shall be mounted to concrete surface of the lock intake structure, at the location shown on the plans, and shall be fastened with ASTM F1554 (Gr. 36) galvanized anchor rod with galvanized steel nuts and washers. The minimum embedment into concrete shall be 12 inches, unless noted otherwise on the plans. Connect the support beam to the brackets with galvanized ASTM A325 bolts.

X. Warranty

A 12 month manufacturer warranty for the HDPE trash rack system shall guarantee that the trash rack to be free from defects in material and workmanship under normal use and maintenance. The manufacturer shall correct any defect in material or workmanship without charge for parts or labor for a period of eighteen from the date of final project completion.

CONSTRUCTION REQUIREMENTS

Drawings showing dimensions, connection details, and rack manufacturer's data shall be submitted for the engineer's approval.

The trash rack and appurtenances shall be installed in accordance with the Installation Manual furnished by the manufacturer. Extreme care should be used in the handling, storage, and installation of the rack to prevent damage or distortion of the rack and to insure proper performance.

Chamfer top edge of bars at top to rack system.

Upon final alignment and adjustment of the trash rack and support beam system, install approved non-shirk grout between the bracket plate and intake structure wall.

METHOD OF MEASUREMENT

This work shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for at the contract lump sum price for TRASH RACK – INTAKE STRUCTURE and shall include all labor, materials, and equipment required to furnish and install the trash rack system, including, but not limited to, trash rack, mounting brackets (wall and beam), mounting bracket anchors, steel support beam, steel support beam brackets, and steel support beam bracket anchors.

END OF SPECIAL PROVISION - TRASH RACK - INTAKE STRUCTURE

TRENCH EXCAVATION AND BACKFILL

DESCRIPTION

I. This work shall consist of excavation and backfill associated with the installation of piping at the lock and gate structures.

MATERIAL

I. Controlled Low Strength Material

A. Controlled low strength material (CLSM) shall meet the requirements of Section 593 of the Standard Specifications. Mix 2 shall be used.

II. Porous Granular Embankment

A. Porous granular embankment (PGE) shall meet the requirements of Section 207 of the standard specifications. PGE shall meet the gradation of CA-18.

III. Earth Backfill

A. Earth backfill where indicated shall consist of cohesive materials with 30 percent or more passing the No. 200 sieve, and having a plasticity index (PI) between 3 and 35. Materials having a more than 85 percent smaller than 0.05 mm shall not be used.

CONSTRUCTION REQUIREMENTS

I. Due to some of the trench excavations being located within the dam section, trench excavations shall be coordinated with the requirements of the Cofferdam special provision.

II. Excavation:

A. If the excavated material meets the requirements of the backfill material, it shall be set aside and used for backfill.

B. In areas where PGE is required, the excavated material shall be removed and either used elsewhere on the project or removed by the contractor.

C. If the material is unsuitable, it shall be removed and disposed of by the contractor.

III. Backfill:

A. A bedding of CLSM Mix 2 shall be placed and the pipe set at the proper grade. The CLSM shall be placed in a staggered pours to prevent floatation of the pipe. The bedding and haunching shall occur over a minimum of two pours with the CLSM curing between pours. The second pour shall fill in any cracks or gaps caused by shrinkage around the pipe.

B. The trench shall be backfilled from the springline to the finished surface using earth backfill in 6-9 inch lifts compacted to 98% standard proctor.

C. Where PGE is required for backfill, it shall be used in lieu of the earth backfill.

METHOD OF MEASUREMENT

Trench excavation and backfill will not be measured for payment.

BASIS OF PAYMENT

Trench excavation and backfill will not be paid for directly but shall be considered included in the various HDPE Pipe items, with the trench excavation and backfill construction included in the unit prices for these items.

END OF SPECIAL PROVISION – TRENCH EXCAVATION AND BACKFILL

VARIABLE FREQUENCY DRIVES

GENERAL

I. Section Includes:

A. VFD's specified and shown on drawings.

B. Control Devices.

C. Custom fabricated control panels.

II. Sequence Of Operation

A. Lock Gate Operator and Fill/Empty Gate Operator VFD's:

1. VFD's are to be utilized for:

a. Conversion of single phase power to three phase power to motors.
b. Reversing operation of motors.

2. Speed of all VFD's shall be set at 100% (Full Speed Operation).
3. Control of VFD's shall be through Lock Control System PLC:

a. PLC shall start and stop VFD.
b. PLC shall control forward or reverse operation of motor.

4. See Control Loop Descriptions special provision for description of Lock Control System sequence of operation.

B. New Gate Structure Bypass Gate Operators:

1. VFD's are to be utilized for:

a. Conversion of single phase power to three phase power to motors.
b. Reversing operation of motors.

2. Speed of all VFD's shall be set at 100% (Full Speed Operation).
3. Three position Local-Off-Computer selector switch shall be provided on cover of VFD for operational control of VFD:

a. Local Position: VFD shall be operated from pushbuttons located on cover of VFD.
b. Off Position: VFD shall not be operable.
c. Computer Position: VFD shall be operated from Dam Control System PLC:

1) PLC shall start and stop VFD.
2) PLC shall control forward or reverse operation of motor.

4. Momentary contact pushbuttons shall be provided on the cover of the VFD, functional only when VFD Local-Off-Computer selector switch is in Local position:

    a. Open Pushbutton: Shall cause VFD to operate in Forward (Open) mode continuously while pushbutton is depressed.
    b. Close Pushbutton: Shall cause VFD to operate in Reverse (Close) mode continuously while pushbutton is depressed.
    c. Release of either pushbutton shall cause the VFD to stop. VFD operation shall not latch on in either direction.

5. See Control Loop Descriptions special provision for description of Dam Control System sequence of operation.

III. Quality Assurance

A. Manufacturer: Company specializing in manufacturing of Variable Frequency Controllers with minimum three years documented experience

B. Supplier: Shall have a full service facility within two hours of project site.

C. Control Panel Fabricator:

1. Custom control panels shall be furnished from a panel shop regularly engaged in the fabrication of control panels.
2. The panel shop facility shall be UL recognized. Documentation of UL recognition must be provided prior to approval.
3. The panel shop shall be able to demonstrate with installations of similar size and complexity their ability to perform the work as specified.
4. The following panels and associated equipment are to be provided by this panel shop:

    a. LCP-U
    b. LCP-C
    c. LCP-D
    d. LRP-U
    e. LRP-C
    f. LRP-I
    g. LRP-D

IV. References.

A. National Electrical Manufacturers Association (NEMA):

1. NEMA MG-1.
2. NEMA MG-13.
3. NEMA 250

B. National Fire Protection Association (NFPA):

1. NFPA 70 - National Electrical Code (NEC).

C. Underwriters Laboratories, Inc. (UL):

1. All products UL Listed and labeled.

D. State of Illinois:

1. Illinois Steel Products Procurement Act, as amended.

V. Submittals

A. Shop Drawings:

1. Provide scaled drawings for each piece of equipment including:

a. Enclosures, including both front and side views with overall dimensions and weights noted.
b. Conduit entrance locations and requirements shall be called out on drawings.
c. Cooling air requirements and clearances to other equipment.
d. All accessory equipment provided in separate enclosures from drive.

2. Provide wiring diagrams for each piece of equipment:

a. Wiring diagrams must be prepared specifically for this job, showing connections to all control devices and external connections to field devices.
b. **Manufacturer's standard generic wiring diagrams are not acceptable and will be rejected.**

B. Product data: Provide manufacturer's product data indicating:

1. Input and output Voltage
2. Continuous current rating
3. Ratings of switching and overcurrent protective devices.
4. Short circuit ratings.
5. Overload capabilities.
6. Heat generation under full load and cooling air requirements.
7. Ambient environment requirements.
8. All accessory components to be provided with units.

C. Installation Instructions: Submit manufacturer's published installation instructions:

1. Provide separate set of instructions for each class or series of equipment to be supplied.
2. Shall indicate application conditions and limitations of use stipulated by the product's listing or standards testing requirements.
3. Include instructions for storage, handling, and protection of equipment prior to installation.

4. Should include full installation instructions for equipment, including drive start-up, testing, programming, and troubleshooting.
5. Instructions for connected of three phase drive input to single phase supply shall be included.

D. Start-up and Test Reports: Indicate field test and inspection procedures and test results.

E Operation And Maintenance Data:

1. Operation Data:

   a. Instructions for starting and operating units.
   b. Operating limits that may result in hazardous or unsafe conditions.

2. Maintenance Data:

   a. Submit manufacturer's maintenance manual for each starter.
   b. Maintenance manuals shall include parts list and troubleshooting guide.

   c. Include routine preventive maintenance schedule.

3. Include copy of approved submittal wiring diagrams in O & M Manual.

VI. Delivery, Storage, And Handling

A. Materials shall be suitably packaged by manufacturer to prevent damage during shipment. Damaged materials will not acceptable for use.

B. Store materials on site in clean, dry storage area:

1. Do not store materials outside.
2. Store electronic components in conditioned space that does not exceed manufacturer's published storage requirements.
3. Maintain original factory packaging until installation.

C. Handle all materials carefully in accordance with manufacturer's written instructions to prevent damage:

1. Lift only with lugs provided for the purpose.
2. Handle carefully to avoid damage to components, enclosure, and finish.
3. Minor scratches, marks or blemishes to finish shall be repaired to satisfaction of Engineer.

VII. Warranties And Bonds

A. Manufacturer's warranty: Two years on Variable Frequency Controller and all supplied components, including all control components.
B. Contractor's warranty: Two years on all supplied components.

MATERIAL REQUIREMENTS

I. Acceptable Manufacturers

A. Allen Bradley

B. Cutler Hammer

C. General Electric

D. Square D

E. Toshiba

II. Design

A. Variable torque, pulse width modulated inverter system.

B. Switching power supply operating off DC link.

C. Microprocessor based inverter logic controller:

1. Controller shall be isolated from power circuits.
2. Subjecting the controller to any of the following conditions shall not result in component failure or the need to fuse replacement:

a. Short circuit at controller output.
b. Ground fault at controller output.
c. Open circuit at controller output.
d. Input undervoltage.
e. DC bus overvoltage.
f. Loss of input phase.
g. AC line switching transients.
h. Instantaneous overload.
i. Sustained overload exceeding 100 % of controller rated current.
j. Overtemperature.

D. Provided with input disconnect switch as recommended by the manufacturer.

E. Provided with current limiting fuses on the VFD input.

F. Shall be capable of automatically restarting the connected load after power failure to drive.

1. All necessary time delays, control circuits, programming, etc., needed to accomplish this shall be factory installed.
2. Drive shall restart to same operating condition and settings at time of power failure without the need to manually reset the unit.

G. VFD output carrier frequency shall be adjustable from between 1kHz through 10kHz minimum. Full nameplate output current shall be available throughout this adjustment range.

III. Ratings

A. Input Voltage: 240 Volts, Single Phase, 60 Hertz. Input Voltage tolerance between +10% to –5%.

1. Manufacturer shall size VFD as required to operate connected three phase motors from single phase input.

B. Motor Nameplate Voltage: 208 Volts, 3 Phase.

C. Displacement Power Factor: Greater than 0.95 lagging over entire operating speed and load range.

D. Ambient Temperature Range: From 0^{o}C to 40^{o}C while under maximum load.

E. Supplied unit shall be capable of continuous operation at maximum load at an altitude of 1000 feet above sea level.

F. Fault withstand capability of 65,000 RMS Symmetrical amperes.

G. Shall be capable of supplying 150% of rated full load current for one minute at maximum ambient temperature.

IV. Features

A. Provide integral digital display capable of indicating:

1. Output Voltage.
2. Output Frequency, both absolute and as a percentage.
3. Output Current.
4. Output Power.
5. Output Power Factor.
5. DC Bus Voltage.
6. Unit Operating Temperature.

B. The VFD electronics shall monitor and indicate the following conditions:

1. Undervoltage.
2. Overvoltage.
3. Overtemperature.
4. Overcurrent.
5. Ground Fault.
6. Bus Power Undervoltage.
7. Drive Fault.

C. Provide the ability to adjust the following settings over the listed ranges:

1. Volts/Hertz: +/- 10%.
2. Current limit: 60% to 120% of rated output current.
3. Minimum frequency: 3 Hertz to 54 Hertz.
4. Maximum frequency: 40 Hertz to 72 Hertz.
5. Acceleration Time: 6 to 60 seconds.
6. Acceleration Rate: 0.5 to 30 seconds.

7. Deceleration Time: 6 to 60 seconds.
8. Deceleration Rate: 1 to 30 seconds.

D. The VFD shall be capable of producing an output frequency over the range of 3 to 72 Hertz:

1. VFD shall produce full output frequency range without low speed cogging.
2. Over frequency protection shall be included such that a failure in the controller electronic circuitry shall not cause frequency to exceed 110% of the maximum output frequency.
3. Controller shall be capable of excluding certain frequency ranges from use.

a. Blocked frequency settings shall be field adjustable.
b. Drive shall accelerate or decelerate through blocked frequency ranges at the set rates.
c. Automatic speed controls on the drive shall compensate for blocked frequency ranges in their control logic to prevent drive from operating continuously at a blocked frequency.

E. Solid state motor overload protection shall be provided for VFD output:

1. Whenever load current exceeds an adjustable threshold, a 60 second timing circuit shall be activated.
2. Should current remain above the threshold continuously for the timing period, the controller will automatically shut down.
3. The timing circuit shall include a memory such that current exceeding the threshold for less than 60 seconds and dropping back below the threshold momentarily shall not cause the timer to reset to zero; instead the timing circuit shall pick up at a point dependent upon the length of the time the current was below the threshold.

F. Provided with the following standard inputs and outputs:

1. Start input to start the VFD upon the closure of a contact or switch across the input terminals.
2. Safety input to prevent the VFD from starting unless contact is closed between the two input terminals.
3. Speed control input for connection of a manual speed potentiometer.
4. Fault output consisting of a Form C contact that activates upon and VFD fault condition.

V. Accessories

A. Input Line Reactor:

1. Provide input line reactors for all VFD's.
2. Minimum 3% reactance.
3. Reactors shall be provided by VFD manufacturer with the VFD package.

VI. Enclosure

A. Provide NEMA 1 enclosure for indoor dry locations.

1. NEMA 1 enclosures shall be constructed of UL 98 code gauge sheet steel.
2. Provide manufacturer's standard finish on all enclosures.

B. Provide open construction for VFD's to be located in side separate control enclosures.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Enclosures shall be rigidly mounted and secured. Support by conduit shall not be permitted.

B. Individual VFD's shall be mounted with their tops no more than 60 inches above finished floor unless otherwise noted on drawings.

C. Wiring shall be neatly bundled and tied after complete installation.

D. Provide all control and interlock wiring shown on the drawings.

E. Conduit and wire shall be installed in accordance with NEC and Division 16 of this Manual.

F. Coordinate with exact requirements as called out on shop drawings of all equipment.

G. Liquidtight Flexible (LT FLEX) conduits shall be used for all connections to motors.

H. Do not install VFD's until building environment can be maintained within the storage conditions required by the manufacturer.

II. Identification

A. VFD's shall be identified as to device and use via an engraved laminated nameplate. See Electrical Identification special provision for requirements.

B. Motor nameplates shall be checked for full load current rating and allowable temperature rise to determine correct overload relay settings each motor.

III. Field Quality Control

A. Inspect completed installation for:

1. Physical damage.
2. Proper alignment.
3. Secure anchorage.
4. Proper grounding.

B. Tighten accessible connections and mechanical fasteners before operation.

C. Make final adjustments to VFD to assure proper operation of fan system.

D. Touch up scratched or marred surfaces to match original finish.

IV. Operation And Test

A. Contractor shall test and verify correct phasing and rotation of motors. Contractor shall perform corrective phasing work as required.

B. With equipment operating under normal load the Contractor shall measure and record motor voltage and amperage for each phase.

1. Verify that measurements are within nameplate ratings.
2. Record complete nameplate data for each motor and record measured voltage and amperage readings for each motor.
3. List thermal overload element or overload relay settings for each motor.
4. Submit data in tabular form for review by Engineer. Include copy of test results in Operational and Maintenance Manual.

C. Component Testing:

1. Prior to scheduled component test, Contractor shall confirm operation of all equipment.
2. VFD manufacturer's field service technician shall visit site and perform required VFD commissioning prior to scheduling the component test.
3. VFD's and connected equipment shall be operated under actual load conditions.
4. All VFD controls shall be operated and verified against the descriptions in the Sequence of Operation.

    a. Discrepancies between actual operation and the Sequence of Operation shall be corrected.
    b. All required modifications to the controls as required to achieve the specified Sequence of Operation shall be completed prior to scheduling the Component Test.

5. Written confirmation from VFD manufacturer's representative shall be presented to the Engineer that the installation is complete and all VFD's are operational per the Sequence of Operation prior to Engineer scheduling Component Testing.
6. VFD manufacturer's field service technician shall present at the site during the Component Test to assist in the operation of the equipment.
7. After the component test, contractor's personnel shall receive operational training of the equipment.

E. System Testing:

1. Entire installation shall be completed prior to the scheduled System Test.
2. Prior to scheduled system test, Contractor shall confirm operation of all equipment and controls against the descriptions in the Sequence of Operation.

    a. Discrepancies between actual operation and the Sequence of Operation shall be corrected.
    b. All required modifications to the controls as required to achieve the specified Sequence of Operation shall be completed prior to scheduling the System Test.

3. Contractor's personnel trained in the operation of the equipment shall present at the site during the System Test to operate the equipment.

V. Training

A. After successful completion of the System Test, provide training of the Department's personnel.

B. Training of the Department's personnel shall be performed jointly by the Contractor and the VFD manufacturer's field service technician.

1. VFD manufacturer's field service technician shall provide training on the VFD and VFD mounted controls.
2. Contractor shall provide training for all other controls and systems.

C. Provide for two (2) training sessions, minimum of four (4) hours each.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. DAM CONTROL SYSTEM as shown on the Electrical Drawings in the Algonquin Gate Control Plans Volume shall be measured for payment as a single lump sum item.

2. GATE STRUCTURE – ELECTRICAL WORK as shown on the Electrical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

3. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. DAM CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. GATE STRUCTURE – ELECTRICAL WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

3. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION VARIABLE FREQUENCY DRIVES

WARNING CABLE AND MOUNTING SYSTEM

DESCRIPTION

This work shall consist of furnishing and installing a warning cable, mounting hardware, anchor posts and tensioning device across the channel upstream of the new gate system. This work shall also include the removal and disposal of the old warning cable and mounting system.

MATERIAL

I. Plastic Covered Wire Cable

A. Cable shall be 5/16-in diameter Permaflex cable or equal. It shall consist of a 1/4-in diameter 7X7 galvanized steel wire rope coated and impregnated with a yellow polypropylene plastic. The cable shall have a breaking strength of 6,100 lbs.

II. Steel Pipe

A. Steel pipe shall conform to ASTM A53 for Standard Pipe.

B. The pipe shall be galvanized.

III. Concrete

A. Concrete for the footings shall be Class SI Concrete conforming to Section 1020 of the Standard Specifications.

IV. Hand Winch

A. Hand winch shall be an electro galvanized hand operated ratcheting winch with a galvanized steel cable. The winch shall have an operating capacity of 2000 lbs.

V. Hardware

A. Cable thimbles, cable clamps, washers, lock washers, nuts, and threaded rod shall be electro galvanized. Hardware shall conform to Section 1094.04 of the Standard Specifications.

VI. Warning Signs

A. The warning signs and sign hardware are specified in the "Signs" special provision.

CONSTRUCTION REQUIREMENTS

I. General

A. The warning cable system shall be placed in service prior to the existing cable being removed.

B. The Contractor shall coordinate with the Engineer prior to removing the cable for construction operations.

II. Cable Anchor Pipe and Connection

A. Contractor shall dig the foundation and cast the 4-in diameter cable anchor pipe in the center with Class SI concrete for the east and west anchorages.

B. The 4-in pipe shall be held 4 inches above the bottom of the bottom of the foundation.

C. The Contractor shall slope the top of the concrete away from the pipe to drain water.

D. On the west side of the anchorage, the Contractor shall drill a 5/8" diameter hole through the cable anchor pipe 3-inches below the top of the pipe in line with the opposite anchorage.

E. The cable shall be attached using a ½" diameter eye bolt and a threaded galvanized quick link. The cable shall have a cable thimble and two cable clamps.

III. Winch Connection Detail

A. On the east anchorage, the contractor shall weld a 3/8" thick steel plate to the top of the cable anchor pipe. The pipe shall be cut at a 30 degree angle with the cut aligned with the opposite anchorage.

B. The hand winch shall be bolted to the steel plate using the bolts and bolt pattern required by the winch manufacturer.

C. The winch shall have a clasp for attaching it to the cable. Point of connection to the plastic coated wire cable shall be adjusted to allow for the raising and lowering of the cable from a low water condition to a high water condition, keeping the cable out of the water. Cable position shall be coordinated with the lockmaster.

IV. Removal of the Existing Cable and Mounting System

A. The Contractor shall remove the existing cable and anchorages after the new cable system is in place.

B. The cable and anchorages shall be disposed of by the Contractor in a legal manner.

METHOD OF MEASUREMENT

This work will be measured for payment as indicated for the items noted below:

WARNING CABLE AND MOUNTING SYSTEM shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

This work will be paid for as indicated for the various items noted below:

WARNING CABLE AND MOUNTING SYSTEM will be paid for at the contract lump sum price, including, but not limited to, all labor, materials, and equipment required to furnish and

install the warning cable system, mounting posts, post foundations and hardware as shown on the plans and to remove and dispose of the existing cable and mounting posts in their entirety.

END OF SPECIAL PROVISION – WARNING CABLE AND MOUNTING SYSTEM

WATER REPELLENTS

GENERAL

I. This Section includes penetrating water-repellent coatings for vertical and horizontal surfaces for unpainted Concrete.

II. PERFORMANCE REQUIREMENTS

A. Absorption: Minimum 80 percent reduction of absorption after twenty-four (24) hours in comparison of treated and untreated specimens:

1. Hardened Concrete: ASTMC642.

B. Water-Vapor Transmission: Maximum 10 percent reduction in rate of vapor transmission in comparison of treated and untreated specimens, per ASTM E 96.

C. Permeability: Minimum 80 percent water-vapor transmission in comparison of treated and untreated specimens, per ASTM D 1653.

D. Water Penetration and Leakage through Masonry: Maximum 90 percent reduction in leakage rate in comparison of treated and untreated specimens, per ASTM E 514.

E. Durability: Maximum 5 percent loss of water repellency after 2500 hours of weathering in comparison to specimens before weathering, per ASTM G 154.

III. SUBMITTALS

A. Product Data: For each type of product indicated:

1. Include manufacturer's printed statement of VOC content.
2. Include manufacturer's standard colors.

B. Qualification Data: For Installer.

C. Warranty: Special warranty specified in this Section.

IV. QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

V. PROJECT CONDITIONS

A. Limitations: Proceed with application only when the following existing and forecasted weather and substrate conditions permit water repellents to be applied according to manufacturers' written instructions and warranty requirements:

1. Ambient temperature is above 40°F.
2. Concrete surfaces and mortar have cured for more than twenty-eight (28) days.
3. Concrete or brick masonry walls are not treated prior to thirty (30) days after building close-in.

4. Rain or snow is not predicted within twenty-four (24) hours.
5. Application proceeds more than twenty-four (24) hours after surfaces have been wet.
6. Substrate is not frozen, or surface temperature is above 40°F.
7. Windy conditions do not exist that may cause water repellent to be blown onto vegetation or surfaces not intended to be treated.

VI. WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer and Applicator agree(s) to repair or replace materials that fail to maintain water repellency specified in Part 1 "Performance Requirements" Article within specified warranty period:

1. Warranty Period: Five (5) years from date of Substantial Completion.

MATRERIAL REQUIREMENTS

I. MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one (1) of the products listed in part VIII

II. PENETRATING WATER REPELLENTS

A. Siloxane, Penetrating Water Repellent: Clear, oligomerous alkylalkoxysiloxanes containing 10 percent or more solids; with alcohol, ethanol, mineral spirits, water, or other proprietary solvent carrier; and with 3.3 lb/gal. or less of VOCs:

1. Available Products:

a. Chemprobe Coating Systems, L. P.; Prime A Pell H_2O.
b. Euclid Chemical Company (The); Weatherguard.
c. Hydrozo, a division of ChemRex; Enviroseal 40.
d. ProSoCo, Inc.; Siloxane WB Concentrate.

CONSTRUCTION REQUIREMENTS

I. PREPARATION

A. Clean substrate of substances that might interfere with penetration or performance of water repellents. Test for moisture content, according to water-repellent manufacturer's written instructions, to ensure that surface is dry enough:

1. Cast-in-Place Concrete: remove oil, curing compounds, laitance, and other substances that could prevent adhesion or penetration of water repellants.

B. Test for pH level, according to water-repellent manufacturer's written instructions, to ensure chemical bond to silicate minerals.

C. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of water repellent. Cover adjoining and nearby surfaces of aluminum and glass if there is

the possibility of water repellent being deposited on surfaces. Cover live plants and grass.

D. Coordination with Sealants: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured:

1. Water-repellent work may precede sealant application only if sealant adhesion and compatibility have been tested and verified using substrate, water repellent, and sealant materials identical to those used in the work.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

II. APPLICATION

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect the substrate before application of water repellent and to instruct Applicator on the product and application method to be used.

B. Apply a heavy-saturation spray coating of water repellent on surfaces indicated for treatment using low-pressure spray equipment. Comply with manufacturer's written instructions for using airless spraying procedure, unless otherwise indicated.

C. Apply a second saturation spray coating, repeating first application. Comply with manufacturer's written instructions for limitations on drying time between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if written instructions are not applicable to Project conditions.

III. CLEANING

A. Immediately clean water repellent from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Repair damage caused by water-repellent application. Comply with manufacturer's written cleaning instructions.

METHOD OF MEASUREMENT

BASIS OF PAYMENT

The work described in this special provision will not be paid for as a separate item, but shall be included in the bid price for Concrete Structures.

END OF SPECIAL PROVISION – WATER REPELLENTS

WIRING DEVICES

GENERAL

I. Section Includes:

A. Wiring Devices.

B. Coverplates.

II. References.

A. National Electrical Manufacturers Association (NEMA):

1. WD-1 - General Purpose Wiring Devices.
2. WD-2 - Semi-Conductor Dimmers for Incandescent Lamps.
3. WD-5 - Specific Purpose Wiring Devices.

B. National Fire Protection Association (NFPA):

1. NFPA 70 - National Electrical Code (NEC).

C. Underwriters Laboratories, Inc. (UL):

1. All materials UL listed and labeled.

D. State of Illinois:

1. Illinois Steel Products Procurement Act, as amended.

III. Submittals

A. Product Data: Submit manufacturer's product data for all wiring devices.

IV. Delivery, Storage And Handling

A. Materials shall be suitably packaged by manufacturer to prevent damage during shipment. Damaged materials will not be acceptable for use.

B. Store materials on site in clean, dry storage area.

C. Handle all materials carefully to preclude damage during installation.

D. Store electronic devices in protected space. Do not exceed manufacturer's storage temperature requirements.

MATERIAL REQUIREMENTS

I. Wiring Devices

A. General:

1. All wiring devices shall be by the same manufacturer.
2. UL listed.
3. Specification grade.
4. Have a one-piece mounting strap with integral ground contacts.
5. Provided with a green hexagonal head screw grounding terminal.
6. Constructed with both back and side wire provision for two wires per terminal.
7. All devices shall be Ivory color unless noted otherwise.

B. Switches

1. Comply with FS WC-896-E.
2. 120/277V rated, 20A or 30Aas required for connected load.
3. Capable of being used at full rated capacity on tungsten filament, fluorescent and HID loads.
4. Capable of being used on motor loads up to 80% of switch rating.
5. Provided with silver alloy contacts.
6. Acceptable products: SPST, 2-Pole, 3-Way, and 4-Way, 20A, 125/277V, toggle type:

a.	Hubbell	HBL122 (1,2,3,4)
b.	Leviton	122 (1,2,3,4)
c.	Pass & Seymour	20AC (1,2,3,4)

C. Receptacles:

1. Comply with FS/UL WC-596-E, UL 498, NEMA WD-1 Heavy Duty Standards.
2. Face of device shall be a thermoplastic or thermo-set material.
3. Acceptable products: Duplex 20A, 125V, NEMA 5-20R:

a.	Hubbell	HBL5362
b.	Leviton	5362A
c.	Pass & Seymour	5362A

4. Ground Fault Circuit Interrupter (GFCI) Receptacles: In addition to the requirements for receptacles listed above, GFCI receptacles shall also conform to the following:

   a. Have an automatic trip device and a sensing and test circuit.
   b. Device shall trip within 7 seconds with an applied leakage of 4 to 6 mA.
   c. Device shall not trip within 10 seconds with a leakage or less than 4 mA.
   d. UL 943.
   e. Be capable of providing ground fault protection for downstream connected devices.
   f. Duplex type, 20A, 125V, NEMA 5-20R.
   g. Acceptable Products:

1)	Hubbell	HBLGFTR20
2)	Leviton	8899-G

3) Pass & Seymour 2091-S

II. Coverplates

A. Interior Coverplates:

1. Finished Spaces:

a. Smooth Styling.
b. 0.04 inch thick #302 Satin finish stainless steel.
c. Conform to NEMA and ANSI Standards.
d. Meet Federal Specification WP-455a.
e. UL listed.
f. Same manufacturer as wiring devices.

2. Unfinished Spaces:

a. For recessed mounted device boxes, provide stainless steel coverplates same as for finished spaces.
b. For surface mounted device boxes provide galvanized raised device covers – see Section 16050.

B. Exterior and Wet Location Coverplates:

1. Switches:

a. UL Listed for wet locations.
b. Constructed of die-cast zinc.
c. Provided with external switch operating lever to activate switch without opening a cover. Spring-loaded receptacle style coverplates not acceptable.
d. Suitable for horizontal or vertical mounting.
e. Stainless steel mounting screws and weather-resistant gasketing.

2. Weatherproof Receptacle Covers:

a. UL Listed for wet locations only with cover closed and not in use.
b. Constructed of die-cast zinc.
c. Provided with single spring-loaded cover that snaps closed when device not in use.
d. Horizontal or vertical mounting as required for installed receptacle. Cover shall open upwards when installed on device box.
e. Stainless steel mounting screws and weather-resistant gasketing.
f. Provided with GFCI style receptacle opening.

3. Weatherproof While-In-Use Covers:

a. UL Listed for wet locations with plug connected and cover closed in compliance with NEC 406.8.
b. Constructed of die-cast aluminum.

c. Horizontal or vertical mounting as required for installed receptacle. Cover shall open upwards when installed on device box.
d. Self-closing hinged metal cover. Plastic covers not acceptable.
e. Extra-deep type.
f. Stainless steel mounting screws and weather-resistant gasketing.
g. Provided with GFCI style receptacle opening.

CONSTRUCTION REQUIREMENTS

I. Installation

A. Execute work in a manner not to interfere with Department's operation.

B. Coordinate regarding location and size of pipes, raceways, ducts, openings, switches, outlets, so there is no interference between installation or progress of work.

C. Install all equipment with ample space allowed for removal, repair, or changes to equipment.

1. Provide ready accessibility to removable parts of equipment and to all wiring without moving equipment installed or already in place.
2. Provide access panels for all devices installed above non-accessible ceilings or within walls or partitions.

D. Coordinate installation of outlet boxes with other equipment:

1. In mechanical and electrical equipment spaces, expose ceiling outlets with due consideration to ventilating ducts and mechanical piping.
2. Where numerous ducts occur, install outlets after installation of ductwork complete.
3. Puncturing of duct work or hanging electrical equipment from duct work or piping is prohibited unless such electrical items directly serve a piece of equipment mounted directly on the mechanical system.

E. Where cutting is required to facilitate construction, patch and repair cut items to original state.

1. Do not cut structural work without prior written approval of Engineer.
2. Cut holes through concrete and masonry in new and existing structures with a diamond core drill or concrete saw.
3. Pneumatic hammer, impact electric, hand or manual hammer type drills not allowed except where permitted by Engineer because of limited work space.

F. Where electrical equipment is located in wet locations, on damp or wet walls, or where otherwise indicated on drawings, provide "stand-off" mounting minimum ½ inch from the wall to allow air circulation behind equipment.

G. At project completion, clean all equipment to the original finish.

1. Remove all shipping labels and adhesives.

2. Repair all blemishes to factory applied finishes. Touch-up paint shall match original finish.

II. Wiring Devices

A. General

1. Installed in boxes.
2. Pulled tight so device is secure and rigidly mounted.
3. Provided with a matching cover plate of type suitable for installed environment.
4. Terminations:

    a. If side wired, wire shall be looped in a clockwise direction and shall be fully under head of terminal.
    b. If back wired, conductor shall be fully seated in opening. Conductor shall not be visible when correctly installed.

5. Have wire terminals tightened to manufacturer's recommendations.
6. When more than one device is shown on the drawings in one location, they shall be installed in gang type box of proper size for the number of devices shown unless noted on the drawings to be installed at different heights or in separate boxes.

B. Switches:

1. Installed 42 inches above finished floor to center of device unless otherwise noted on the drawings.
2. Height may vary slightly to accommodate construction; however all switches in any one room shall be installed at the same height unless approved in writing by the Engineer.
3. Where switches are installed gang mounted and more than one voltage is in the same box, or where switches control a 277V circuit, barriers shall be provided between switches.
4. Install switches plumb and parallel to adjacent surfaces.
5. Single throw toggle switches shall be installed so that they are in the up position when the load is on.

C. Receptacles:

1. Installed 18 inches above finished floor to center of device unless otherwise noted on the electrical drawings.
2. Height may vary slightly to accommodate construction; however, all receptacles in any one room shall be installed at the same height unless approved in writing by the Engineer.
3. Receptacles noted on the drawings to be above counter shall be mounted horizontally so that bottom of box is four inches above backsplash unless noted on the drawings.
4. Dedicated use receptacles shall be mounted as to be readily accessible and not obstructed by permanently installed equipment, cabinetry, or mechanical piping and ductwork.

5. GFCI Receptacles:

a. Provided only where shown on the drawings.
b. Seal all connections with seal coat compound and wrap with two layers of tape.
c. Where used to feed other devices, GFCI Receptacle must be in the same room as downstream protected devices.
d. Downstream protected devices shall be labeled "GFCI Protected."

III. Coverplates

A. Plates shall fit tight and flat to surface without gaps or placing a strain on plate.

B. Plates shall be of the correct type for the installation:

1. Coverplate shall be suitable for the installed environment.
2. Coverplate shall be compatible with the installed device.
3. Coverplate shall match the type of box installed.

C. Blank plates shall be installed on all boxes which do not have devices installed in them.

D. Provide jumbo plates for outlets in masonry walls or where standard sized plate does not adequately cover box opening.

E. Multiple gang plates shall be used for gang mounted devices.

F. Exterior and Wet Location Coverplates:

1. Coverplates shall be of the correct type for the installed device and box.
2. All switches in fish processing areas shall be provided with weatherproof covers.
3. Receptacles in fish processing areas shall be provided with the following coverplate types:

a. Receptacles mounted within 6 inches of the top of the rearing tanks or below shall be provided with weatherproof while-in-use type coverplates.
b. Receptacles mounted higher than 6 inches above the top level of the rearing tanks shall be provided with weatherproof coverplates.
c. Receptacles mounted at the ceiling do not need to be provided with weatherproof or weatherproof while-in-use coverplates.

METHOD OF MEASUREMENT

A. This work will be measured for payment as indicated for the items noted below:

1. GATE STRUCTURE – ELECTRICAL WORK as shown on the Electrical Drawings in the Gate Plans Volume shall be measured for payment as a single lump sum item.

2. LOCK CONTROL SYSTEM as shown on the Electrical Drawings in the Lock Plans Volume shall be measured for payment as a single lump sum item.

3. SITE ELECTRICAL SYSTEM as shown on the Electrical Drawings in the Site Improvements Plan Volume shall be measured for payment as a single lump sum item.

BASIS OF PAYMENT

A. Work described in this Special Provision shall not be paid separately but shall be considered included with the following Pay Items:

1. GATE STRUCTURE – ELECTRICAL WORK shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

2. LOCK CONTROL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

3. SITE ELECTRICAL SYSTEM shall be paid for at the contract lump sum price including, but not limited to, all labor, materials, and equipment as required to provide a complete and operable system as shown on the plans.

END OF SPECIAL PROVISION WIRING DEVICES

CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES
Effective: October 2, 2001
Revised: April 30, 2010

Description. This work shall consist of the containment, collection, temporary storage, transportation and disposal of waste from lead paint removal projects. Waste requiring containment and control includes, but is not limited to, old paint, spent abrasives, corrosion products, mill scale, dirt, dust, grease, oil, salts, and water used for cleaning the surface of existing lead coatings prior to overcoating.

General. The existing coatings contain lead and may also contain other toxic metals. This specification provides the requirements for containment and for the protection of the public, and the environment from exposure to harmful levels of toxic metals that may be present in the paint being removed or repaired. The Contractor shall take reasonable and appropriate precautions to protect the public from the inhalation or ingestion of dust or debris from the operations, and is responsible for the clean-up of all spills of waste at no additional cost to the Department.

The Contractor shall comply with the requirements of this Specification and all applicable Federal, State, and Local laws, codes, and regulations, including, but not limited to the regulations of the United States Environmental Protection Agency (USEPA), Occupational Safety and Health Administration (OSHA), and Illinois Environmental Protection Agency (IEPA). The Contractor shall comply with all applicable regulations even if the regulation is not specifically referenced herein. If a Federal, State, or Local regulation is more restrictive than the requirements of this Specification, the more restrictive requirements shall prevail.

Submittals. The Contractor shall submit for Engineer review and acceptance, the following drawings and plans for accomplishing the work. The submittals shall be provided within 30 days of execution of the contract unless given written permission by the Engineer to submit them at a later date. Work cannot proceed until the submittals are accepted by the Engineer. Details for each of the plans are presented within the body of this specification. The Contractor shall also maintain on site, copies of the standards and regulations referenced herein (list provided in appendix 1).

a) Containment Plans. The containment plans shall include drawings, equipment specifications, and calculations (wind load, air flow and ventilation when negative pressure is specified. The plans shall include copies of the manufacturer's specifications for the containment materials and equipment that will be used to accomplish containment and ventilation.

   When required by the contract plans, the submittal shall provide calculations that assure the structural integrity of the bridge when it supports the containment and the calculations and drawings shall be signed and sealed by a Structural Engineer licensed in the state of Illinois.

   When working over the railroad or navigable waterways, the Department will notify the respective agencies that work is being planned. Unless otherwise directed by the Engineer, the Contractor is responsible for follow up contact, and shall provide evidence that the

railroad, Coast Guard, Corps of Engineers, and other applicable agencies are satisfied with the clearance provided and other safety measures that are proposed.

b) Environmental Monitoring Plan. The Environmental Monitoring Plan shall address the visual inspections and clean up of the soil and water that the Contractor will perform, including final project inspection and cleanup. The plan shall address the daily visible emissions observations that will be performed and the corrective action that will be implemented in the event emissions or releases occur. When high volume ambient air monitoring is required, an Ambient Air Monitoring Plan shall be developed. The plan shall include:

- Proposed monitor locations and power sources in writing. A site sketch shall be included, indicating sensitive receptors, monitor locations, and distances and directions from work area.
- Equipment specification sheet for monitors to be used, and a written commitment to calibrate and maintain the monitors.
- Include a procedure for operation of monitors per 40 CFR 50, Appendix B, including use of field data chain-of-custody form. Include a sample chain of custody form.
- Describe qualifications/training of monitor operator.
- The name, contact information (person's name and number), and certification of the laboratory performing the filter analysis. Laboratory shall be accredited by one of the following: 1) the American Industrial Hygiene Association (AIHA) for lead (metals) analysis, 2) Environmental Lead Laboratory Accreditation Program (ELLAP) for metals analysis, 3) State or federal accreditation program for ambient air analysis or, 4) the EPA National Lead Laboratory Accreditation Program (NLLAP) for lead analysis. The laboratory shall provide evidence of certification, a sample laboratory chain-of-custody form, and sample laboratory report that provides the information required by this specification. The laboratory shall also provide a letter committing to do the analysis per 40 CFR 50, Appendix G. If the analysis will not be performed per 40 CFR Appendix G, a proposed alternate method shall be described, together with the rationale for using it. The alternate method can not be used unless specifically accepted by the Engineer in writing.

c) Waste Management Plan. The Waste Management Plan shall address all aspects of waste handling, storage, testing, hauling and disposal. Include the names, addresses, and a contact person for the proposed licensed waste haulers and disposal facilities. Submit the name and qualifications of the laboratory proposed for Toxicity Characteristic Leaching Procedure (TCLP) analysis. If the use of abrasive additives is proposed, provide the name of the additive, the premixed ratio of additive to abrasive being provided by the supplier, and a letter from the supplier of the additive indicating IEPA acceptance of the material. Note that the use of any steel or iron based material, such as but not limited to grit, shot, fines, or filings as an abrasive additive is prohibited.

d) Contingency Plan. The Contractor shall prepare a contingency plan for emergencies including fire, accident, failure of power, failure of dust collection system, failure of supplied air system or any other event that may require modification of standard operating procedures during lead removal. The plan shall include specific procedures to ensure safe egress and proper medical attention in the event of an emergency.

When the Engineer accepts the submittals, the Contractor will receive written notification. The Contractor shall not begin any work until the Engineer has accepted the submittals. The Contractor shall not construe Engineer acceptance of the submittals to imply approval of any particular method or sequence for conducting the work, or for addressing health and safety concerns. Acceptance of the plans does not relieve the Contractor from the responsibility to conduct the work according to the requirements of Federal, State, or Local regulations, this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

Quality Control (QC) Inspections. The Contractor shall perform first line, in process QC inspections of all environmental control and waste handling aspects of the project to verify compliance with these specification requirements and the accepted drawings and plans. The Contractor shall use the IDOT Environmental Daily Report form supplied by the Engineer to record the results of the inspections. The completed reports shall be turned into the Engineer before work resumes the following day. Contractor QC inspections shall include, but not be limited to the following:

- Proper installation and continued performance of the containment system(s) in accordance with the approved drawings.
- Visual inspections of emissions into the air and verification that the cause(s) for any unacceptable emissions is corrected.
- Set up, calibration, operation, and maintenance of the regulated area and high volume ambient air monitoring equipment, including proper shipment of cassettes/filters to the laboratory for analysis. Included is verification that the Engineer receives the results within the time frames specified and that appropriate steps are taken to correct work practices or containment in the event of unacceptable results.
- Visual inspections of spills or deposits of contaminated materials into the water or onto the ground, pavement, soil, or slope protection. Included is verification that proper cleanup is undertaken and that the cause(s) of unacceptable releases is corrected.
- Proper implementation of the waste management plan including laboratory analysis and providing the results to the Engineer within the time frames specified herein.
- Proper implementation of the contingency plans for emergencies.

The personnel providing the QC inspections shall poses current SSPC-C3 certification or equal, including the annual training necessary to maintain that certification (SSPC-C5 or equal), and shall provide evidence of successful completion of 2 projects of similar or greater complexity and scope that have been completed in the last 2 years. References shall include the name, address, and telephone number of a contact person employed by the bridge owner. Proof of initial certification and the current annual training shall also be provided.

Quality Assurance (QA) Observations. The Engineer will conduct QA observations of any or all of the QC monitoring inspections that are undertaken. The presence or activity of Engineer

observations in no way relieves the Contractor of the responsibility to provide all necessary daily QC inspections of its own and to comply with all requirements of this Specification.

Containment Requirements. The Contractor shall install and maintain containment systems surrounding the work for the purpose of controlling emissions of dust and debris according to the requirements of this specification. Working platforms and containment materials that are used shall be firm and stable and platforms shall be designed to support the workers, inspectors, spent surface preparation media (e.g., abrasives), and equipment during all phases of surface preparation and painting. Platforms, cables, and other supporting structures shall be designed according to OSHA regulations. If the containment needs to be attached to the structure, the containment shall be attached by bolting, clamping, or similar means. Welding or drilling into the structure is prohibited unless approved by the Engineer in writing.

The containment shall be dropped in the event of sustained winds of 40 mph (64 kph) or greater and all materials and equipment secured.

The Contractor shall provide drawings showing the containment system and indicating the method(s) of supporting the working platforms and containment materials to each other and to the bridge. When the use of negative pressure and airflow inside containment is specified, the Contractor shall provide all ventilation calculations and details on the equipment that will be used for achieving the specified airflow and dust collection.

When directed in the contract plans, the Contractor shall submit calculations and drawings, signed and sealed by a Structural Engineer licensed in the state of Illinois, that assure the structural integrity of the bridge under the live and dead loads imposed, including the design wind loading.

When working over railroads, the Contractor shall provide evidence that the proposed clearance and the safety provisions that will be in place (e.g., flagman) are acceptable to the railroad. In the case of work over navigable waters, the Contractor shall provide evidence that the proposed clearance and provisions for installing or moving the containment out of navigation lanes is acceptable to authorities such as the Coast Guard and Army Corps of Engineers. The Contractor shall include plans for assuring that navigation lighting is not obscured, or if it is obscured, that temporary lighting is acceptable to the appropriate authorities (e.g., Coast Guard) and will be utilized.

Engineer review and acceptance of the drawings and calculations shall not relieve the Contractor from the responsibility for the safety of the working platforms and containment, and for providing ample ventilation to control worker and environmental exposures. After the work platforms and containment materials are erected additional measures may be needed to ensure worker safety according to OSHA regulations. The Contractor shall institute such measures at no additional cost to the Department.

Containment for the cleaning operation of this contract is defined as follows:

- The containment system shall maintain the work area free of visible emissions of dust and debris according to all provisions of this Specification, with no debris permitted outside of

the regulated area at any time. All debris within the regulated area and within the containment shall be collected at the end of the last shift each day, and properly stored in sealed containers. Cleaning shall be accomplished by HEPA vacuuming unless it is conducted within a containment that is designed with a ventilation system capable of collecting the airborne dust and debris created by sweeping and blowing with compressed air. The ventilation system shall be in operation during the cleaning.

- The containment systems shall comply with the specified SSPC Guide 6 classifications as presented in Table 1 for the method of paint removal utilized.

- TSP-lead in the air at monitoring locations selected by the Contractor shall comply with the requirements specified herein.

The Contractor shall take appropriate action to avoid personnel injury or damage to the structure from the installation and use of the containment system. If the Engineer determines that there is the potential for structural damage caused by the installed containment system, the Contractor shall take appropriate action to correct the situation.

In addition to complying with the specific containment requirements in Table 1 for each method of removal, the Contractor shall provide and maintain coverage over the ground in the areas to be cleaned. This coverage shall be capable of catching and containing surface preparation media, paint chips, and paint dust in the event of an accidental escape from the primary containment. The containment materials shall be cleaned of loose material prior to relocation or dismantling. Acceptable methods of cleaning include blowing down the surfaces with compressed air while the ventilation system is in operation, HEPA vacuuming, and/or wet wiping. If paint chips or dust is observed escaping from the containment materials during moving, all associated operations shall be halted and the materials and components recleaned.

The containment systems shall also meet the following requirements:

a) Dry Abrasive Blast Cleaning - Full Containment with Negative Pressure (SSPC Class 1A)

The enclosure shall be designed, installed, and maintained to sustain maximum anticipated wind forces, including negative pressure. Flapping edges of containment materials are prohibited and the integrity of all containment materials, seams, and seals shall be maintained for the duration of the project. Airflow inside containment shall be designed to provide visibility and reduce worker exposures to toxic metals according to OSHA regulations and as specified in Table 1 and its accompanying text. When the location of the work on the bridge, or over lane closures permit, the blast enclosure shall extend a minimum of 3 ft. (1 m) beyond the limits of surface preparation to allow the workers to blast away from, rather than into the seam between the containment and the structure. The blast enclosure shall have an airlock or resealable door entryway to allow entrance and exit from the enclosure without allowing the escape of blasting residue.

If recyclable metallic abrasives are used, the Contractor shall operate the equipment in a manner that minimizes waste generation. Steps shall also be taken to minimize dust generation during the transfer of all abrasive/paint debris (expendable or recyclable

abrasives) for recycling or disposal. Acceptable methods include, but are not limited to vacuuming, screw or belt conveyance systems, or manual conveyance. However manual conveyance is only permitted if the work is performed inside a containment that is equipped with an operating ventilation system capable of controlling the dust that is generated.

Appropriate filtration shall be used on the exhaust air of dust collection and abrasive recycling equipment as required to comply with IEPA regulations. The equipment shall be enclosed if visible dust and debris are being emitted and/or the regulated area or high volume monitor lead levels are not in compliance.

Areas beneath containment connection points that were shielded from abrasive blast cleaning shall be prepared by vacuum blast cleaning or vacuum-shrouded power tool cleaning after the containment is removed.

b) Vacuum Blast Cleaning within Containment (SSPC-Class 4A)

Vacuum blasting equipment shall be fully automatic and capable of cleaning and recycling the abrasive. The system shall be designed to deliver cleaned, recycled blasting abrasives and provide a closed system containment during blasting. The removed coating, mill scale, and corrosion shall be separated from the abrasive, and stored for disposal.

The Contractor shall attach containment materials around and under the work area to catch and contain abrasive and waste materials in the event of an accidental escape from the vacuum shroud. This containment is in addition to the ground covers specified earlier.

It is possible that the close proximity of some structural steel members, such as the end diaphragms or end cross-frames underneath transverse deck expansion joints, preclude the use of the vacuum blasting equipment for the removal of the old paint. For surfaces that are inaccessible for the nozzles of the vacuum blasting equipment, the Contractor shall remove the paint by means of full containment inside a complete enclosure as directed by the Engineer.

c) Vacuum-Shrouded Power Tool Cleaning within Containment (SSPC-Class 3P)

The Contractor shall utilize power tools equipped with vacuums and High Efficiency Particulate Air (HEPA) filters. The Contractor shall attach containment walls around the work area, and install containment materials beneath the work area to catch and contain waste materials in the event of an accidental escape from the vacuum shroud. This containment is in addition to the ground covers specified earlier and shall be installed within 10 ft. (3m) of the areas being cleaned.

d) Power Tool Cleaning without Vacuum, within Containment (SSPC-Class 2P)

When the use of power tools without vacuum attachments is authorized by the Engineer, the Contractor shall securely install containment walls and flooring around the work area to capture and collect all debris that is generated. The containment material requirements for this Class 2P are similar to Class 3P used for vacuum-shrouded tools, but the supporting

structure will be more substantial in Class 2P to better secure the containment materials from excessive movement that could lead to the loss of waste paint chips and debris. Containment beneath the work shall be within 10 ft. (3m) of the areas being cleaned, and is in addition to the ground covers specified earlier.

e) Water Washing, Water Jetting or Wet Abrasive Blast Cleaning within Containment (SSPC Class 2W-3W)

Water washing of the bridge for the purpose of removing chalk, dirt, grease, oil, bird nests, and other surface debris, and water jetting or wet abrasive blast cleaning for the purpose of removing paint and surface debris shall be conducted within a containment designed, installed, and maintained in order to capture and contain all water and waste materials. The containment shall consist of impermeable floors and lower walls to prevent the water and debris from escaping. Permeable upper walls and ceilings are acceptable provided the paint chips, debris, and water, other than mists, are collected. A fine mist passing through the permeable upper walls is acceptable, provided the environmental controls specified below are met. If paint chips, debris, or water, other than mists, escape the containment system, impermeable walls and ceilings shall be installed.

When water is used for surface cleaning, the collected water shall be filtered to separate the particulate from the water. Recycling of the water is preferred in order to reduce the volume of waste that is generated. The water after filtration shall be collected and disposed of according to the waste handling portions of this specification.

When a slurry is created by injecting water into the abrasive blast stream, the slurry need not be filtered to separate water from the particulate.

Environmental Controls and Monitoring. The Contractor shall prepare and submit to the Engineer for review and acceptance, an Environmental Monitoring Plan. The purpose of the plan is to address the observations and equipment monitoring undertaken by the Contractor to confirm that project dust and debris are not escaping the containment into the surrounding air, soil, and water.

a) Soil and Water. Containment systems shall be maintained to prevent the escape of paint chips, abrasives, and other debris into the water, and onto the ground, soil, slope protection, and pavements. Releases or spills of, paint chips, abrasives, dust and debris that have become deposited on surrounding property, structures, equipment or vehicles, and bodies of water are unacceptable. If there are inadvertent spills or releases, the Contractor shall immediately shut down the emissions-producing operations, clean up the debris, and change work practices, modify the containment, or take other appropriate corrective action as needed to prevent similar releases from occurring in the future.

Water booms, boats with skimmers, or other means as necessary shall be used to capture and remove paint chips or project debris that falls or escapes into the water.

At the end of each workday at a minimum, the work area inside and outside of containment, including ground tarpaulins, shall be inspected to verify that paint debris is not present. If

debris is observed, it shall be removed by hand and HEPA-vacuuming. If wet methods of preparation are used, the damp debris can remain overnight provided it is protected from accidental release by securely covering the waste, folding the waste into the ground tarps, or by other acceptable methods. Prior to commencing work the next day, the debris from the folded ground tarps shall be removed.

Upon project completion, the ground and water in and around the project site are considered to have been properly cleaned if paint chips, paint removal media (e.g., spent abrasives), fuel, materials of construction, litter, or other project debris have been removed.

NOTE: All project debris must be removed even if the debris (e.g.,spent abrasive and paint chips) was a pre-existing condition.

b) Visible Emissions. The Contractor shall conduct observations of visible emissions and releases on an ongoing daily basis when dust-producing activities are underway, such as paint removal, clean up, waste handling, and containment dismantling or relocation. Note that visible emissions observations do not apply to the fine mist that may escape through permeable containment materials when wet methods of preparation are used.

Visible emissions in excess of SSPC Guide 6, Level 1 (1% of the workday) are unacceptable. In an 8-hour workday, this equates to emissions of a cumulative duration no greater than 4.8 minutes (288 seconds). This criterion applies to scattered, random emissions of short duration. Sustained emissions from a given location (e.g., 1 minute or longer), regardless of the total length of emissions for the workday, are unacceptable and action shall be initiated to halt the emission.

If unacceptable visible emissions or releases are observed, the Contractor shall immediately shut down the emission-producing operations, clean up the debris, and change work practices, modify the containment, or take other appropriate corrective action as needed to prevent similar releases from occurring in the future.

c) Ambient Air Monitoring. The Contractor shall perform ambient air monitoring according to the following:

- Monitor Siting. The Contractor shall collect and analyze air samples to evaluate levels of TSP-lead if there are sensitive receptors within 5 times the height of the structure or within 1000 ft. (305 m) of the structure, whichever is greater. If sensitive receptors are not located within these limits, monitoring is not required. Sensitive receptors are areas of public presence or access including, but not limited to, homes, schools, parks, playgrounds, shopping areas, livestock areas, and businesses. The motoring public is not considered to be a sensitive receptor for the purpose of ambient air monitoring.

  The Contractor shall locate the monitors according to SSPC-TU-7, in areas of public exposure and in areas that will capture the maximum pollutant emissions resulting from the work. The Contractor shall identify the recommended monitoring sites in the Ambient Air Monitoring Plan, including a sketch identifying the above. The monitors shall not be sited until the Engineer accepts the proposed locations.

- Equipment Provided by Contractor. The Contractor shall provide up to 4 monitors per work site and all necessary calibration and support equipment, power to operate them, security (or arrangements to remove and replace the monitors daily), filters, flow chart recorders and overnight envelopes for shipping the filters to the laboratory. The number of monitors required will be indicated in the Plan Notes. Each monitor shall be tagged with the calibration date.

- Duration of Monitoring. Monitoring shall be performed for the duration of dust-producing operations (e.g., paint removal, waste handling, containment clean-up and movement, etc.) or a minimum of 8 hours each day (when work is performed).

  The monitoring schedule shall be as follows:

  1. For dry abrasive blast cleaning monitoring shall be conducted full time during all days of dust-producing operations (e.g., paint removal, waste handling, containment movement, etc.).
  2. For wet abrasive blast cleaning, water jetting, or power tool cleaning, monitoring shall be conducted for the first 5 days of dust producing operations. If the results after 5 days are acceptable, monitoring may be discontinued. If the results are unacceptable, corrective action shall be initiated to correct the cause of the emissions, and monitoring shall continue for an additional 5 days. If the results are still unacceptable, the Engineer may direct that the monitoring continue full time.
  3. When monitoring is discontinued, if visible emissions are observed and/or the Contractor's containment system changes during the course of the project, then air monitoring will again be required for a minimum of two consecutive days until compliance is shown.

- Background Monitoring. Background samples shall be collected for two days prior to the start of work while no dust producing operations are underway to provide a baseline. The background monitoring shall include one weekday and one weekend day. The background monitoring shall coincide with the anticipated working hours for the paint removal operations, but shall last for a minimum of 8 hours each day.

- Monitor Operation and Laboratory Analysis.

  The Contractor shall calibrate the monitors according to the manufacturer's written instructions upon mobilization to the site and quarterly. Each monitor shall be tagged with the calibration date, and calibration information shall be provided to the Engineer upon request.

  All ambient air monitoring shall be performed by the Contractor according to the accepted Ambient Air Monitoring Plan and according to EPA regulations 40 CFR Part 50 Appendix B, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method), and 40 CFR Part 50 Appendix G, Reference Method for the Determination of Lead in Suspended Particulate Matter Collected from Ambient Air.

Filters shall be placed in monitors and monitors operated each day prior to start of dust-producing operations and the filters removed upon completion each day. The Contractor shall advise the Engineer in advance when the filters will be removed and replaced. The monitor operator shall record the following information, at a minimum, on field data and laboratory chain-of-custody forms (or equivalent):

1. Monitor location and serial number
2. Flow rate, supported by flow charts
3. Start, stop times and duration of monitoring
4. Work activities and location of work during the monitoring period
5. Wind direction/speed

For the first 5 days of monitoring, the Contractor shall submit the filters, field data and laboratory chain-of-custody forms together with the flow chart recorders (i.e. monitor flow rate and the duration of monitoring) on a daily basis in an overnight envelope to the laboratory for analysis. The laboratory must provide the Engineer with written results no later than 72 hours after the completion of each day's monitoring. At the discretion of the Engineer, if the initial 5 days of monitoring on full time monitoring projects is acceptable, the filters may be sent to the laboratory every 3 days rather than every day. Written results must be provided to the Engineer no later than 5 days after the completion of monitoring for the latest of the 3 days.

- Ambient Air Monitoring Results. The laboratory shall provide the report directly to the Engineer with a copy to the contractor. The report shall include:

  1. Monitor identification and location
  2. Work location and activities performed during monitoring period
  3. Monitor flow rate, duration, and volume of air sampled
  4. Laboratory methods used for filter digestion / analysis
  5. Sample results for the actual duration of monitoring
  6. Sample results expressed in terms of a 24 hour time weighted average. Assume zero for period not monitored.
  7. Comparison of the results with the acceptance criteria indicating whether the emissions are compliant.
  8. Field data and chain-of-custody records used to derive results.

  Should revised reports or any information regarding the analysis be issued by the laboratory directly to the Contractor at any time, the contractor shall immediately provide a copy to the Engineer and advise the laboratory that the Engineer is to receive all information directly from the laboratory.

- Acceptance Criteria. TSP-lead results at each monitor location shall be less than 1.5 μg/cu m per calendar quarter converted to a daily allowance using the formulas from

SSPC Guide 6 as follows, except that the maximum 24-hour daily allowance shall be no greater than 6 μg/cu m.

The formula for determining a 24-hour daily value based on the actual number of paint disturbance days expected to occur during the 90-day quarter is:

DA = (90 ÷ PD) x 1.5 μg/cu m, where

DA is the daily allowance, and
PD is the number of preparation days anticipated in the 90-day period
If the DA calculation is > 6.0 μg/cu m, use 6.0 μg/cu m.

Regulated Areas. Physically demarcated regulated area(s) shall be established around exposure producing operations at the OSHA Action Level for the toxic metal(s) present in the coating. The Contractor shall provide all required protective clothing and equipment for personnel entering into a regulated area. Unprotected street clothing is not permitted within the regulated areas.

Hygiene Facilities/Protective Clothing/Blood Tests. The Contractor shall provide clean lavatory and hand washing facilities according to OSHA regulations and confirm that employees wash hands, forearms, and face before breaks. The facilities shall be located at the perimeter of the regulated area in close proximity to the paint removal operation. Shower facilities shall be provided when workers' exposures exceed the Permissible Exposure Limit. Showers shall be located at each bridge site, or if allowed by OSHA regulations, at a central location to service multiple bridges. The shower and wash facilities shall be cleaned at least daily during use.

All wash and shower water shall be filtered and containerized. The Contractor is responsible for filtration, testing, and disposal of the water.

The Contractor shall make available to all IDOT project personnel a base line and post project blood level screening determined by the whole blood lead method, utilizing the Vena-Puncture technique. This screening shall be made available every 2 months for the first 6 months, and every 6 months thereafter.

The Contractor shall provide IDOT project personnel with all required protective clothing and equipment, including disposal or cleaning. Clothing and equipment includes but is not limited to disposable coveralls with hood, booties, disposable surgical gloves, hearing protection, and safety glasses. The protective clothing and equipment shall be provided and maintained on the job site for the exclusive, continuous and simultaneous use by the IDOT personnel. This equipment shall be suitable to allow inspection access to any area in which work is being performed.

All handwash and shower facilities shall be fully available for use by IDOT project personnel.

Site Emergencies.

a) Stop Work. The Contractor shall stop work at any time the conditions are not within specifications and take the appropriate corrective action. The stoppage will continue until conditions have been corrected. Standby time and cost required for corrective action is at the Contractor's expense. The occurrence of the following events shall be reported in writing to IDOT and shall require the Contractor to automatically stop lead paint removal and initiate clean up activities.

- Airborne lead levels at any of the high volume ambient air monitoring locations that exceed the limits in this specification, or airborne lead in excess of the OSHA Action Level at the boundary of the regulated area.
- Break in containment barriers.
- Visible emissions in excess of the specification tolerances.
- Loss of negative air pressure when negative air pressure is specified (e.g., for dry abrasive blast cleaning).
- Serious injury within the containment area.
- Fire or safety emergency
- Respiratory system failure
- Power failure

b) Contingency Plans and Arrangements. The Engineer will refer to the contingency plan for site specific instructions in the case of emergencies.

The Contractor shall prepare a contingency plan for emergencies including fire, accident, failure of power, failure of dust collection system, failure of supplied air system or any other event that may require modification of standard operating procedures during lead removal. The plan shall include specific procedures to ensure safe egress and proper medical attention in the event of an emergency. The Contractor shall post the telephone numbers and locations of emergency services including fire, ambulance, doctor, hospital, police, power company and telephone company on clean side of personnel decontamination area.

A two-way radio, or equal, as approved by the Engineer, capable of summoning emergency assistance shall be available at each bridge during the time the Contractor's personnel are at the bridge site under this contract. The following emergency response equipment described in the contingency plan (generic form attached) shall be available during this time as well: an appropriate portable fire extinguisher, a 55 gal (208 L) drum, a 5 gal (19 L) pail, a long handled shovel, absorbent material (one bag).

A copy of the contingency plan shall be maintained at each bridge during cleaning operations and during the time the Contractor's personnel are at the bridge site under this contract. The Contractor shall designate the emergency coordinator(s) required who shall be responsible for the activities described.

An example of a contingency plan is included at the end of this Special Provision.

Collection, Temporary Storage, Transportation and Disposal of Waste. The Contractor and the Department are considered to be co-generators of the waste.

The Contractor is responsible for all aspects of waste collection, testing and identification, handling, storage, transportation, and disposal according to these specifications and all applicable Federal, State, and Local regulations. The Contractor shall provide for Engineer review and acceptance a Waste Management Plan that addresses all aspects of waste handling, storage, and testing, and provides the names, addresses, and a contact person for the proposed licensed waste haulers and disposal facilities. The Department will not perform any functions relating to the waste other than provide EPA identification numbers, provide the Contractor with the emergency response information, the emergency response telephone number required to be provided on the manifest, and to sign the waste manifest. The Engineer will obtain the identification numbers from the state and federal environmental protection agencies for the bridge(s) to be painted and furnish those to the Contractor.

All surface preparation/paint residues shall be collected daily and deposited in all-weather containers supplied by the Contractor as temporary storage. The storage area shall be secure to prevent unauthorized entry or tampering with the containers. Acceptable measures include storage within a fully enclosed (e.g., fenced in) and locked area, within a temporary building, or implementing other reasonable means to reduce the possibility of vandalism or exposure of the waste to the public or the environment (e.g., securing the lids or covers of waste containers and roll-off boxes). Waste shall not be stored outside of the containers. Waste shall be collected and transferred to bulk containers taking extra precautions as necessary to prevent the suspension of residues in air or contamination of surrounding surfaces. Precautions may include the transfer of the material within a tarpaulin enclosure. Transfer into roll-off boxes shall be planned to minimize the need for workers to enter the roll-off box.

No residues shall remain on surfaces overnight, either inside or outside of containment. Waste materials shall not be removed through floor drains or by throwing them over the side of the bridge. Flammable materials shall not be stored around or under any bridge structures.

The all-weather containers shall meet the requirements for the transportation of hazardous materials and as approved by the Department. Acceptable containers include covered roll-off boxes and 55-gallon drums (17H). The Contractor shall insure that no breaks and no deterioration of these containers occurs and shall maintain a written log of weekly inspections of the condition of the containers. A copy of the log shall be furnished to the Engineer upon request. The containers shall be kept closed and sealed from moisture except during the addition of waste. Each container shall be permanently identified with the date that waste was placed into the container, contract number, hazardous waste name and ID number, and other information required by the IEPA.

The Contractor shall have each waste stream sampled for each project and tested by TCLP and according to EPA and disposal company requirements. The Engineer shall be notified in advance when the samples will be collected. The samples shall be collected and shipped for testing within the first week of the project, with the results due back to the Engineer within 10 days. Testing shall be considered included in the pay item for “Containment and Disposal of

Lead Paint Cleaning Residues." Copies of the test results shall be provided to the Engineer prior to shipping the waste.

Waste water generated from bridge washing, hygiene purposes, and cleaning of equipment shall be filtered on site to remove particulate and disposed of at a Publicly Owned Treatment Works (POTW) according to State regulations. The Contractor shall provide the Engineer with a letter from the POTW indicating that they will accept the waste water. If the POTW allows the filtered water to be placed into the sanitary sewer system, the Contractor shall provide a letter from the POTW indicating that based on the test results of the water, disposal in the sanitary sewer is acceptable to them. Water shall not be disposed of until the above letter(s) are provided to, and accepted by, the Engineer.

If approved abrasive additives are used that render the waste non-hazardous as determined by TCLP testing, the waste shall be classified as a non-hazardous special waste, transported by a licensed waste transporter, and disposed of at an IEPA permitted disposal facility in Illinois.

When paint is removed from the bridge without the use of abrasive additives, the paint, together with the surface preparation media (e.g. abrasive) shall be handled as a hazardous waste, regardless of the TCLP results. The waste shall be transported by a licensed hazardous waste transporter, treated by an IEPA permitted treatment facility to a non-hazardous special waste and disposed of at an IEPA permitted disposal facility in Illinois.

The treatment/disposal facilities shall be approved by the Engineer, and shall hold an IEPA permit for waste disposal and waste stream authorization for this cleaning residue. The IEPA permit and waste stream authorization must be obtained prior to beginning cleaning, except that if necessary, limited paint removal will be permitted in order to obtain samples of the waste for the disposal facilities. The waste shall be shipped to the facility within 90 days of the first accumulation of the waste in the containers. When permitted by the Engineer, waste from multiple bridges in the same contract may be transported by the Contractor to a central waste storage location(s) approved by the Engineer in order to consolidate the material for pick up, and to minimize the storage of waste containers at multiple remote sites after demobilization. Arrangements for the final waste pickup shall be made with the waste hauler by the time blast cleaning operations are completed or as required to meet the 90 day limit stated above.

The Contractor shall submit a waste accumulation inventory table to the Engineer no later than the 5th day of the month. The table shall show the number and size of waste containers filled each day in the preceding month and the amount of waste shipped that month, including the dates of shipments.

The Contractor shall prepare a manifest supplied by the IEPA for off-site treatment and disposal before transporting the hazardous waste off-site. The Contractor shall prepare a land ban notification for the waste to be furnished to the disposal facility. The Contractor shall obtain the handwritten signature of the initial transporter and date of the acceptance of the manifest. The Contractor shall send one copy of the manifest to the IEPA within two working days of transporting the waste off-site. The Contractor shall furnish the generator copy of the manifest and a copy of the land ban notification to the Engineer. The Contractor shall give the transporter the remaining copies of the manifest.

All other project waste shall be removed from the site according to Federal, State and Local regulations, with all waste removed from the site prior to final Contractor demobilization.

The Contractor shall make arrangements to have other hazardous waste, which he/she generates, such as used paint solvent, transported to the Contractor's facility at the end of each day that this waste is generated. These hazardous wastes shall be manifested using the Contractor's own generator number to a treatment or disposal facility from the Contractor's facility. The Contractor shall not combine solvents or other wastes with cleaning residue wastes. All waste streams shall be stored in separate containers.

The Contractor is responsible for the payment of any fines and undertaking any clean up activities mandated by State or federal environmental agencies for improper waste handling, storage, transportation, or disposal.

Contractor personnel shall be trained in the proper handling of hazardous waste, and the necessary notification and clean up requirements in the event of a spill. The Contractor shall maintain a copy of the personnel training records at each bridge site.

Basis of Payment. The soil, water, and air monitoring, containment, collection, temporary storage, transportation, testing and disposal of all project waste, and all other work described herein will be paid for at the contract lump sum price for CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES at the designated location. Payment will not be authorized until all requirements have been fulfilled as described in this specification, including the preparation and submittal of all QC documentation, submittal of environmental monitoring and waste test results, and disposal of all waste.

Appendix 1 – Reference List

The Contractor shall maintain the following reference standards and regulations on site for the duration of the project:

- Illinois Environmental Protection Agency – Information Statement on the Removal of Lead-Based Paint from Exterior Surfaces, latest revision
- Illinois Environmental Protection Act
- SSPC Guide 6, Guide for Containing Debris Generated During Paint Removal Operations
- 29 CFR 1926.62, Lead in Construction
- 40 CFR Part 50, Appendix B, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method)
- 40 CFR Part 50, Appendix G, Reference Method for the Determination of Lead in Suspended Particulate Matter Collected from Ambient Air
- SSPC Guide 16, Guide to Specifying and Selecting Dust Collectors
- SSPC TU-7, Conducting Ambient Air, Soil, and Water Sampling Activities During Surface Preparation and Paint Disturbance Activities.

Table 1 Containment Criteria for Removal of Paint Containing Lead and Other Toxic Metals[1]					
Removal Method	**SSPC Class[2]**	**Containment Material Flexibility**	**Containment Material Permeability[3]**	**Containment Support Structure**	**Containment Material Joints[4]**
Hand Tool Cleaning	3P[6]	Rigid or Flexible	Permeable or Impermeable	Minimal	Partially Sealed
Power Tool Cleaning w/ Vacuum	3P[6]	Rigid or Flexible	Permeable or Impermeable	Minimal	Partially Sealed
Power Tool Cleaning w/o Vacuum	2P	Rigid or Flexible	Permeable or Impermeable	Rigid or Flexible	Fully or Partially Sealed
Water Jetting Wet Ab Blast Water Cleaning[7]	2W-3W	Rigid or Flexible	Permeable and Impermeable[7]	Rigid, Flexible, or Minimal	Fully and Partially Sealed
Abrasive Blast Cleaning	1A	Rigid or Flexible	Impermeable	Rigid or Flexible	Fully Sealed
Vacuum Blast Cleaning	4A[6]	Rigid or Flexible	Permeable	Minimal	Partially Sealed

Table 1 (Continued) Containment Criteria for Removal of Paint Containing Lead and Other Toxic Metals[1]					
Removal Method	**SSPC Class[2]**	**Containment Entryway**	**Ventilation System Required[5]**	**Negative Pressure Required**	**Exhaust Filtration Required**
Hand Tool Cleaning	3P[6]	Overlapping or Open Seam	Natural	No	No
Power Tool Cleaning w/ Vacuum	3P[6]	Overlapping or Open Seam	Natural	No	No
Power Tool Cleaning w/o Vacuum	2P	Overlapping or Open Seam	Natural	No	No
Water Jetting Wet Ab Blast Water Cleaning[7]	2W-3W	Overlapping or Open Seam	Natural	No	No
Abrasive Blast Cleaning	1A	Airlock or Resealable	Mechanical	Yes	Yes
Vacuum Blast Cleaning	4A[6]	Open Seam	Natural	No	No

Notes:

[1]This table provides general design criteria only. It does not guarantee that specific controls over emissions will occur because unique site conditions must be considered in the design. Other combinations of materials may provide controls over emissions equivalent to or greater than those combinations shown above.

[2]The SSPC Classification is based on SSPC Guide 6. Note that for work over water, water booms or boats with skimmers must be employed, where feasible, to contain spills or releases. Debris must be removed daily at a minimum.

[3]Permeability addresses both air and water as appropriate. In the case of water removal methods, the containment materials must be resistant to water. Ground covers should always impermeable, and of sufficient strength to withstand the impact and weight of the debris and the equipment used for collection and clean-up. Ground covers must also extend beyond the containment boundary to capture escaping debris.

[4] If debris escapes through the seams, then additional sealing of the seams and joints is required.

[5]When "Natural" is listed, ventilation is not required provided the emissions are controlled as specified in this Special Provision, and provided worker exposures are properly controlled. If unacceptable emissions or worker exposures to lead or other toxic metals occur, incorporate a ventilation system into the containment.

[6]Ground covers and wall tarpaulins may provide suitable controls over emissions without the need to completely enclose the work area.

[7]This method applies to water cleaning to remove surface contaminants, and water jetting (with and without abrasive) and wet abrasive blast cleaning where the goal is to remove paint. Although both permeable and impermeable containment materials are included, ground covers and the lower portions of the containment must be water impermeable with fully sealed joints, and of sufficient strength and integrity to facilitate the collection and holding of the water and debris for proper disposal. If water or debris, other than mist, escape through upper sidewalls or ceiling areas constructed of permeable materials, they shall be replaced with impermeable materials. Permeable materials for the purpose of this specification are defined as materials with openings measuring 25 mils (1 micron) or less in greatest dimension.

A. Containment Components - The basic components that make up containment systems are defined below. The components are combined in Table 1 to establish the minimum containment system requirements for the method(s) of paint removal specified for the Contract.

1. Rigidity of Containment Materials - Rigid containment materials consist of solid panels of plywood, aluminum, rigid metal, plastic, fiberglass, composites, or similar materials. Flexible materials consist of screens, tarps, drapes, plastic sheeting, or similar materials. When directed by the Engineer, do not use flexible materials for horizontal surfaces directly over traffic lanes or vertical surfaces in close proximity to traffic lanes. If the Engineer allows the use of flexible materials, The Contractor shall take special precautions to completely secure the materials to prevent any interference with traffic.

2. Permeability of Containment Materials - The containment materials are identified as air impenetrable if they are impervious to dust or wind such as provided by rigid panels, coated solid tarps, or plastic sheeting. Air penetrable materials are those that are formed or woven to allow air flow. Water impermeable materials are those that are capable of containing and controlling water when wet methods of preparation are used. Water permeable materials allow the water to pass through. Chemical resistant materials are those resistant to chemical and solvent stripping solutions. Use fire retardant materials in all cases.

3. Support Structure - Rigid support structures consist of scaffolding and framing to which the containment materials are affixed to minimize movement of the containment cocoon. Flexible support structures are comprised of cables, chains, or similar systems to which the containment materials are affixed. Use fire retardant materials in all cases.

4. Containment Joints - Fully sealed joints require that mating surfaces between the containment materials and to the structure being prepared are completely sealed. Sealing measures include tape, caulk, Velcro, clamps, or other similar material capable of forming a continuous, impenetrable or impermeable seal. When materials are overlapped, a minimum overlap of 8 in. (200 mm) is required.

5. Entryway - An airlock entryway involves a minimum of one stage that is fully sealed to the containment and which is maintained under negative pressure using the ventilation system of the containment. Resealable door entryways involve the use of flexible or rigid doors capable of being repeatedly opened and resealed. Sealing methods include the use of zippers, Velcro, clamps, or similar fasteners. Overlapping door tarpaulin entryways consist of two or three overlapping door tarpaulins.

6. Mechanical Ventilation - The requirement for mechanical ventilation is to ensure that adequate air movement is achieved to reduce worker exposure to toxic metals to as low as feasible according to OSHA regulations (e.g., 29 CFR 1926.62), and to enhance visibility. Design the system with proper exhaust ports or plenums, adequately sized ductwork, adequately sized discharge fans and air cleaning devices (dust collectors) and properly sized and distributed make-up air points to achieve a uniform air flow inside containment for visibility. The design target for airflow shall be a minimum of 100 ft. (30.5m) per minute cross-draft or 60 ft. (18.3 m) per minute downdraft. Increase these minimum airflow requirements if necessary to address worker lead exposures. Natural ventilation does not require the use of mechanical equipment for moving dust and debris through the work area.

7. Negative Pressure - When specified, achieve a minimum of 0.03 in. (7.5 mm) water column (W.C.) relative to ambient conditions, or confirm through visual assessments for the concave appearance of the containment enclosure.

8. Exhaust Ventilation - When mechanical ventilation systems are used, provide filtration of the exhaust air, to achieve a filtration efficiency of 99.9 percent at 0.02 mils (0.5 microns).

HAZARDOUS WASTE
CONTINGENCY PLAN
FOR
LEAD BASED PAINT REMOVAL PROJECTS

Bridge No.: _____
Location: _____
USEPA Generator No.: _____
IEPA Generator No.: _____

Note:

1. A copy of this plan must be kept at the bridge while the Contractor's employees are at the site.

2. A copy of the plan must be mailed to the police and fire departments and hospital identified herein.

Primary Emergency Coordinator

Name: _____
Address: _____
City: _____
Phone: (Work) _____
(Home) _____

Alternate Emergency Coordinator

Name: _____
Address: _____
City: _____
Phone: (Work) _____
(Home) _____

Emergency Response Agencies

POLICE:

1. State Police (if bridge not in city) Phone:_____

   District No. _____

   Address: _____

2. County Sheriff _____Phone: _____

   County: _____

   Address: _____

3. City Police _____Phone: _____

   District No. _____

   Address: _____

Arrangements made with police: (Describe arrangements or refusal by police to make arrangements):

_____

_____

FIRE:

1. City _____Phone: _____

   Name: _____

   Address:_____

2. Fire District _____Phone: _____

   Name: _____

   Address: _____

3. Other _____ Phone: _____

Name: _____

Address: _____

Arrangements made with fire departments: (Describe arrangements or refusal by fire departments to make arrangements):

_____

_____

HOSPITAL:

Name: _____ Phone: _____

Address: _____

Arrangements made with hospital: (Describe arrangements or refusal by hospital to make arrangements):

_____

_____

Properties of waste and hazard to health:

Places where employees working:

Location of Bridge:

Types of injuries or illness which could result:

Appropriate response to release of waste to the soil:

Appropriate response to release of waste to surface water:

Emergency Equipment at Bridge

Emergency Equipment List	Location of Equipment	Description of Equipment	Capability of Equipment
1. Two-way radio	Truck		Communication
2. Portable Fire Extinguisher	Truck		Extinguishes Fire
3. Absorbent Material	Truck		Absorbs Paint or Solvent Spills
4. Hand Shovel	Truck		Scooping Material
5. 55 Gallon (208 L) Drum	Truck		Storing Spilled Material
6. 5 Gallon (19 L) Pail	Truck		Storing Spilled Material

Emergency Procedure

1. Notify personnel at the bridge of the emergency and implement emergency procedure.

2. Identify the character, source, amount and extent of released materials.

3. Assess possible hazards to health or environment.

4. Contain the released waste or extinguish fire. Contact the fire department if appropriate.

5. If human health or the environment is threatened, contact appropriate police and fire department. In addition, the Emergency Services and Disaster Agency needs to be called using their 24-hour toll free number (800-782-7860) and the National Response Center using their 24-hour toll free number (800-824-8802).

6. Notify the Engineer that an emergency has occurred.

7. Store spilled material and soil contaminated by spill, if any, in a drum or pail. Mark and label the drum or pail for disposal.

8. Write a full account of the spill or fire incident including date, time, volume, material, and response taken.

9. Replenish stock of absorbent material or other equipment used in response.

STRUCTURAL REPAIR OF CONCRETE
Effective: March 15, 2006
Revised: February 6, 2013

Description. This work shall consist of structurally repairing concrete.

Materials. Materials shall be according to the following.

Item	Article/Section
(a) Portland Cement Concrete (Note 1)	1020
(b) R1 or R2 Concrete (Note 2)	
(c) Normal Weight Concrete (Notes 3 and 4)	
(d) Shotcrete (High Performance) (Note 5)	
(e) Reinforcement Bars	1006.10
(f) Anchor Bolts	1006.09
(g) Water	1002
(h) Curing Compound (Type I)	1022.01
(i) Cotton Mats	1022.02
(j) Protective Coat	1023.01
(k) Epoxy (Note 6)	1025
(l) Mechanical Bar Splicers	508.06(c)

Note 1. The concrete shall be Class SI, except the cement factor shall be a minimum 6.65 cwt/cu yd (395 kg/cu m), the coarse aggregate shall be a CA 16, and the strength shall be a minimum 4000 psi (27,500 kPa) compressive or 675 psi (4650 kPa) flexural at 14 days. A high range water-reducing admixture shall be used to obtain a 5-7 in. (125-175 mm) slump, but a cement factor reduction according to Article 1020.05(b)(8) is prohibited. A self-consolidating concrete mixture is also acceptable per Article 1020.04, except the mix design requirements of this note regarding the cement factor, coarse aggregate, strength, and cement factor reduction shall apply.

Note 2. The R1 or R2 concrete shall be from the Department's approved list of Packaged, Dry, Rapid Hardening, Cementitious Materials for Concrete Repairs. The R1 or R2 concrete shall comply with the air content and strength requirements for Class SI concrete as indicated in Note 1. Mixing shall be per the manufacturer's recommendations, except the water/cement ratio shall not exceed the value specified for Class SI concrete as indicated in Note 1. A high range water-reducing admixture shall be used to obtain a 5-7 in. (125-175 mm) slump, and a retarder may be required to allow time to perform the required field tests. The admixtures shall be per the manufacturer's recommendation, and the Department's approved list of Concrete Admixtures shall not apply.

Note 3. The "high slump" packaged concrete mixture shall be from the Department's approved list of Packaged, Dry, Formed, Concrete Repair Mixtures. The materials and preparation of aggregate shall be according to ASTM C 387. The cement factor shall be 6.65 cwt/cu yd (395 kg/cu m) minimum to 7.05 cwt/cu yd (418 kg/cu

m) maximum. Cement replacement with fly ash or ground granulated blast-furnace slag shall be according to Section 1020. The "high slump" packaged concrete mixture shall have a maximum water soluble chloride ion content of < 0.40 lb/cu yd (0.24 kg/cu m). The test shall be performed according to ASTM C 1218, and the "high slump" packaged concrete mixture shall have an age of 28 to 42 days at the time of test. The ASTM C 1218 test shall be performed by an independent lab a minimum of once every two years, and the test results shall be provided to the Department. The coarse aggregate shall be a maximum size of 1/2 in. (12.5 mm). The packaged concrete mixture shall comply with the air content and strength requirements for Class SI concrete as indicated in Note 1. Mixing shall be per the manufacturer's recommendations, except the water/cement ratio shall not exceed the value specified for Class SI concrete as indicated in Note 1. A high range water-reducing admixture shall be used to obtain a 5-7 in. (125-175 mm) slump. The admixture shall be per the manufacturer's recommendation, and the Department's approved list of Concrete Admixtures shall not apply. A maximum slump of 10 in. (250 mm) may be permitted if no segregation is observed by the Engineer in a laboratory or field evaluation.

Note 4 The "self-consolidating concrete" packaged concrete mixture shall be from the Department's approved list of Packaged, Dry, Formed, Concrete Repair Mixtures. The materials and preparation of aggregate shall be according to ASTM C 387. The cement factor shall be 6.65 cwt/cu yd (395 kg/cu m) minimum to 7.05 cwt/cu yd (418 kg/cu m) maximum. Cement replacement with fly ash or ground granulated blast-furnace slag shall be according to Section 1020. The "self-consolidating concrete" packaged concrete mixture shall have a maximum water soluble chloride ion content of < 0.40 lb/cu yd (0.24 kg/cu m). The test shall be performed according to ASTM C 1218, and the "self-consolidating concrete" packaged concrete mixture shall have an age of 28 to 42 days at the time of test. The ASTM C 1218 test shall be performed by an independent lab a minimum of once every two years, and the test results shall be provided to the Department. The concrete mixture should be uniformly graded, and the coarse aggregate shall be a maximum size of 1/2 in. (12.5 mm). The fine aggregate proportion shall be a maximum 50 percent by weight (mass) of the total aggregate used. The packaged concrete mixture shall comply with the air content and strength requirements for Class SI concrete as indicated in Note 1. Mixing shall be per the manufacturer's recommendations, except the water/cement ratio shall not exceed the value specified for Class SI concrete as indicated in Note 1. The admixtures used to produce self-consolidating concrete shall be per the manufacturer's recommendation, and the Department's approved list of Concrete Admixtures shall not apply. The packaged concrete mixture shall meet the following self-consolidating requirements:

- The slump flow range shall be 22 in. (560 mm) minimum to 28 in. (710 mm) maximum and tested according to Illinois Test Procedure SCC-2.

- The visual stability index shall be a maximum of 1 and tested according to Illinois Test Procedure SCC-2.

- The J-Ring value shall be a maximum of 2 in. (50 mm) and tested according to Illinois Test Procedure SCC-3. The L-Box blocking ratio shall be a minimum of 80 percent and tested according to Illinois Test Procedure SCC-4. The Manufacturer has the option to select either the J-Ring or L-Box test.

- The hardened visual stability index shall be a maximum of 1 and tested according to Illinois Test Procedure SCC-6.

Note 5. A packaged, pre-blended, and dry combination of materials, for the wet-mix shotcrete method shall be provided according to ASTM C 1480. An accelerator is prohibited, except the shotcrete may be modified at the nozzle with a non-chloride accelerator for overhead applications. The shotcrete shall be Type FA or CA, Grade FR, and Class I. The fibers shall be Type III synthetic according to ASTM C 1116.

The packaged shotcrete shall have a maximum water soluble chloride ion content of < 0.40 lb/cu yd (0.24 kg/cu m). The test shall be performed according to ASTM C 1218, and the hardened shotcrete shall have an age of 28 to 42 days at the time of test. The ASTM C 1218 test shall be performed by an independent lab a minimum of once every two years, and the test results shall be provided to the Department.

Each individual aggregate used in the packaged shotcrete shall have either a maximum ASTM C 1260 expansion of 0.16 percent or a maximum ASTM C 1293 expansion of 0.040 percent. However, the ASTM C 1260 value may be increased to 0.27 percent for each individual aggregate if the cement total equivalent alkali content ($Na_2O + 0.658K_2O$) does not exceed 0.60 percent. As an alternative to these requirements, ASTM C 1567 testing which shows the packaged shotcrete has a maximum expansion of 0.16 percent may be submitted. The ASTM C 1260, C 1293, or C 1567 test shall be performed a minimum of once every two years.

The 7 and 28 day compressive strength requirements in ASTM C 1480 shall not apply. Instead the shotcrete shall obtain a minimum compressive strength of 4000 psi (27,500 kPa) at 14 days.

The packaged shotcrete shall be limited to the following proportions:

The portland cement and finely divided minerals shall be 6.05 cwt/cu yd (360 kg/cu m) to 8.50 cwt/cu yd (505 kg/cu m) for Type FA and 6.05 cwt/cu yd (360 kg/cu. m) to 7.50 cwt/cu yd (445 kg/cu m) for Type CA. The portland cement shall not be below 4.70 cwt/cu yd (279 kg/cu m) for Type FA or CA.

The finely divided mineral(s) shall constitute a maximum of 35 percent of the total cement plus finely divided mineral(s).

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Class F fly ash is optional and the maximum shall be 20 percent by weight (mass) of cement.

Class C fly ash is optional and the maximum shall be 25 percent by weight (mass) of cement.

Ground granulated blast-furnace slag is optional and the maximum shall be 30 percent by weight (mass) of cement.

Microsilica is required and shall be a minimum of 5 percent by weight (mass) of cement, and a maximum of 10 percent. As an alternative to microsilica, high-reactivity metakaolin may be used at a minimum of 5 percent by weight (mass) of cement, and a maximum of 10 percent.

Fly ash shall not be used in combination with ground granulated blast-furnace slag. Class F fly ash shall not be used in combination with Class C fly ash. Microsilica shall not be used in combination with high-reactivity metakaolin. A finely divided mineral shall not be used in combination with a blended hydraulic cement, except for microsilica or high-reactivity metakaolin.

The water/cement ratio as defined in Article 1020.06 shall be a maximum of 0.42.

The air content as shot shall be 4.0 – 8.0 percent.

Note 6. In addition ASTM C 881, Type IV, Grade 2 or 3, Class A, B, or C may be used.

Equipment. Equipment shall be according to Article 503.03 and the following.

Chipping Hammer – The chipping hammer for removing concrete shall be a light-duty pneumatic or electric tool with a 15 lb. (7 kg) maximum class or less.

Blast Cleaning Equipment – Blast cleaning equipment for concrete surface preparation shall be the abrasive type, and the equipment shall have oil traps.

Hydrodemolition Equipment – Hydrodemolition equipment for removing concrete shall be calibrated, and shall use water according to Section 1002.

High Performance Shotcrete Equipment – The batching, mixing, pumping, hose, nozzle, and auxiliary equipment shall be for the wet-mix shotcrete method, and shall meet the requirements of ACI 506R.

Construction Requirements

General. The repair methods shall be either formed concrete repair or shotcrete. The repair method shall be selected by the Contractor with the following rules.

(a) Rule 1. For formed concrete repair, a subsequent patch to repair the placement point after initial concrete placement will not be allowed. As an example, this may occur in a vertical location located at the top of the repair.

(b) Rule 2. Formed concrete repair shall not be used for overhead applications.

(c) Rule 3. Shotcrete shall not be used for column repairs greater than 4 in. (100 mm) in depth, or any repair location greater than 8 in. (205 mm) in depth. The only exception to this rule would be for a horizontal application, where the shotcrete may be placed from above in one lift.

(d) Rule 4. If formed concrete repair is used for locations that have reinforcement with less than 0.75 in. (19 mm) of concrete cover, the concrete mixture shall contain fly ash or ground granulated blast-furnace slag at the maximum cement replacement allowed.

Temporary Shoring or Cribbing. When a temporary shoring or cribbing support system is required, the Contractor shall provide details and computations, prepared and sealed by an Illinois licensed Structural Engineer, to the Department for review and approval. When ever possible the support system shall be installed prior to starting the associated concrete removal. If no system is specified, but during the course of removal the need for temporary shoring or cribbing becomes apparent or is directed by the Engineer due to a structural concern, the Contractor shall not proceed with any further removal work until an appropriate and approved support system is installed.

Concrete Removal. The Contractor shall provide ladders or other appropriate equipment for the Engineer to mark the removal areas. Repair configurations will be kept simple, and squared corners will be preferred. The repair perimeter shall be sawed a depth of 1/2 in. (13 mm) or less, as required to avoid cutting the reinforcement. Any cut reinforcement shall be repaired or replaced at the expense of the Contractor. If the concrete is broken or removed beyond the limits of the initial saw cut, the new repair perimeter shall be recut. The areas to be repaired shall have all loose, unsound concrete removed completely by the use of chipping hammers, hydrodemolition equipment, or other methods approved by the Engineer. The concrete removal shall extend along the reinforcement bar until the reinforcement is free of bond inhibiting corrosion. The outermost layer of reinforcement bar within the repair area shall be undercut to a depth of 3/4 in. (19 mm) or the diameter of the reinforcement bar, whichever value is larger. The underlying transverse reinforcement bar shall also be undercut as previously described, unless the reinforcement is not corroded, and the reinforcement bar is encased and well bonded to the surrounding concrete.

If sound concrete is encountered before existing reinforcement bars are exposed, further removal of concrete shall not be performed unless the minimum repair depth is not met.

The repair depth shall be a minimum of 1 in. (25 mm). The substrate profile shall be ± 1/16 in. (± 1.5 mm). The perimeter of the repair area shall have a vertical face.

If a repair is located at the ground line, any excavation required below the ground line to complete the repair shall be included in this work.

The Contractor shall have a maximum of 14 calendar days to complete each repair location with concrete or shotcrete, once concrete removal has started for the repair.

The Engineer shall be notified of concrete removal that exceeds 6 in. (150 mm) in depth, one fourth the cross section of a structural member, more than half the vertical column reinforcement is exposed in a cross section, more than 6 consecutive reinforcement bars are exposed in any direction, within 1.5 in. (38 mm) of a bearing area, or other structural concern. Excessive deterioration or removal may require further evaluation of the structure or installation of temporary shoring and cribbing support system.

Surface Preparation. Prior to placing the concrete or shotcrete, the Contractor shall prepare the repair area and exposed reinforcement by blast cleaning. The blast cleaning shall provide a surface that is free of oil, dirt, and loose material.

If a succeeding layer of shotcrete is to be applied, the initial shotcrete surface and remaining exposed reinforcement shall be free of curing compound, oil, dirt, loose material, rebound (i.e. shotcrete material leaner than the original mixture which ricochets off the receiving surface), and overspray. Preparation may be by lightly brushing or blast cleaning if the previous shotcrete surface is less than 36 hours old. If more than 36 hours old, the surface shall be prepared by blast cleaning.

The repair area and perimeter vertical face shall have a rough surface. Care shall be taken to ensure the perimeter sawcut is roughened. Just prior to concrete or shotcrete placement, saturate the repair area with water to a saturated surface-dry condition. Any standing water shall be removed.

Concrete or shotcrete placement shall be done within 3 calendar days of the surface preparation or the repair area shall be prepared again.

Reinforcement. Exposed reinforcement bars shall be cleaned of concrete and corrosion by blast cleaning. After cleaning, all exposed reinforcement shall be carefully evaluated to determine if replacement or additional reinforcement bars are required.

Reinforcing bars that have been cut or have lost 25 percent or more of their original cross sectional area shall be supplemented by new in kind reinforcement bars. New bars shall be lapped a minimum of 32 bar diameters to existing bars. A mechanical bar splicer shall be used when it is not feasible to provide the minimum bar lap. No welding of bars shall be performed.

Intersecting reinforcement bars shall be tightly secured to each other using 0.006 in. (1.6 mm) or heavier gauge tie wire, and shall be adequately supported to minimize movement during concrete placement or application of shotcrete.

For reinforcement bar locations with less than 0.75 in. (19 mm) of cover, protective coat shall be applied to the completed repair. The application of the protective coat shall be according to Article 503.19, 2nd paragraph, except blast cleaning shall be performed to remove curing compound.

The Contractor shall anchor the new concrete to the existing concrete with 3/4 in. (19 mm) diameter hook bolts for all repair areas where the depth of concrete removal is greater than 8 in. (205 mm) and there is no existing reinforcement extending into the repair area. The hook bolts shall be spaced at 15 in. (380 mm) maximum centers both vertically and horizontally, and shall be a minimum of 12 in. (305 mm) away from the perimeter of the repair. The hook bolts shall be installed according to Section 584.

Repair Methods. All repair areas shall be inspected and approved by the Engineer prior to placement of the concrete or application of the shotcrete.

(a) Formed Concrete Repair. Falsework shall be according to Article 503.05. Forms shall be according to Article 503.06. Formwork shall provide a smooth and uniform concrete finish, and shall approximately match the existing concrete structure. Formwork shall be mortar tight and closely fitted where they adjoin the existing concrete surface to prevent leakage. Air vents may be provided to reduce voids and improve surface appearance. The Contractor may use exterior mechanical vibration, as approved by the Engineer, to release air pockets that may be entrapped.

The concrete for formed concrete repair shall be a Class SI Concrete, or a packaged R1 or R2 Mortar with coarse aggregate added, or a packaged Normal Weight Concrete at the Contractor's option. The concrete shall be placed and consolidated according to Article 503.07. The concrete shall not be placed when frost is present on the surface of the repair area, or the surface temperature of the repair area is less than 40 °F (4 °C).

All repaired members shall be restored as close as practicable to their original dimensions.

Curing shall be done according to Article 1020.13.

If temperatures below 45°F (7°C) are forecast during the curing period, protection methods shall be used. Protection Method I according to Article 1020.13(d)(1), or Protection Method II according to Article 1020.13(d)(2) shall be used during the curing period.

The surfaces of the completed repair shall be finished according to Article 503.15.

(b) Shotcrete. Shotcrete shall be tested by the Engineer for air content according to Illinois Modified AASHTO T 152. Obtain the sample in a damp, non-absorbent container from the discharge end of the nozzle.

For compressive strength of shotcrete, a 18 x 18 x 3.5 in. (457 x 457 x 89 mm) test panel shall be shot by the Contractor for testing by the Engineer. A steel form test panel shall have a minimum thickness of 3/16 in. (5 mm) for the bottom and sides. A wood form test panel shall have a minimum 3/4 in. (19 mm) thick bottom, and a minimum 1.5 in. (38 mm) thickness for the sides. The test panel shall be cured according to Article 1020.13 (a) (3) or (5) while stored at the jobsite and during delivery to the laboratory. After delivery to the laboratory for testing, curing and testing shall be according to ASTM C 1140.

The method of alignment control (i.e. ground wires, guide strips, depth gages, depth probes, and formwork) to ensure the specified shotcrete thickness and reinforcing bar cover is obtained shall be according to ACI 506R. Ground wires shall be removed after completion of cutting operations. Guide strips and formwork shall be of dimensions and a configuration that do not prevent proper application of shotcrete. Metal depth gauges shall be cut 1/4 in. (6 mm) below the finished surface. All repaired members shall be restored as close as practicable to their original dimensions.

For air temperature limits when applying shotcrete in cold weather, the first paragraph of Article 1020.14(b) shall apply. For hot weather, shotcrete shall not be applied when the air temperature is greater than 90°F (32°C). The applied shotcrete shall have a minimum temperature of 50°F (10°C) and a maximum temperature of 90°F (32°C). The shotcrete shall not be applied during periods of rain unless protective covers or enclosures are installed. The shotcrete shall not be applied when frost is present on the surface of the repair area, or the surface temperature of the repair area is less than 40°F (4°C). If necessary, lighting shall be provided to provide a clear view of the shooting area.

The shotcrete shall be applied according to ACI 506R, and shall be done in a manner that does not result in cold joints, laminations, sandy areas, voids, sags, or separations. In addition, the shotcrete shall be applied in a manner that results in maximum

densification of the shotcrete. Shotcrete which is identified as being unacceptable while still plastic shall be removed and re-applied.

The nozzle shall normally be at a distance of 2 to 5 ft. (0.6 to 1.5 m) from the receiving surface, and shall be oriented at right angles to the receiving surface. Exceptions to this requirement will be permitted to fill corners, encase large diameter reinforcing bars, or as approved by the Engineer. For any exception, the nozzle shall never be oriented more than 45 degrees from the surface. Care shall be taken to keep the front face of the reinforcement bar clean during shooting operations. Shotcrete shall be built up from behind the reinforcement bar. Accumulations of rebound and overspray shall be continuously removed prior to application of new shotcrete. Rebound material shall not be incorporated in the work.

Whenever possible, shotcrete shall be applied to the full thickness in a single layer. The maximum thickness shall be 4 in. (100 mm) unless the shotcrete is applied from above on a horizontal surface, or a thicker application is approved by the Engineer. When two or more layers are required, the minimum number shall be used and shall be done in a manner without sagging or separation. A flash coat (i.e. a thin layer of up to 1/4 in. (6 mm) applied shotcrete) may be used as the final lift for overhead applications.

Prior to application of a succeeding layer of shotcrete, the initial layer of shotcrete shall be prepared according to the surface preparation and reinforcement bar cleaning requirements. Upon completion of the surface preparation and reinforcement bar treatment, water shall be applied according to the surface preparation requirements unless the surface is moist. The second layer of shotcrete shall then be applied within 30 minutes.

Shotcrete shall be cut back to line and grade using trowels, cutting rods, screeds or other suitable devices. The shotcrete shall be allowed to stiffen sufficiently before cutting. Cutting shall not cause cracks or delaminations in the shotcrete. For depressions, cut material may be used for small areas. Rebound material shall not be incorporated in the work. For the final finish, a wood float shall be used to approximately match the existing concrete texture. All repaired members shall be restored as close as practicable to their original dimensions.

Contractor operations for curing shall be continuous with shotcrete placement and finishing operations. The Engineer may require modification of operations to ensure satisfactory results are obtained. Cotton mats shall be applied according to Article 1020.13(a)(5) except the exposed layer of shotcrete shall be covered within 10 minutes after finishing, and wet curing shall begin immediately. As an alternative to this method, Type I curing compound shall be applied according to Article 1020.13(a)(4) and moist curing with cotton mats shall begin within 3 hours. For overhead applications where the final shotcrete layer has been applied, the Contractor has the option to use Type I curing compound in lieu of the cotton mats. Note 5 of the Index Table in Article 1020.13 shall apply to the membrane curing method. The curing compound shall be applied according to Article 1020.13(a)(4).

When a shotcrete layer is to be covered by a succeeding shotcrete layer within 36 hours, the repair area shall be protected with intermittent hand fogging, or wet curing with either burlap or cotton mats shall begin within 10 minutes. Intermittent hand fogging may be used only for the first hour. Thereafter, wet curing with burlap or cotton mats shall be used until the succeeding shotcrete layer is applied. Intermittent hand fogging may be extended to the first hour and a half if the succeeding shotcrete layer is applied by the end of this time.

The curing period shall be for 7 days, except when there is a succeeding layer of shotcrete. In this instance, the initial shotcrete layer shall be cured until the surface preparation and reinforcement bar treatment is started.

If temperatures below 45°F (7°C) are forecast during the curing period, protection methods shall be used. Protection Method I according to Article 1020.13(d)(1), or Protection Method II according to Article 1020.13(d)(2) shall be used during the curing period

Inspection of Completed Work. The Contractor shall provide ladders or other appropriate equipment for the Engineer to inspect the repaired areas. After curing but no sooner than 28 days after placement of concrete or shooting of shotcrete, the repair shall be examined for conformance with original dimensions, cracks, voids, and delaminations. Sounding for delaminations will be done with a hammer or by other methods determined by the Engineer.

The repaired area shall be removed and replaced, as determined by the Engineer, for nonconformance with original dimensions, surface cracks greater than 0.01 in. (0.25 mm) in width, map cracking with a crack spacing in any direction of 18 in. (0.45 m) or less, voids, or delaminations.

If a nonconforming repair is allowed to remain in place, cracks 0.01 in. (0.25 mm) or less shall be repaired with epoxy according to Section 590. For cracks less than 0.007 in. (2 mm), the epoxy may be applied to the surface of the crack. Voids shall be repaired according to Article 503.15.

Publications and Personnel Requirements. The Contractor shall provide a current copy of ACI 506R to the Engineer a minimum of one week prior to start of construction.

The shotcrete personnel who perform the work shall have current American Concrete Institute (ACI) nozzlemen certification for vertical wet and overhead wet applications, except one individual may be in training. This individual shall be adequately supervised by a certified ACI nozzlemen as determined by the Engineer. A copy of the nozzlemen certificate(s) shall be given to the Engineer.

Method of Measurement. This work will be measured for payment in place and the area computed in square feet (square meters). For a repair at a corner, both sides will be measured.

Basis of Payment. This work will be paid for at the contract unit price per square foot (square meter) for STRUCTURAL REPAIR OF CONCRETE (DEPTH GREATER THAN 5 IN. (125 MM), STRUCTURAL REPAIR OF CONCRETE (DEPTH EQUAL TO OR LESS THAN 5 IN. (125 MM).

When not specified to be paid for elsewhere, the work to design, install, and remove the temporary shoring and cribbing will be paid for according to Article 109.04.

With the exception of reinforcement damaged by the Contractor during removal, the furnishing and installation of supplemental reinforcement bars, mechanical bar splicers, hook bolts, and protective coat will be paid according to Article 109.04.

CONSTRUCTION AIR QUALITY – DIESEL RETROFIT (BDE)

Effective: June 1, 2010
Revised: January 1, 2014

The reduction of emissions of particulate matter (PM) for off-road equipment shall be accomplished by installing retrofit emission control devices. The term "equipment" refers to diesel fuel powered devices rated at 50 hp and above, to be used on the jobsite in excess of seven calendar days over the course of the construction period on the jobsite (including rental equipment).

Contractor and subcontractor diesel powered off-road equipment assigned to the contract shall be retrofitted using the phased in approach shown below. Equipment that is of a model year older than the year given for that equipment's respective horsepower range shall be retrofitted:

Effective Dates	Horsepower Range	Model Year
June 1, 2010 1/	600-749	2002
	750 and up	2006
June 1, 2011 2/	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006
June 1, 2012 2/	50-99	2004
	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006

1/ Effective dates apply to Contractor diesel powered off-road equipment assigned to the contract.

2/ Effective dates apply to Contractor and subcontractor diesel powered off-road equipment assigned to the contract.

The retrofit emission control devices shall achieve a minimum PM emission reduction of 50 percent and shall be:

a) Included on the U.S. Environmental Protection Agency (USEPA) *Verified Retrofit Technology List* (http://www.epa.gov/cleandiesel/verification/verif-list.htm), or verified by the California Air Resources Board (CARB) (http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm); or

b) Retrofitted with a non-verified diesel retrofit emission control device if verified retrofit emission control devices are not available for equipment proposed to be used on the project, and if the Contractor has obtained a performance certification from the retrofit

device manufacturer that the emission control device provides a minimum PM emission reduction of 50 percent.

Note: Large cranes (Crawler mounted cranes) which are responsible for critical lift operations are exempt from installing retrofit emission control devices if such devices adversely affect equipment operation.

Diesel powered off-road equipment with engine ratings of 50 hp and above, which are unable to be retrofitted with verified emission control devices or if performance certifications are not available which will achieve a minimum 50 percent PM reduction, may be granted a waiver by the Department if documentation is provided showing good faith efforts were made by the Contractor to retrofit the equipment.

Construction shall not proceed until the Contractor submits a certified list of the diesel powered off-road equipment that will be used, and as necessary, retrofitted with emission control devices. The list(s) shall include (1) the equipment number, type, make, Contractor/rental company name; and (2) the emission control devices make, model, USEPA or CARB verification number, or performance certification from the retrofit device manufacturer. Equipment reported as fitted with emissions control devices shall be made available to the Engineer for visual inspection of the device installation, prior to being used on the jobsite.

The Contractor shall submit an updated list of retrofitted off-road construction equipment as retrofitted equipment changes or comes on to the jobsite. The addition or deletion of any diesel powered equipment shall be included on the updated list.

If any diesel powered off-road equipment is found to be in non-compliance with any portion of this special provision, the Engineer will issue the Contractor a diesel retrofit deficiency deduction.

Any costs associated with retrofitting any diesel powered off-road equipment with emission control devices shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed. The Contractor's compliance with this notice and any associated regulations shall not be grounds for a claim.

Diesel Retrofit Deficiency Deduction

When the Engineer determines that a diesel retrofit deficiency exists, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency continues to exist. The calendar day(s) will begin when the time period for correction is exceeded and end with the Engineer's written acceptance of the correction. The daily monetary deduction will be $1,000.00 for each deficiency identified.

The deficiency will be based on lack of diesel retrofit emissions control.

If a Contractor accumulates three diesel retrofit deficiency deductions for the same piece of equipment in a contract period, the Contractor will be shutdown until the deficiency is corrected.

Such a shutdown will not be grounds for any extension of the contract time, waiver of penalties, or be grounds for any claim.

80261

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 8 % 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.

80029

FRICTION AGGREGATE (BDE)

Effective: January 1, 2011

Revise Article 1004.01(a)(4) of the Standard Specifications to read:

"(4) Crushed Stone. Crushed stone shall be the angular fragments resulting from crushing undisturbed, consolidated deposits of rock by mechanical means. Crushed stone shall be divided into the following, when specified.

a. Carbonate Crushed Stone. Carbonate crushed stone shall be either dolomite or limestone. Dolomite shall contain 11.0 percent or more magnesium oxide (MgO). Limestone shall contain less than 11.0 percent magnesium oxide (MgO).

b. Crystalline Crushed Stone. Crystalline crushed stone shall be either metamorphic or igneous stone, including but is not limited to, quartzite, granite, rhyolite and diabase."

Revise Article 1004.03(a) of the Standard Specifications to read:

"**1004.03 Coarse Aggregate for Hot-Mix Asphalt (HMA).** The aggregate shall be according to Article 1004.01 and the following.

(a) Description. The coarse aggregate for HMA shall be according to the following table.

Use	Mixture	Aggregates Allowed
Class A	Seal or Cover	<u>Allowed Alone or in Combination:</u> Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag Crushed Concrete
HMA All Other	Stabilized Subbase or Shoulders	<u>Allowed Alone or in Combination:</u> 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-25.0, IL-19.0,
or IL-19.0L

SMA Binder</td><td><u>Allowed Alone or in Combination:</u>
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-12.5,IL-9.5,
or IL-9.5L

SMA
Ndesign 50
Surface</td><td><u>Allowed Alone or in Combination:</u>
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-12.5 or
IL-9.5

SMA
Ndesign 50
Surface</td><td><u>Allowed Alone or in Combination:</u>
Crushed Gravel
Carbonate Crushed Stone (other than Limestone)[2/]
Crystalline Crushed Stone
Crushed Sandstone
Crushed Slag (ACBF) [5/]
Crushed Steel Slag[4/ 5/]
Crushed Concrete[3/]</td></tr>
<tr><td><u>Other Combinations Allowed:</u>
<table><tr><th>Up to...</th><th>With...</th></tr><tr><td>25% Limestone</td><td>Dolomite</td></tr><tr><td>50% Limestone</td><td>Any Mixture D aggregate other than Dolomite</td></tr><tr><td>75% Limestone</td><td>Crushed Slag (ACBF)[5/] or Crushed Sandstone</td></tr></table></td></tr>
</table>

<table>
<tr><th>Use</th><th>Mixture</th><th colspan="2">Aggregates Allowed</th></tr>
<tr><td rowspan="5">HMA
High ESAL</td><td rowspan="5">E Surface
IL-12.5 or
IL-9.5

SMA
Ndesign 80
Surface</td><td colspan="2"><u>Allowed Alone or in Combination:</u>

Crushed Gravel
Crystalline Crushed Stone
Crushed Sandstone
Crushed Slag (ACBF)[5/]
Crushed Steel Slag[5/]
Crushed Concrete[3/]

No Limestone.</td></tr>
<tr><td colspan="2"><u>Other Combinations Allowed:</u></td></tr>
<tr><td>Up to...</td><td>With...</td></tr>
<tr><td>50% Dolomite[2/]</td><td>Any Mixture E aggregate</td></tr>
<tr><td>75% Dolomite[2/]</td><td>Crushed Sandstone, Crushed Slag (ACBF)[5/], Crushed Steel Slag[5/], or Crystalline Crushed Stone</td></tr>
<tr><td>75% Crushed Gravel or Crushed Concrete[3/]</td><td>Crushed Sandstone, Crystalline Crushed Stone, Crushed Slag (ACBF)[5/], or Crushed Steel Slag[5/]</td></tr>
<tr><td rowspan="4">HMA
High ESAL</td><td rowspan="4">F Surface
IL-12.5 or
IL-9.5

SMA
Ndesign 80
Surface</td><td colspan="2"><u>Allowed Alone or in Combination:</u>

Crystalline Crushed Stone
Crushed Sandstone
Crushed Slag (ACBF)[5/]
Crushed Steel Slag[5/]
No Limestone.</td></tr>
<tr><td colspan="2"><u>Other Combinations Allowed</u>:</td></tr>
<tr><td>Up to...</td><td>With...</td></tr>
<tr><td colspan="2"></td></tr>
</table>

Use	Mixture	Aggregates Allowed	
		50% Crushed Gravel, Crushed Concrete[3/], or Dolomite[2/]	Crushed Sandstone, Crushed Slag (ACBF)[5/], Crushed Steel Slag[5/], 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 either slag is used, the blend percentages listed shall be by volume."

80265

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:** _____

80229

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"

80303

HOT-MIX ASPAHLT – MIXTURE DESIGN VERIFICATION AND PRODUCTION (BDE)

Effective: November 1, 2013

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

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

"(a) High ESAL, IL-4.75 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 and All Other 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."

80323

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."

80331

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)."

80332

PORTLAND CEMENT CONCRETE EQUIPMENT (BDE)

Effective: November 1, 2013

Add the following to the first paragraph of Article 1103.03(a)(5) of the Standard Specifications to read:

> "As an alternative to a locking key, the start and finish time for mixing may be automatically printed on the batch ticket. The start and finish time shall be reported to the nearest second."

80326

PROGRESS PAYMENTS (BDE)

Effective: November 2, 2013

Revise Article 109.07(a) of the Standard Specifications to read:

"(a) Progress Payments. At least once each month, the Engineer will make a written estimate of the quantity of work performed in accordance with the contract, and the value thereof at the contract unit prices. The amount of the estimate approved as due for payment will be vouchered by the Department and presented to the State Comptroller for payment. No amount less than $1000.00 will be approved for payment other than the final payment.

Progress payments may be reduced by liens filed pursuant to Section 23(c) of the Mechanics' Lien Act, 770 ILCS 60/23(c).

If a Contractor or subcontractor has defaulted on a loan issued under the Department's Disadvantaged Business Revolving Loan Program (20 ILCS 2705/2705-610), progress payments may be reduced pursuant to the terms of that loan agreement. In such cases, the amount of the estimate related to the work performed by the Contractor or subcontractor, in default of the loan agreement, will be offset, in whole or in part, and vouchered by the Department to the Working Capital Revolving Fund or designated escrow account. Payment for the work shall be considered as issued and received by the Contractor or subcontractor on the date of the offset voucher. Further, the amount of the offset voucher shall be a credit against the Department's obligation to pay the Contractor, the Contractor's obligation to pay the subcontractor, and the Contractor's or subcontractor's total loan indebtedness to the Department. The offset shall continue until such time as the entire loan indebtedness is satisfied. The Department will notify the Contractor and Fund Control Agent in a timely manner of such offset. The Contractor or subcontractor shall not be entitled to additional payment in consideration of the offset.

The failure to perform any requirement, obligation, or term of the contract by the Contractor shall be reason for withholding any progress payments until the Department determines that compliance has been achieved."

80328

QUALITY CONTROL/QUALITY ASSURANCE OF CONCRETE MIXTURES (BDE)

Effective: January 1, 2012
Revised: January 1, 2014

Revise Note 7/ of Schedule B of Recurring Special Provision Check Sheet #31 of the Standard Specifications to read:

7/ The test of record for strength shall be the day indicated in Article 1020.04. For cement aggregate mixture II, a strength requirement is not specified and testing is not required. Additional strength testing to determine early falsework and form removal, early pavement or bridge opening to traffic, or to monitor strengths is at the discretion of the Contractor. Strength shall be defined as the average of two 6 x 12 in. (150 x 300 mm) cylinder breaks, three 4 x 8 in. (100 x 200 mm) cylinder breaks, or two beam breaks for field tests. Per Illinois Modified AASHTO T 23, cylinders shall be 6 x 12 in. (150 x 300 mm) when the nominal maximum size of the coarse aggregate exceeds 1 in. (25 mm).

80281

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."

80327

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES (BDE)

Effective: January 1, 2012
Revised: November 2, 2012

Revise Article 669.01 of the Standard Specifications to read:

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

Revise Article 669.08 of the Standard Specifications to read:

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

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

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

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

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

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

(a) Soil Analytical Results Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels exceed the most stringent maximum allowable concentration (MAC) for chemical constituents in uncontaminated soil established pursuant to Subpart F of 35 Illinois Administrative Code 1100.605, the soil shall be managed as follows:

(1) When analytical results indicate inorganic chemical constituents exceed the most stringent MAC but they are still considered within area background levels by the Engineer, the excavated soil can be utilized within the construction limits as fill, when suitable. Such soil excavated for storm sewers can be placed back into the excavated trench as backfill, when suitable, unless trench backfill is specified. If the soils cannot be utilized within the construction limits, they shall be managed and disposed of off-site as a non-special waste, special waste, or hazardous waste as applicable.

(2) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for a Metropolitan Statistical Area (MSA) County, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as "uncontaminated soil" at a CCDD facility or an uncontaminated soil fill operation within an MSA County provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.

(3) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, or the MAC within the Chicago corporate limits, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as "uncontaminated soil" at a CCDD facility or an uncontaminated soil fill operation within an MSA County excluding Chicago or within the Chicago corporate limits provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.

(4) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as "uncontaminated soil" at a CCDD facility or an uncontaminated soil fill operation within an MSA County excluding Chicago provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.

(5) When the Engineer determines soil cannot be managed according to Articles 669.09(a)(1) through (a)(4) above, the soil shall be managed and disposed of off-site as a non-special waste, special waste, or hazardous waste as applicable.

(b) Soil Analytical Results Do Not Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels do not exceed the most stringent MAC but the pH of the soil is less than 6.25 or greater than 9.0, the excavated soil can be utilized within the construction limits or managed and disposed of off-site as "uncontaminated soil" according to Article 202.03. However the excavated soil cannot be taken to a CCDD facility or an uncontaminated soil fill operation.

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

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

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

Revise Article 669.14 of the Standard Specifications to read:

"**669.14 Final Environmental Construction Report.** At the end of the project, the Contractor will prepare and submit three copies of the Environmental Construction Report on the activities conducted during the life of the project, one copy shall be submitted to the Resident Engineer, one copy shall be submitted to the District's Environmental Studies Unit, and one copy shall be submitted with an electronic copy in Adode.pdf format to the Geologic

and Waste Assessment Unit, Bureau of Design and Environment, IDOT, 2300 South Dirksen Parkway, Springfield, Illinois 62764. The technical report shall include all pertinent information regarding the project including, but not limited to:

(a) Measures taken to identify, monitor, handle, and dispose of soil or groundwater containing regulated substances, to prevent further migration of regulated substances, and to protect workers,

(b) Cost of identifying, monitoring, handling, and disposing of soil or groundwater containing regulated substances, the cost of preventing further migration of regulated substances, and the cost for worker protection from the regulated substances. All cost should be in the format of the contract pay items listed in the contract plans (identified by the preliminary environmental site investigation (PESA) site number),

(c) Plan sheets showing the areas containing the regulated substances,

(d) Field sampling and testing results used to identify the nature and extent of the regulated substances,

(e) Waste manifests (identified by the preliminary environmental site investigation (PESA) site number) for special or hazardous waste disposal, and

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

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

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

80283

REMOVAL AND DISPOSAL OF SURPLUS MATERIALS (BDE)

Effective: November 2, 2012

Revise the first four paragraphs of Article 202.03 of the Standard Specifications to read:

"**202.03 Removal and Disposal of Surplus, Unstable, Unsuitable, and Organic Materials.** Suitable excavated materials shall not be wasted without permission of the Engineer. The Contractor shall dispose of all surplus, unstable, unsuitable, and organic materials, in such a manner that public or private property will not be damaged or endangered.

Suitable earth, stones and boulders naturally occurring within the right-of-way may be placed in fills or embankments in lifts and compacted according to Section 205. Broken concrete without protruding metal bars, bricks, rock, stone, reclaimed asphalt pavement with no expansive aggregate, or uncontaminated dirt and sand generated from construction or demolition activities may be used in embankment or in fill. If used in fills or embankments, these materials shall be placed and compacted to the satisfaction of the Engineer; shall be buried under a minimum of 2 ft (600 mm) of earth cover (except when the materials include only uncontaminated dirt); and shall not create an unsightly appearance or detract from the natural topographic features of an area. Broken concrete without protruding metal bars, bricks, rock, or stone may be used as riprap as approved by the Engineer. If the materials are used for fill in locations within the right-of-way but outside project construction limits, the Contractor must specify to the Engineer, in writing, how the landscape restoration of the fill areas will be accomplished. Placement of fill in such areas shall not commence until the Contractor's landscape restoration plan is approved by the Engineer.

Aside from the materials listed above, all other construction and demolition debris or waste shall be disposed of in a licensed landfill, recycled, reused, or otherwise disposed of as allowed by State or Federal laws and regulations. When the Contractor chooses to dispose of uncontaminated soil at a clean construction and demolition debris (CCDD) facility or at an uncontaminated soil fill operation, it shall be the Contractor's responsibility to have the pH of the material tested to ensure the value is between 6.25 and 9.0, inclusive. A copy of the pH test results shall be provided to the Engineer.

A permit shall be obtained from IEPA and made available to the Engineer prior to open burning of organic materials (i.e., plant refuse resulting from pruning or removal of trees or shrubs) or other construction or demolition debris. Organic materials originating within the right-of-way limits may be chipped or shredded and placed as mulch around landscape plantings within the right-of-way when approved by the Engineer. Chipped or shredded material to be placed as mulch shall not exceed a depth of 6 in. (150 mm)."

80319

SEEDING (BDE)

Effective: November 1, 2012

Revise the following seeding mixture shown in Table 1 of Article 250.07 of the Standard Specifications to read.

"TABLE 1 - SEEDING MIXTURES		
Class - Type	Seeds	lb/acre (kg/hectare)
3 Northern Illinois Slope Mixture 7/	Elymus Canadensis (Canada Wild Rye) 5/	5 (5)
	Perennial Ryegrass	20 (20)
	Alsike Clover 2/	5 (5)
	Desmanthus Illinoensis (Illinois Bundleflower) 2/, 5/	2 (2)
	Andropogon Scoparius (Little Bluestem) 5/	12 (12)
	Bouteloua Curtipendula (Side-Oats Grama) 5/	10 (10)
	Fult Salt Grass 1/	30 (35)
	Oats, Spring	50 (55)
	Slender Wheat Grass 5/	15 (15)
	Buffalo Grass (Cody or Bowie) 4/, 5/, 9/	5 (5)"

80307

STEEL COST ADJUSTMENT (BDE) (RETURN FORM WITH BID)

Effective: April 2, 2004
Revised: April 1, 2009

Description. Steel cost adjustments will be made to provide additional compensation to the Contractor, or a credit to the Department, for fluctuations in steel prices when optioned by the Contractor. The bidder shall indicate on the attached form whether or not this special provision will be part of the contract and submit the completed form with his/her bid. Failure to submit the form or failure to indicate contract number, company name, and sign and date the form shall make this contract exempt of steel cost adjustments for all items of steel. Failure to indicate "Yes" for any item of work will make that item of steel exempt from steel cost adjustment.

Types of Steel Products. An adjustment will be made for fluctuations in the cost of steel used in the manufacture of the following items:

Metal Piling (excluding temporary sheet piling)
Structural Steel
Reinforcing Steel

Other steel materials such as dowel bars, tie bars, mesh reinforcement, guardrail, steel traffic signal and light poles, towers and mast arms, metal railings (excluding wire fence), and frames and grates will be subject to a steel cost adjustment when the pay items they are used in has a contract value of $10,000 or greater.

Documentation. Sufficient documentation shall be furnished to the Engineer to verify the following:

(a) The dates and quantity of steel, in lb (kg), shipped from the mill to the fabricator.

(b) The quantity of steel, in lb (kg), incorporated into the various items of work covered by this special provision. The Department reserves the right to verify submitted quantities.

Method of Adjustment. Steel cost adjustments will be computed as follows:

$SCA = Q \times D$

Where: SCA = steel cost adjustment, in dollars
Q = quantity of steel incorporated into the work, in lb (kg)
D = price factor, in dollars per lb (kg)

$D = MPI_M - MPI_L$

Where: MPI_M = The Materials Cost Index for steel as published by the Engineering News-Record for the month the steel is shipped from the mill. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

MPI_L = The Materials Cost Index for steel as published by the Engineering News-Record for the month prior to the letting. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

The unit weights (masses) of steel that will be used to calculate the steel cost adjustment for the various items are shown in the attached table.

No steel cost adjustment will be made for any products manufactured from steel having a mill shipping date prior to the letting date.

If the Contractor fails to provide the required documentation, the method of adjustment will be calculated as described above; however, the MPI_M will be based on the date the steel arrives at the job site. In this case, an adjustment will only be made when there is a decrease in steel costs.

Basis of Payment. Steel cost adjustments may be positive or negative but will only be made when there is a difference between the MPI_L and MPI_M in excess of five percent, as calculated by:

$$\text{Percent Difference} = \{(MPI_L - MPI_M) \div MPI_L\} \times 100$$

Steel cost adjustments will be calculated by the Engineer and will be paid or deducted when all other contract requirements for the items of work are satisfied. Adjustments will only be made for fluctuations in the cost of the steel as described herein. No adjustment will be made for changes in the cost of manufacturing, fabrication, shipping, storage, etc.

The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

Attachment

Item	Unit Mass (Weight)
Metal Piling (excluding temporary sheet piling)	
Furnishing Metal Pile Shells 12 in. (305 mm), 0.179 in. (3.80 mm) wall thickness)	23 lb/ft (34 kg/m)
Furnishing Metal Pile Shells 12 in. (305 mm), 0.250 in. (6.35 mm) wall thickness)	32 lb/ft (48 kg/m)
Furnishing Metal Pile Shells 14 in. (356 mm), 0.250 in. (6.35 mm) wall thickness)	37 lb/ft (55 kg/m)
Other piling	See plans
Structural Steel	See plans for weights (masses)
Reinforcing Steel	See plans for weights (masses)
Dowel Bars and Tie Bars	6 lb (3 kg) each
Mesh Reinforcement	63 lb/100 sq ft (310 kg/sq m)
Guardrail	
Steel Plate Beam Guardrail, Type A w/steel posts	20 lb/ft (30 kg/m)
Steel Plate Beam Guardrail, Type B w/steel posts	30 lb/ft (45 kg/m)
Steel Plate Beam Guardrail, Types A and B w/wood posts	8 lb/ft (12 kg/m)
Steel Plate Beam Guardrail, Type 2	305 lb (140 kg) each
Steel Plate Beam Guardrail, Type 6	1260 lb (570 kg) each
Traffic Barrier Terminal, Type 1 Special (Tangent)	730 lb (330 kg) each
Traffic Barrier Terminal, Type 1 Special (Flared)	410 lb (185 kg) each
Steel Traffic Signal and Light Poles, Towers and Mast Arms	
Traffic Signal Post	11 lb/ft (16 kg/m)
Light Pole, Tenon Mount and Twin Mount, 30 - 40 ft (9 – 12 m)	14 lb/ft (21 kg/m)
Light Pole, Tenon Mount and Twin Mount, 45 - 55 ft (13.5 – 16.5 m)	21 lb/ft (31 kg/m)
Light Pole w/Mast Arm, 30 - 50 ft (9 – 15.2 m)	13 lb/ft (19 kg/m)
Light Pole w/Mast Arm, 55 - 60 ft (16.5 – 18 m)	19 lb/ft (28 kg/m)
Light Tower w/Luminaire Mount, 80 - 110 ft (24 – 33.5 m)	31 lb/ft (46 kg/m)
Light Tower w/Luminaire Mount, 120 - 140 ft (36.5 – 42.5 m)	65 lb/ft (97 kg/m)
Light Tower w/Luminaire Mount, 150 - 160 ft (45.5 – 48.5 m)	80 lb/ft (119 kg/m)
Metal Railings (excluding wire fence)	
Steel Railing, Type SM	64 lb/ft (95 kg/m)
Steel Railing, Type S-1	39 lb/ft (58 kg/m)
Steel Railing, Type T-1	53 lb/ft (79 kg/m)
Steel Bridge Rail	52 lb/ft (77 kg/m)
Frames and Grates	
Frame	250 lb (115 kg)
Lids and Grates	150 lb (70 kg)

Return With Bid

ILLINOIS DEPARTMENT OF TRANSPORTATION

OPTION FOR STEEL COST ADJUSTMENT

The bidder shall submit this completed form with his/her bid. Failure to submit the form or properly complete contract number, company name, and sign and date the form shall make this contract exempt of steel cost adjustments for all items of steel. Failure to indicate "Yes" for any item of work will make that item of steel exempt from steel cost adjustment. After award, this form, when submitted shall become part of the contract.

Contract No.: _____

Company Name:_____

Contractor's Option:

Is your company opting to include this special provision as part of the contract plans for the following items of work?

Metal Piling	Yes	☐
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:** _____

80127

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"."

80301

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012

The Contractor shall provide a weekly report of Disadvantaged Business Enterprise (DBE) trucks hired by the Contractor or subcontractors (i.e. not owned by the Contractor or subcontractors) that are used on the jobsite; or used for the delivery and/or removal of equipment/material to and from the jobsite. The jobsite shall also include offsite locations, such as plant sites or storage sites, when those locations are used solely for this contract.

The report shall be submitted on the form provided by the Department within ten business days following the reporting period. The reporting period shall be Monday through Sunday for each week reportable trucking activities occur. The report shall be submitted to the Engineer and a copy shall be provided to the district EEO Officer.

Any costs associated with providing weekly DBE trucking reports shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

80302

ILLINOIS DEPARTMENT OF LABOR

PREVAILING WAGES FOR MCHENRY COUNTY EFFECTIVE FEBRUARY 2014

The Prevailing rates of wages are included in the Contract proposals which are subject to Check Sheet #5 of the Supplemental Specifications and Recurring Special Provisions. The rates have been ascertained and certified by the Illinois Department of Labor for the locality in which the work is to be performed and for each craft or type of work or mechanic needed to execute the work of the Contract. As required by Prevailing Wage Act (820 ILCS 130/0.01, et seq.) and Check Sheet #5 of the Contract, not less than the rates of wages ascertained by the Illinois Department of Labor and as revised during the performance of a Contract shall be paid to all laborers, workers and mechanics performing work under the Contract. Post the scale of wages in a prominent and easily accessible place at the site of work.

If the Illinois Department of Labor revises the prevailing rates of wages to be paid as listed in the specification of rates, the contractor shall post the revised rates of wages and shall pay not less than the revised rates of wages. Current wage rate information shall be obtained by visiting the Illinois Department of Labor web site at http://www.state.il.us/agency/idol/ or by calling 312-793-2814. It is the responsibility of the contractor to review the rates applicable to the work of the contract at regular intervals in order to insure the timely payment of current rates. Provision of this information to the contractor by means of the Illinois Department of Labor web site satisfies the notification of revisions by the Department to the contractor pursuant to the Act, and the contractor agrees that no additional notice is required. The contractor shall notify each of its subcontractors of the revised rates of wages.

Mchenry County Prevailing Wage for February 2014

(See explanation of column headings at bottom of wages)

Trade Name	RG	TYP	C	Base	FRMAN	M-F>8	OSA	OSH	H/W	Pensn	Vac	Trng
ASBESTOS ABT-GEN		ALL		37.100	37.600	1.5	1.5	2.0	12.97	9.930	0.000	0.500
ASBESTOS ABT-MEC		BLD		35.100	37.600	1.5	1.5	2.0	11.17	10.76	0.000	0.720
BOILERMAKER		BLD		44.240	48.220	2.0	2.0	2.0	6.970	16.92	0.000	0.350
BRICK MASON		BLD		41.580	45.740	1.5	1.5	2.0	9.700	12.80	0.000	1.040
CARPENTER		ALL		42.520	44.520	1.5	1.5	2.0	13.29	12.76	0.000	0.630
CEMENT MASON		ALL		41.550	43.550	2.0	1.5	2.0	9.500	15.87	0.000	0.500
CERAMIC TILE FNSHER		BLD		34.810	0.000	2.0	1.5	2.0	10.20	7.830	0.000	0.640
COMMUNICATION TECH		BLD		36.360	38.460	1.5	1.5	2.0	12.27	10.25	0.000	0.640
ELECTRIC PWR EQMT OP		ALL		36.610	49.750	1.5	1.5	2.0	5.000	11.35	0.000	0.270
ELECTRIC PWR GRNDMAN		ALL		28.310	49.750	1.5	1.5	2.0	5.000	8.780	0.000	0.210
ELECTRIC PWR LINEMAN		ALL		43.830	49.750	1.5	1.5	2.0	5.000	13.58	0.000	0.330
ELECTRIC PWR TRK DRV		ALL		29.310	49.750	1.5	1.5	2.0	5.000	9.090	0.000	0.220
ELECTRICIAN		ALL		43.330	47.660	1.5	1.5	2.0	12.78	12.22	0.000	0.760
ELEVATOR CONSTRUCTOR		BLD		49.900	56.140	2.0	2.0	2.0	12.73	13.46	3.990	0.600
FENCE ERECTOR	E	ALL		34.840	36.840	1.5	1.5	2.0	12.86	10.67	0.000	0.300
FENCE ERECTOR	S	ALL		45.060	48.660	2.0	2.0	2.0	9.390	17.69	0.000	0.400
GLAZIER		BLD		40.000	41.500	1.5	2.0	2.0	12.49	15.99	0.000	0.940
HT/FROST INSULATOR		BLD		46.950	49.450	1.5	1.5	2.0	11.17	11.96	0.000	0.720
IRON WORKER	E	ALL		42.070	44.070	2.0	2.0	2.0	13.45	19.59	0.000	0.350
IRON WORKER	S	ALL		45.060	48.660	2.0	2.0	2.0	9.390	17.69	0.000	0.400
IRON WORKER	W	ALL		35.090	36.840	2.0	2.0	2.0	8.340	22.19	0.000	0.500
LABORER		ALL		37.000	37.750	1.5	1.5	2.0	12.97	9.930	0.000	0.500
LATHER		ALL		42.520	44.520	1.5	1.5	2.0	13.29	12.76	0.000	0.630
MACHINIST		BLD		43.920	46.420	1.5	1.5	2.0	6.760	8.950	1.850	0.000
MARBLE FINISHERS		ALL		30.520	0.000	1.5	1.5	2.0	9.700	12.55	0.000	0.590
MARBLE MASON		BLD		40.780	44.860	1.5	1.5	2.0	9.700	12.71	0.000	0.740
MATERIAL TESTER I		ALL		27.000	0.000	1.5	1.5	2.0	12.97	9.930	0.000	0.500
MATERIALS TESTER II		ALL		32.000	0.000	1.5	1.5	2.0	12.97	9.930	0.000	0.500
MILLWRIGHT		ALL		42.520	44.520	1.5	1.5	2.0	13.29	12.76	0.000	0.630
OPERATING ENGINEER		BLD	1	46.100	50.100	2.0	2.0	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		BLD	2	44.800	50.100	2.0	2.0	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		BLD	3	42.250	50.100	2.0	2.0	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		BLD	4	40.500	50.100	2.0	2.0	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		BLD	5	49.850	50.100	2.0	2.0	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		BLD	6	47.100	50.100	2.0	2.0	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		BLD	7	49.100	50.100	2.0	2.0	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		HWY	1	44.300	48.300	1.5	1.5	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		HWY	2	43.750	48.300	1.5	1.5	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		HWY	3	41.700	48.300	1.5	1.5	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		HWY	4	40.300	48.300	1.5	1.5	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		HWY	5	39.100	48.300	1.5	1.5	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		HWY	6	47.300	48.300	1.5	1.5	2.0	16.60	11.05	1.900	1.250
OPERATING ENGINEER		HWY	7	45.300	48.300	1.5	1.5	2.0	16.60	11.05	1.900	1.250
ORNAMNTL IRON WORKER	E	ALL		42.900	45.400	2.0	2.0	2.0	13.11	16.40	0.000	0.600
ORNAMNTL IRON WORKER	S	ALL		45.060	48.660	2.0	2.0	2.0	9.390	17.69	0.000	0.400
PAINTER		ALL		40.980	42.980	1.5	1.5	1.5	10.00	8.200	0.000	1.350
PAINTER SIGNS		BLD		33.920	38.090	1.5	1.5	1.5	2.600	2.710	0.000	0.000
PILEDRIVER		ALL		42.520	44.520	1.5	1.5	2.0	13.29	12.76	0.000	0.630
PIPEFITTER		BLD		46.000	49.000	1.5	1.5	2.0	9.000	15.85	0.000	1.680
PLASTERER		BLD		41.250	43.730	1.5	1.5	2.0	11.10	11.69	0.000	0.550
PLUMBER		BLD		44.500	47.500	1.5	1.5	2.0	11.05	12.40	0.000	1.700
ROOFER		BLD		39.200	42.200	1.5	1.5	2.0	8.280	9.690	0.000	0.430
SHEETMETAL WORKER		BLD		43.250	45.250	1.5	1.5	2.0	10.65	12.90	0.000	0.820
SIGN HANGER		BLD		26.070	27.570	1.5	1.5	2.0	3.800	3.550	0.000	0.000
SPRINKLER FITTER		BLD		49.200	51.200	1.5	1.5	2.0	10.75	8.850	0.000	0.450

STEEL ERECTOR	E	ALL		42.070	44.070	2.0	2.0	2.0	13.45	19.59	0.000	0.350
STEEL ERECTOR	S	ALL		45.060	48.660	2.0	2.0	2.0	9.390	17.69	0.000	0.400
STONE MASON		BLD		41.580	45.740	1.5	1.5	2.0	9.700	12.80	0.000	1.040
SURVEY WORKER		ALL		37.000	37.750	1.5	1.5	2.0	12.97	9.930	0.000	0.500
TERRAZZO FINISHER		BLD		36.040	0.000	1.5	1.5	2.0	10.20	9.900	0.000	0.540
TERRAZZO MASON		BLD		39.880	42.880	1.5	1.5	2.0	10.20	11.25	0.000	0.700
TILE MASON		BLD		41.840	45.840	2.0	1.5	2.0	10.20	9.560	0.000	0.880
TRAFFIC SAFETY WRKR		HWY		28.250	29.850	1.5	1.5	2.0	4.896	4.175	0.000	0.000
TRUCK DRIVER		ALL	1	35.850	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TRUCK DRIVER		ALL	2	36.000	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TRUCK DRIVER		ALL	3	36.200	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TRUCK DRIVER		ALL	4	36.400	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TUCKPOINTER		BLD		41.950	42.950	1.5	1.5	2.0	8.180	11.78	0.000	0.630

Legend:

RG (Region)
TYP (Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers)
C (Class)
Base (Base Wage Rate)
FRMAN (Foreman Rate)
M-F>8 (OT required for any hour greater than 8 worked each day, Mon through Fri.
OSA (Overtime (OT) is required for every hour worked on Saturday)
OSH (Overtime is required for every hour worked on Sunday and Holidays)
H/W (Health & Welfare Insurance)
Pensn (Pension)
Vac (Vacation)
Trng (Training)

Explanations

MCHENRY COUNTY

FENCE ERECTOR (EAST) - That part of the county East and Northeast of a line following Route 31 North to Route 14, northwest to Route 47 north to the Wisconsin State Line.

IRONWORKERS (EAST) - That part of the county East of Rts. 47 and 14.

IRONWORKERS (SOUTH) - That part of the county South of Route 14 and East of Route 47.

IRONWORKERS (WEST) - That part of the county West of Route 47.

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER

The grouting, cleaning, and polishing of all classes of tile, whether for interior or exterior purposes, all burned, glazed or unglazed products; all composition materials, granite tiles, warning detectable tiles, cement tiles, epoxy composite materials, pavers, glass, mosaics, fiberglass, and all substitute materials, for tile made in tile-like units; all mixtures in tile like form of cement, metals, and other materials that are for and intended for use as a finished floor surface, stair treads, promenade roofs, walks, walls, ceilings, swimming pools, and all other places where tile is to form a finished interior or exterior. The mixing of all setting mortars including but not limited to thin-set mortars, epoxies, wall mud, and any other sand and cement mixtures or adhesives when used in the preparation, installation, repair, or maintenance of tile and/or similar materials. The handling and unloading of all sand, cement, lime, tile, fixtures, equipment, adhesives, or any other materials to be used in the preparation, installation, repair, or maintenance of tile and/or similar materials. Ceramic Tile Finishers shall fill all joints and voids regardless of method on all tile work, particularly and especially after installation of said tile work. Application of any and all protective coverings to all types of tile installations including, but not be limited to, all soap compounds, paper products, tapes, and all polyethylene coverings, plywood, masonite, cardboard, and any new type of products that may be used to protect tile installations, Blastrac equipment, and all floor scarifying equipment used in preparing floors to receive tile. The clean up and removal of all waste and materials. All demolition of existing tile floors and walls to be re-tiled.

COMMUNICATIONS TECHNICIAN

Construction, installation, maintenance and removal of telecommunication facilities (voice, sound, data and video), telephone, security systems, fire alarm systems that are a component of a multiplex system and share a common cable, and data inside wire, interconnect, terminal equipment, central offices, PABX and equipment, micro waves, V-SAT, bypass, CATV, WAN (wide area network), LAN (local area networks), and ISDN (integrated system digital network), pulling of wire in raceways, but not the installation of raceways.

MARBLE FINISHER

Loading and unloading trucks, distribution of all materials (all stone, sand, etc.), stocking of floors with material, performing all rigging for heavy work, the handling of all material that may be needed for the installation of such materials, building of scaffolding, polishing if needed, patching, waxing of material if damaged, pointing up, caulking, grouting and cleaning of marble, holding water on diamond or Carborundum blade or saw for setters cutting, use of tub saw or any other saw needed for preparation of material, drilling of holes for wires that anchor material set by setters, mixing up of molding plaster for installation of material, mixing up thin set for the installation of material, mixing up of sand to cement for the installation of material and such other work as may be required in helping a Marble Setter in the handling of all material in the erection or installation of interior marble, slate,

travertine, art marble, serpentine, alberene stone, blue stone, granite and other stones (meaning as to stone any foreign or domestic materials as are specified and used in building interiors and exteriors and customarily known as stone in the trade), carrara, sanionyx, vitrolite and similar opaque glass and the laying of all marble tile, terrazzo tile, slate tile and precast tile, steps, risers treads, base, or any other materials that may be used as substitutes for any of the aforementioned materials and which are used on interior and exterior which are installed in a similar manner.

MATERIAL TESTER I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

MATERIAL TESTER II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEER - BUILDING

Class 1. Asphalt Plant; Asphalt Spreader; Autograde; Backhoes with Caisson Attachment; Batch Plant; Benoto (requires Two Engineers); Boiler and Throttle Valve; Caisson Rigs; Central Redi-Mix Plant; Combination Back Hoe Front End-loader Machine; Compressor and Throttle Valve; Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Conveyor (Truck Mounted); Concrete Paver Over 27E cu. ft; Concrete Paver 27E cu. ft. and Under: Concrete Placer; Concrete Placing Boom; Concrete Pump (Truck Mounted); Concrete Tower; Cranes, All; Cranes, Hammerhead; Cranes, (GCI and similar Type); Creter Crane; Spider Crane; Crusher, Stone, etc.; Derricks, All; Derricks, Traveling; Formless Curb and Gutter Machine; Grader, Elevating; Grouting Machines; Heavy Duty Self-Propelled Transporter or Prime Mover; Highlift Shovels or Front Endloader 2-1/4 yd. and over; Hoists, Elevators, outside type rack and pinion and similar machines; Hoists, One, Two and Three Drum; Hoists, Two Tugger One Floor; Hydraulic Backhoes; Hydraulic Boom Trucks; Hydro Vac (and similar equipment); Locomotives, All; Motor Patrol; Lubrication Technician; Manipulators; Pile Drivers and Skid Rig; Post Hole Digger; Pre-Stress Machine; Pump Cretes Dual Ram; Pump Cretes: Squeeze Cretes-Screw Type Pumps; Gypsum Bulker and Pump; Raised and Blind Hole Drill; Roto Mill Grinder; Scoops - Tractor Drawn; Slip-Form Paver; Straddle Buggies; Operation of Tie Back Machine; Tournapull; Tractor with Boom and Side Boom; Trenching Machines.

Class 2. Boilers; Broom, All Power Propelled; Bulldozers; Concrete Mixer (Two Bag and Over); Conveyor, Portable; Forklift Trucks; Highlift Shovels or Front Endloaders under 2-1/4 yd.; Hoists, Automatic; Hoists, Inside Elevators; Hoists, Sewer Dragging Machine; Hoists, Tugger Single Drum; Laser Screed; Rock Drill (Self-Propelled); Rock Drill (Truck Mounted); Rollers, All; Steam Generators; Tractors, All; Tractor Drawn Vibratory Roller; Winch Trucks with "A" Frame.

Class 3. Air Compressor; Combination Small Equipment Operator; Generators; Heaters, Mechanical; Hoists, Inside Elevators (remodeling or renovation work); Hydraulic Power Units (Pile Driving, Extracting, and Drilling); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Low Boys; Pumps, Well Points; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 4. Bobcats and/or other Skid Steer Loaders; Oilers; and Brick Forklift.

Class 5. Assistant Craft Foreman.

Class 6. Gradall.

Class 7. Mechanics; Welders.

OPERATING ENGINEERS - HIGHWAY CONSTRUCTION

Class 1. Asphalt Plant; Asphalt Heater and Planer Combination; Asphalt Heater Scarfire; Asphalt Spreader; Autograder/GOMACO or other similar type machines: ABG Paver; Backhoes with Caisson Attachment; Ballast Regulator; Belt Loader; Caisson Rigs; Car Dumper; Central Redi-Mix Plant; Combination Backhoe Front Endloader Machine, (1 cu. yd. Backhoe Bucket or over or with attachments); Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Paver over 27E cu. ft.; Concrete Placer; Concrete Tube Float; Cranes, all attachments; Cranes, Tower Cranes of all types: Creter Crane: Spider Crane; Crusher, Stone, etc.; Derricks, All; Derrick Boats; Derricks, Traveling; Dredges; Elevators, Outside type Rack & Pinion and Similar Machines; Formless Curb and Gutter Machine; Grader, Elevating; Grader, Motor Grader, Motor Patrol, Auto Patrol, Form Grader, Pull Grader, Subgrader; Guard Rail Post Driver Truck Mounted; Hoists, One, Two and Three Drum; Heavy Duty Self-Propelled Transporter or Prime Mover; Hydraulic Backhoes; Backhoes with shear attachments up to 40' of boom reach; Lubrication Technician; Manipulators; Mucking Machine; Pile Drivers and Skid Rig; Pre-Stress Machine; Pump Cretes Dual Ram; Rock Drill - Crawler or Skid Rig; Rock Drill - Truck Mounted; Rock/Track Tamper; Roto Mill Grinder; Slip-Form Paver; Snow Melters; Soil Test Drill Rig (Truck Mounted); Straddle Buggies; Hydraulic Telescoping Form (Tunnel); Operation of Tieback Machine; Tractor Drawn Belt Loader; Tractor Drawn Belt Loader (with attached pusher - two engineers); Tractor with Boom; Tractaire with Attachments; Traffic Barrier Transfer Machine; Trenching; Truck Mounted Concrete Pump with Boom; Raised or Blind Hole Drills (Tunnel Shaft); Underground Boring and/or Mining Machines 5 ft. in diameter and over tunnel, etc; Underground Boring and/or Mining Machines under 5 ft. in diameter; Wheel Excavator; Widener (APSCO).

Class 2. Batch Plant; Bituminous Mixer; Boiler and Throttle Valve; Bulldozers; Car Loader Trailing Conveyors; Combination Backhoe Front Endloader Machine (Less than 1 cu. yd. Backhoe Bucket or over or with attachments); Compressor and Throttle Valve; Compressor, Common Receiver (3); Concrete Breaker or Hydro Hammer; Concrete Grinding Machine; Concrete Mixer or Paver 7S Series to and including 27 cu. ft.; Concrete Spreader; Concrete Curing Machine, Burlap Machine, Belting Machine and Sealing Machine; Concrete Wheel Saw; Conveyor Muck Cars (Haglund or Similar Type); Drills, All; Finishing Machine - Concrete; Highlift Shovels or Front Endloader; Hoist - Sewer Dragging Machine; Hydraulic Boom Trucks (All Attachments); Hydro-Blaster; Hydro Excavating (excluding hose work); Laser Screed; All Locomotives, Dinky; Off-Road Hauling Units (including articulating) Non Self-Loading Ejection Dump; Pump Cretes: Squeeze Cretes - Screw Type Pumps, Gypsum Bulker and Pump; Roller, Asphalt; Rotary Snow Plows; Rototiller, Seaman, etc., self-propelled; Self-Propelled Compactor; Spreader - Chip - Stone, etc.; Scraper - Single/Twin Engine/Push and Pull; Scraper - Prime Mover in Tandem (Regardless of Size); Tractors pulling attachments, Sheeps Foot, Disc, Compactor, etc.; Tug Boats.

Class 3. Boilers; Brooms, All Power Propelled; Cement Supply Tender; Compressor, Common Receiver (2); Concrete Mixer (Two Bag and Over); Conveyor, Portable; Farm-Type Tractors Used for Mowing, Seeding, etc.; Forklift Trucks; Grouting Machine; Hoists, Automatic; Hoists, All

Elevators; Hoists, Tugger Single Drum; Jeep Diggers; Low Boys; Pipe Jacking Machines; Post-Hole Digger; Power Saw, Concrete Power Driven; Pug Mills; Rollers, other than Asphalt; Seed and Straw Blower; Steam Generators; Stump Machine; Winch Trucks with "A" Frame; Work Boats; Tamper-Form-Motor Driven.

Class 4. Air Compressor; Combination - Small Equipment Operator; Directional Boring Machine; Generators; Heaters, Mechanical; Hydraulic Power Unit (Pile Driving, Extracting, or Drilling); Light Plants, All (1 through 5); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Pumps, Well Points; Vacuum Trucks (excluding hose work); Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 5. SkidSteer Loader (all); Brick Forklifts; Oilers.

Class 6. Field Mechanics and Field Welders

Class 7. Dowell Machine with Air Compressor; Gradall and machines of like nature.

SURVEY WORKER - Operated survey equipment including data collectors, G.P.S. and robotic instruments, as well as conventional levels and transits.

TRAFFIC SAFETY - work associated with barricades, horses and drums used to reduce lane usage on highway work, the installation and removal of temporary lane markings, and the installation and removal of temporary road signs.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION

Class 1. Two or three Axle Trucks. A-frame Truck when used for transportation purposes; Air Compressors and Welding Machines, including those pulled by cars, pick-up trucks and tractors; Ambulances; Batch Gate Lockers; Batch Hopperman; Car and Truck Washers; Carry-alls; Fork Lifts and Hoisters; Helpers; Mechanics Helpers and Greasers; Oil Distributors 2-man operation; Pavement Breakers; Pole Trailer, up to 40 feet; Power Mower Tractors; Self-propelled Chip Spreader; Skipman; Slurry Trucks, 2-man operation; Slurry Truck Conveyor Operation, 2 or 3 man; Teamsters; Unskilled Dumpman; and Truck Drivers hauling warning lights, barricades, and portable toilets on the job site.

Class 2. Four axle trucks; Dump Crets and Adgetors under 7 yards; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnapulls or Turnatrailers when pulling other than self-loading equipment or similar equipment under 16 cubic yards; Mixer Trucks under 7 yeards; Ready-mix Plant Hopper Operator, and Winch Trucks, 2 Axles.

Class 3. Five axle trucks; Dump Crets and Adgetors 7 yards and over; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnatrailers or turnapulls when pulling other than self-loading equipment or similar equipment over 16 cubic yards; Explosives and/or Fission Material Trucks; Mixer Trucks 7 yards or over; Mobile Cranes while in transit; Oil Distributors, 1-man operation; Pole Trailer, over 40 feet; Pole and Expandable Trailers hauling material over 50 feet long; Slurry trucks, 1-man operation; Winch trucks, 3 axles or more; Mechanic--Truck Welder and Truck Painter.

Class 4. Six axle trucks; Dual-purpose vehicles, such as mounted crane trucks with hoist and accessories; Foreman; Master Mechanic; Self-loading equipment like P.B. and trucks with scoops on the front.

TERRAZZO FINISHER

The handling of sand, cement, marble chips, and all other materials that may be used by the Mosaic Terrazzo Mechanic, and the mixing, grinding, grouting, cleaning and sealing of all Marble, Mosaic, and Terrazzo work, floors, base, stairs, and wainscoting by hand or machine, and in addition, assisting and aiding Marble, Masonic, and Terrazzo Mechanics.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

MATERIAL TESTER & MATERIAL TESTER/INSPECTOR I AND II

Notwithstanding the difference in the classification title, the classification entitled "Material Tester I" involves the same job duties as the classification entitled "Material Tester/Inspector I". Likewise, the classification entitled "Material Tester II" involves the same job duties as the classification entitled "Material Tester/Inspector II".