

HIGHWAY WORK PROPOSAL

Wisconsin Department of Transportation
DT1502 10/2010 s.66.29(7) Wis. Stats.

Proposal Number:

14

COUNTY	STATE PROJECT ID	FEDERAL PROJECT ID	PROJECT DESCRIPTION	HIGHWAY
Milwaukee	1060-34-73		Zoo IC, DPW Site Facilities Milwaukee Co DPW Site	USH 45

This proposal, submitted by the undersigned bidder to the Wisconsin Department of Transportation, is in accordance with the advertised request for proposals. The bidder is to furnish and deliver all materials, and to perform all work for the improvement of the designated project in the time specified, in accordance with the appended Proposal Requirements and Conditions.

Proposal Guaranty Required, \$ 320,000.00 Payable to: Wisconsin Department of Transportation	Attach Proposal Guaranty on back of this PAGE.
Bid Submittal Due Date: March 10, 2015 Time (Local Time): 9:00 AM	Firm Name, Address, City, State, Zip Code
Contract Completion Time May 20, 2016	SAMPLE NOT FOR BIDDING PURPOSES
Assigned Disadvantaged Business Enterprise Goal 0%	This contract is exempt from federal oversight.

This certifies that the undersigned bidder, duly sworn, is an authorized representative of the firm named above; that the bidder has examined and carefully prepared the bid from the plans, Highway Work Proposal, and all addenda, and has checked the same in detail before submitting this proposal or bid; and that the bidder or agents, officer, or employees have not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this proposal bid.

Do not sign, notarize, or submit this Highway Work Proposal when submitting an electronic bid on the Internet.

Subscribed and sworn to before me this date _____

(Signature, Notary Public, State of Wisconsin)

(Print or Type Name, Notary Public, State Wisconsin)

(Date Commission Expires)

Notary Seal

(Bidder Signature)

(Print or Type Bidder Name)

(Bidder Title)

For Department Use Only

Type of Work Removals, grading, dense graded base, concrete pavement, concrete curb and gutter, concrete sidewalk, HMA pavement, storm sewer, sanitary sewer, water main, erosion control, permanent signing, pavement marking, lighting, electrical, buildings.	Date Guaranty Returned
Notice of Award Dated	

**PLEASE ATTACH
PROPOSAL GUARANTY HERE**

Effective with November 2007 Letting

PROPOSAL REQUIREMENTS AND CONDITIONS

The bidder, signing and submitting this proposal, agrees and declares as a condition thereof, to be bound by the following conditions and requirements.

If the bidder has a corporate relationship with the proposal design engineering company, the bidder declares that it did not obtain any facts, data, or other information related to this proposal from the design engineering company that was not available to all bidders.

The bidder declares that they have carefully examined the site of, and the proposal, plans, specifications and contract forms for the work contemplated, and it is assumed that the bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and quantities of work to be performed and materials to be furnished, and as to the requirements of the specifications, special provisions and contract. It is mutually agreed that submission of a proposal shall be considered conclusive evidence that the bidder has made such examination.

The bidder submits herewith a proposal guaranty in proper form and amount payable to the party as designated in the advertisement inviting proposals, to be retained by and become the property of the owner of the work in the event the undersigned shall fail to execute the contract and contract bond and return the same to the office of the engineer within fourteen (14) days after having been notified in writing to do so; otherwise to be returned.

The bidder declares that they understand that the estimate of quantities in the attached schedule is approximate only and that the attached quantities may be greater or less in accordance with the specifications.

The bidder agrees to perform the said work, for and in consideration of the payment of the amount becoming due on account of work performed, according to the unit prices bid in the following schedule, and to accept such amounts in full payment of said work.

The bidder declares that all of the said work will be performed at their own proper cost and expense, that they will furnish all necessary materials, labor, tools, machinery, apparatus, and other means of construction in the manner provided in the applicable specifications and the approved plans for the work together with all standard and special designs that may be designed on such plans, and the special provisions in the contract of which this proposal will become a part, if and when accepted. The bidder further agrees that the applicable specifications and all plans and working drawings are made a part hereof, as fully and completely as if attached hereto.

The bidder, if awarded the contract, agrees to begin the work not later than ten (10) days after the date of written notification from the engineer to do so, unless otherwise stipulated in the special provisions.

The bidder declares that if they are awarded the contract, they will execute the contract agreement and begin and complete the work within the time named herein, and they will file a good and sufficient surety bond for the amount of the contract for performance and also for the full amount of the contract for payment.

The bidder, if awarded the contract, shall pay all claims as required by Section 779.14, Statutes of Wisconsin, and shall be subject to and discharge all liabilities for injuries pursuant to Chapter 102 of the Statutes of Wisconsin, and all acts amendatory thereto. They shall further be responsible for any damages to property or injury to persons occurring through their own negligence or that of their employees or agents, incident to the performance of work under this contract, pursuant to the Standard Specifications for Road and Bridge Construction applicable to this contract.

In connection with the performance of work under this contract, the contractor agrees to comply with all applicable state and federal statutes relating to non-discrimination in employment. No otherwise qualified person shall be excluded from employment or otherwise be subject to discrimination in employment in any manner on the basis of age, race, religion, color, gender, national origin or ancestry, disability, arrest or conviction record (in keeping with s.111.32), sexual orientation, marital status, membership in the military reserve, honesty testing, genetic testing, and outside use of lawful products. This provision shall include, but not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation, and selection for training, including apprenticeship. The contractor further agrees to ensure equal opportunity in employment to all applicants and employees and to take affirmative action to attain a representative workforce.

The contractor agrees to post notices and posters setting forth the provisions of the nondiscrimination clause, in a conspicuous and easily accessible place, available for employees and applicants for employment.

If a state public official (section 19.42, Stats.) or an organization in which a state public official holds at least a 10% interest is a party to this agreement, this contract is voidable by the state unless appropriate disclosure is made to the State of Wisconsin Ethics Board.

BID PREPARATION

Preparing the Proposal Schedule of Items

A General

- (1) Obtain bidding proposals as specified in **section 102** of the standard specifications prior to 11:45 AM of the last business day preceding the letting. Submit bidding proposals using one of the following methods:
 1. Electronic bid on the internet.
 2. Electronic bid on a printout with accompanying diskette or CD ROM.
 3. Paper bid under a waiver of the electronic submittal requirements.
- (2) Bids submitted on a printout with accompanying diskette or CD ROM or paper bids submitted under a waiver of the electronic submittal requirements govern over bids submitted on the internet.
- (3) The department will provide bidding information through the department's web site at <http://www.dot.wisconsin.gov/business/engrserv/bid-letting-information.htm>. The contractor is responsible for reviewing this web site for general notices as well as information regarding proposals in each letting. The department will also post special notices of all addenda to each proposal through this web site no later than 4:00 P.M. local time on the Thursday before the letting. Check the department's web site after 5:00 P.M. local time on the Thursday before the letting to ensure all addenda have been accounted for before preparing the bid. When bidding using methods 1 and 2 above, check the Bid Express™ on-line bidding exchange at <http://www.bidx.com/> after 5:00 P.M. local time on the Thursday before the letting to ensure that the latest schedule of items Expedite file (*.ebs or *.00x) is used to submit the final bid.
- (4) Interested parties can subscribe to the Bid Express™ on-line bidding exchange by following the instructions provided at the www.bidx.com web site or by contacting:

Info Tech Inc.
5700 SW 34th Street, Suite 1235
Gainesville, FL 32608-5371
email: <mailto:customer.support@bidx.com>

- (5) The department will address equipment and process failures, if the bidder can demonstrate that those failures were beyond their control.
- (6) Contractors are responsible for checking on the issuance of addenda and for obtaining the addenda. Notice of issuance of addenda is posted on the department's web site at <http://www.dot.wisconsin.gov/business/engrserv/bid-letting-information.htm> or by calling the department at (608) 266-1631. Addenda can ONLY be obtained from the departments web site listed above or by picking up the addenda at the Bureau of Highway Construction, Room 601, 4802 Sheboygan Avenue, Madison, WI, during regular business hours.

B Submitting Electronic Bids

B.1 On the Internet

- (1) Do the following before submitting the bid:
 1. Have a properly executed annual bid bond on file with the department.
 2. Have a digital ID on file with and enabled by Info Tech Inc. Using this digital ID will constitute the bidder's signature for proper execution of the bidding proposal.
- (2) In lieu of preparing, delivering, and submitting the proposal as specified in **102.6** and **102.9** of the standard specifications, submit the proposal on the internet as follows:

1. Download the latest schedule of items reflecting all addenda from the Bid Express™ web site.
 2. Use Expedite™ software to enter a unit price for every item in the schedule of items.
 3. Submit the bid according to the requirements of Expedite™ software and the Bid Express™ web site. Do not submit a bid on a printout with accompanying diskette or CD ROM or a paper bid. If the bidder does submit a bid on a printout with accompanying diskette or a paper bid in addition to the internet submittal, the department will disregard the internet bid.
 4. Submit the bid before the hour and date the Notice to Contractors designates.
 5. Do not sign, notarize, and return the bidding proposal described in 102.2 of the standard specifications.
- (3) The department will not consider the bid accepted until the hour and date the Notice to Contractors designates.

B.2 On a Printout with Accompanying Diskette or CD ROM

- (1) Download the latest schedule of items from the Wisconsin pages of the Bid Express™ web site reflecting the latest addenda posted on the department's web site at <http://www.dot.wisconsin.gov/business/engrserv/bid-letting-information.htm>. Use Expedite™ software to prepare and print the schedule of items. Provide a valid amount for all price fields. Follow instructions and review the help screens provided on the Bid Express™ web site to assure that the schedule of items is prepared properly.
- (2) Staple an 8 1/2 by 11 inch printout of the Expedite™ generated schedule of items to the other proposal documents submitted to the department as a part of the bidder's sealed bid. As a separate submittal not in the sealed bid envelop but due at the same time and place as the sealed bid, also provide the Expedite™ generated schedule of items on a 3 1/2 inch computer diskette or CD ROM. Label each diskette or CD ROM with the bidder's name, the 4 character department-assigned bidder identification code from the top of the bidding proposal, and a list of the proposal numbers included on that diskette or CD ROM as indicated in the following example:

Bidder Name

BN00

Proposals: 1, 12, 14, & 22

- (3) If bidding on more than one proposal in the letting, the bidder may include all proposals for that letting on one diskette or CD ROM. Include only submitted proposals with no incomplete or other files on the diskette or CD ROM.
- (4) The bidder-submitted printout of the Expedite™ generated schedule of items is the governing contract document and must conform to the requirements of section 102 of the standard specifications. If a printout needs to be altered, cross out the printed information with ink or typewriter and enter the new information and initial it in ink. If there is a discrepancy between the printout and the diskette or CD ROM, the department will analyze the bid using the printout information.
- (5) In addition to the reasons specified in section 102 of the standard specifications, proposals are irregular and the department may reject them for one or more of the following:
 1. The check code printed on the bottom of the printout of the Expedite™ generated schedule of items is not the same on each page.
 2. The check code printed on the printout of the Expedite™ generated schedule of items is not the same as the check code for that proposal provided on the diskette or CD ROM.

3. The diskette or CD ROM is not submitted at the time and place the department designates.

C Waiver of Electronic Submittal

- (1) The bidder may request a waiver of the electronic submittal requirements. Submit a written request for a waiver in lieu of bids submitted on the internet or on a printout with accompanying diskette or CD ROM. Use the waiver that was included with the paper bid document sent to the bidder or type up a waiver on the bidder's letterhead. The department will waive the electronic submittal requirements for a bidding entity (individual, partnership, joint venture, corporation, or limited liability company) for up to 4 individual proposals in a calendar year. The department may allow additional waivers for equipment malfunctions.
- (2) Submit a schedule of items on paper conforming to [section 102](#) of the standard specifications. The department charges the bidder a \$75 administrative fee per proposal, payable at the time and place the department designates for receiving bids, to cover the costs of data entry. The department will accept a check or money order payable to: "Wisconsin, Dept. of Transportation."
- (3) In addition to the reasons specified in [section 102](#) of the standard specifications, proposals are irregular and the department may reject them for one or more of the following:
 1. The bidder fails to provide the written request for waiver of the electronic submittal requirements.
 2. The bidder fails to pay the \$75 administrative fee before the time the department designates for the opening of bids unless the bidder requests on the waiver that they be billed for the \$75.
 3. The bidder exceeds 4 waivers of electronic submittal requirements within a calendar year.
- (4) In addition to the reasons specified in [section 102](#) of the standard specifications, the department may refuse to issue bidding proposals for future contracts to a bidding entity that owes the department administrative fees for a waiver of electronic submittal requirements.

PROPOSAL BID BOND

DT1303 1/2006

Wisconsin Department of Transportation

Proposal Number	Project Number	Letting Date
Name of Principal		
Name of Surety	State in Which Surety is Organized	

We, the above-named Principal and the above-named Surety, are held and firmly bound unto the State of Wisconsin in the sum equal to the Proposal Guaranty for the total bid submitted for the payment to be made; we jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns. The condition of this obligation is that the Principal has submitted a bid proposal to the State of Wisconsin acting through the Department of Transportation for the improvement designated by the Proposal Number and Letting Date indicated above.

If the Principal is awarded the contract and, within the time and manner required by law after the prescribed forms are presented for signature, enters into a written contract in accordance with the bid, and files the bond with the Department of Transportation to guarantee faithful performance and payment for labor and materials, as required by law, or if the Department of Transportation shall reject all bids for the work described, then this obligation shall be null and void; otherwise, it shall be and remain in full force and effect. In the event of failure of the Principal to enter into the contract or give the specified bond, the Principal shall pay to the Department of Transportation **within 10 business days of demand** a total equal to the Proposal Guaranty as liquidated damages; the liability of the Surety continues for the full amount of the obligation as stated until the obligation is paid in full.

The Surety, for value received, agrees that the obligations of it and its bond shall not be impaired or affected by any extension of time within which the Department of Transportation may accept the bid; and the Surety does waive notice of any such extension.

IN WITNESS, the Principal and Surety have agreed and have signed by their proper officers and have caused their corporate seals to be affixed this date: **(DATE MUST BE ENTERED)**

PRINCIPAL

(Company Name) **(Affix Corporate Seal)**

(Signature and Title)

(Company Name)

(Signature and Title)

(Company Name)

(Signature and Title)

(Company Name)

(Signature and Title)

NOTARY FOR PRINCIPAL

(Date)

State of Wisconsin)
) ss.
_____ County)

On the above date, this instrument was acknowledged before me by the named person(s).

(Signature, Notary Public, State of Wisconsin)

(Print or Type Name, Notary Public, State of Wisconsin)

(Date Commission Expires)

Notary Seal

(Name of Surety) **(Affix Seal)**

(Signature of Attorney-in-Fact)

NOTARY FOR SURETY

(Date)

State of Wisconsin)
) ss.
_____ County)

On the above date, this instrument was acknowledged before me by the named person(s).

(Signature, Notary Public, State of Wisconsin)

(Print or Type Name, Notary Public, State of Wisconsin)

(Date Commission Expires)

Notary Seal

IMPORTANT: A certified copy of Power of Attorney of the signatory agent must be attached to the bid bond.

CERTIFICATE OF ANNUAL BID BOND

DT1305 8/2003

Wisconsin Department of Transportation

Time Period Valid (From/To)	
Name of Surety	
Name of Contractor	
Certificate Holder	Wisconsin Department of Transportation

This is to certify that an annual bid bond issued by the above-named Surety is currently on file with the Wisconsin Department of Transportation.

This certificate is issued as a matter of information and conveys no rights upon the certificate holder and does not amend, extend or alter the coverage of the annual bid bond.

Cancellation: Should the above policy be cancelled before the expiration date, the issuing surety will give thirty (30) days written notice to the certificate holder indicated above.

(Signature of Authorized Contractor Representative)

(Date)

March 2010

LIST OF SUBCONTRACTORS

Section 66.0901(7), Wisconsin Statutes, provides that as a part of the proposal, the bidder also shall submit a list of the subcontractors the bidder proposes to contract with and the class of work to be performed by each. In order to qualify for inclusion in the bidder's list a subcontractor shall first submit a bid in writing, to the general contractor at least 48 hours prior to the time of the bid closing. The list may not be added to or altered without the written consent of the municipality. A proposal of a bidder is not invalid if any subcontractor and the class of work to be performed by the subcontractor has been omitted from a proposal; the omission shall be considered inadvertent or the bidder will perform the work personally.

No subcontract, whether listed herein or later proposed, may be entered into without the written consent of the Engineer as provided in Subsection 108.1 of the Standard Specifications.

[illegible]

DECEMBER 2000

**CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER
RESPONSIBILITY MATTERS - PRIMARY COVERED TRANSACTIONS**

Instructions for Certification

1. By signing and submitting this proposal, the prospective contractor is providing the certification set out below.
2. The inability of a person to provide the certification required below will not necessarily result in denial of participation in this covered transaction. The prospective contractor shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective contractor to furnish a certification or an explanation shall disqualify such person from participation in this transaction.
3. The certification in this clause is a material representation of fact upon which reliance was placed when the department determined to enter into this transaction. If it is later determined that the contractor knowingly rendered an erroneous certification in addition to other remedies available to the Federal Government the department may terminate this transaction for cause or default.
4. The prospective contractor shall provide immediate written notice to the department to whom this proposal is submitted if at any time the prospective contractor learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
5. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the department to which this proposal is being submitted for assistance in obtaining a copy of those regulations.
6. The prospective contractor agrees by submitting this proposal that, should this contract be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department entering into this transaction.
7. The prospective contractor further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," which is included as an addendum to PR-1273 - "Required Contract Provisions Federal Aid Construction Contracts," without

modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

8. The contractor may rely upon a certification of a prospective subcontractor/materials supplier that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A contractor may decide the method and frequency by which it determines the eligibility of its principals. Each contractor may, but is not required to, check the Disapproval List (telephone # 608/266/1631).
9. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
10. Except for transactions authorized under paragraph 6 of these instructions, if a contractor in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department may terminate this transaction for cause or default.

Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions

- (1) The prospective contractor certifies to the best of its knowledge and belief, that it and its principals:
 - (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements or receiving stolen property;
 - (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offense enumerated in paragraph (1)(b) of this certification; and
 - (d) Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- (2) Where the prospective contractor is unable to certify to any of the statements in this certification, such prospective contractor shall attach an explanation to this proposal.

Special Provisions

Table of Contents

Article	Description	Page #
1.	General.....	4
2.	Scope of Work.	4
3.	Waiving Bidder Prequalification.	4
4.	Prosecution and Progress.	4
5.	Mandatory Pre-Bid Meeting.	6
6.	Traffic.	7
7.	Holiday Work Restrictions.	7
8.	Utilities.....	8
9.	Municipality Acceptance of Sanitary Sewer and Water Main Construction.	16
10.	Referenced Construction Specifications.	17
11.	Other Contracts.	17
12.	Hauling Restrictions.....	17
13.	Environmental Protection and Erosion Control.	17
14.	Public Convenience and Safety.	18
15.	Notice to Contractor – Airport Operating Restrictions.	18
16.	Notice to Contractor – Access to Site.	19
17.	Public Involvement Meetings.	19
18.	Material and Equipment Staging.	19
19.	3D Model Data.....	19
20.	Work Force Opportunities.	20
21.	Available Documents.....	20
22.	Geotechnical Investigation Information.	21
23.	Contractor Notification.	21
24.	Contractor Document Submittals.....	22
25.	Information to Bidders, Use of Recovered Material.....	22
26.	Labor Compliance Reporting – Payroll Requirements.	22
27.	Dust Control Implementation Plan.	23
28.	Project Site Air Quality.....	25
29.	Owner Controlled Insurance Program.	26
30.	Subletting the Contract.	38
31.	CPM Progress Schedule.....	38
32.	Pay Plan Quantity.	39
33.	Force Account.....	39
34.	Pavement Breaking Equipment.....	39
35.	Removing or Abandoning Miscellaneous Structures.	40
36.	Concrete Maturity Testing.	40
37.	Field Facilities.....	41
38.	QMP Base Aggregate.	41
39.	QMP HMA Pavement Nuclear Density.....	49
40.	Erosion Control.....	56

41.	Maintaining Drainage.....	57
42.	Deep Pipe Installation.....	58
43.	Control of Water.....	58
44.	Furnishing and Planting Plant Materials.....	58
45.	Landscape Planting Surveillance and Care Cycles.....	59
46.	Gates Chain Link (40 Feet), Item 616.0329.0001; Gates Chain Link (50 Feet), Item 616.0329.0002.....	59
47.	Lighting Control Cabinets 240/480 30-Inch, Item 659.2230.....	59
48.	EBS Excavation, Item SPV.0035.0100.....	59
49.	EBS Backfill, Item SPV.0035.0101.....	61
50.	Inlet Covers Type 57, Item SPV.0060.0001.....	62
51.	Inlet Covers Type R Special, Item SPV.0060.0002.....	62
52.	Removing Sanitary Manholes, Item SPV.0060.0004.....	63
53.	Reconstructing Sanitary Manholes, Item SPV. 0060.0005.....	64
54.	Adjusting Sanitary Manholes, Item SPV.0060.0006.....	65
55.	Connecting Sanitary Lateral 6-inch, Item SPV.0060.0007.....	67
56.	Removing Existing Foundation, Item SPV.0060.0010.....	68
57.	Installing County Furnished Keypad, Item SPV.0060.0011.....	69
58.	Parking Lot Bollard, Item SPV.0060.0019.....	69
59.	Mayfair Pond Outlet Storm Sewer Structure Reconstruction, Item SPV.0060.0020.....	70
60.	Removing and Stockpiling Light Poles, Arms and Luminares, Item SPV.0060.0021.....	71
61.	Conveyor, Item SPV.0060.0101.....	72
62.	Installing State Furnished Bike Rack, Item SPV.0060.0102.....	76
63.	Gabion Pillars, Item SPV.0060.7001.....	77
64.	Hydrant Assembly, Item SPV.0060.7101.....	78
65.	Butterfly Valve, 12-Inch, Item SPV.0060.7102.....	80
66.	Resilient Wedge Gate Valve, 8-Inch, Item SPV.0060.7103; Resilient Wedge Gate Valve, 6-Inch, Item SPV.0060.7104.....	82
67.	Cut and Cap Water Main, Item SPV.0060.7105.....	83
68.	Removing Hydrant, Item SPV.0060.7106.....	84
69.	Hydrant Assembly Relocation, Item SPV.0060.7107.....	85
70.	Air Release Valve 2-Inch, Item SPV.0060.7108.....	87
71.	Abandon Valve Boxes, Item SPV.0060.7109.....	87
72.	Adjusting Valve Boxes, Item SPV.0060.7110.....	88
73.	Adjusting Hydrant, Item SPV.0060.7111.....	89
74.	Removing Water Valve, Item SPV.0060.7112.....	90
75.	No Mow Fescue Grass Seed, Item SPV.0085.7001.....	91
76.	Concrete Curb and Gutter 6-Inch Sloped 31-Inch, Item SPV.0090.0001.....	92
77.	Removing Sanitary Sewer, Item SPV.0090.0002.....	93
78.	Storm Sewer Pipe Corrugated High Density Polyethylene (HDPE) 12-Inch, Item SPV.0090.0009.....	94
79.	Storm Sewer PVC SDR 35 6-Inch, Item SPV.0090.0011; Storm Sewer PVC SDR 35 8-Inch, Item SPV.0090.0012; Storm Sewer PVC SDR 35 10-Inch, Item SPV.0090.0013.....	96

80.	Electrical Wire Lighting 500 KCMIL, Item SPV.0090.1035.....	97
81.	Poly Edging Material, Item SPV.0090.7001.	98
82.	Decorative Steel Fence, Item SPV.0090.7002.....	99
83.	Green Screen Fence, Item SPV.0090.7003.....	99
84.	Ductile Iron (DI), Class 55 Water Main, 12-Inch, Item SPV.0090.7101; Ductile Iron (DI), Class 55 Water Main, 8-Inch, Item SPV.0090.7102.....	100
85.	Copper Water Service, 2-Inch, Item SPV.0090.7103.	107
86.	Survey Project 1060-34-73, Item SPV.0105.0001.....	108
87.	Pavement Cleanup Project 1060-34-73, Item SPV.0105.0002.....	110
88.	Moving Salt, Item SPV.0105.0003.....	111
89.	Moving State-Owned Materials, Item SPV.0105.0004.	112
90.	Static Scale System, SPV.0105.0005.....	112
91.	Removing Former Sheriff's Building Structure, Item SPV.0105.0006.....	116
92.	Salt Dome, Item SPV.0105.0101.....	121
93.	Storage Building 1, Item SPV.0105.0102; Storage Building 2, Item SPV.0105.0103; Salt Brine Building, Item SPV.0105.0104; Bins, Item SPV.0105.0105.	134
94.	Dewatering Catch Basin, SPV.0105.0106.....	241
95.	Common Electrical Work Storage Building 1, Item SPV.0105.1025; Common Electrical Work Storage Building 2, Item SPV.0105.1026; Common Electrical Work Salt Brine Building, Item SPV.0105.1027.....	263
96.	Insulation Board Polystyrene, 4-Inch, Item SPV.0180.0001.....	294
97.	Topsoil Special, Item SPV.0180.0007.....	295
98.	Management of Solid Waste, Item SPV.0195.0001.	297
99.	River Stone, Item SPV.0195.7001.....	303

SPECIAL PROVISIONS

1. General.

Perform the work under this construction contract for Project 1060-34-73, Zoo IC, DPW Site Facilities, Milwaukee Co DPW Site, USH 45, Milwaukee County, Wisconsin as the plans show and execute the work as specified in the State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, 2015 Edition, as published by the department, and these special provisions.

If all or a portion of the plans and special provisions are developed in the SI metric system and the schedule of prices is developed in the US standard measure system, the department will pay for the work as bid in the US standard system.

100-005 (20140630)

2. Scope of Work.

The work under this contract shall consist of removals, grading, dense graded base, concrete pavement, concrete curb and gutter, concrete sidewalk, HMA pavement, storm sewer, sanitary sewer, water main, erosion control, permanent signing, pavement marking, lighting, electrical, buildings, and all incidental items necessary to complete the work as shown on the plans and included in the proposal and contract.

104-005 (20090901)

3. Waiving Bidder Prequalification.

Bidder prequalification is not required; however, prior to awarding a contract, the department may require the bidder to produce financial documentation similar to the prequalification statement (DT1621) and evidence that they have a history of performing work of a similar character in a satisfactory manner.

4. Prosecution and Progress.

Begin work within ten calendar days after the engineer issues a written notice to do so.

Provide the start date to the engineer in writing within a month after executing the contract but at least 14 calendar days before the preconstruction conference. Upon approval, the engineer will issue the notice to proceed within ten calendar days before the approved start date.

To revise the start date, submit a written request to the engineer at least two weeks before the intended start date. The engineer will approve or deny that request based on the conditions cited in the request and its effect on the department's scheduled resources.

The department will not grant time extensions to the interim completion dates specified above for the following:

- Severe weather as specified in standard spec 108.10.2.2.
- Labor disputes that are not industry wide.
- Delays in material deliveries.

Schedule of Operations

The department anticipates that the schedule of operations in this contract shall be as follows, unless modifications are approved in writing by the engineer. Provide at least 100 parking spaces throughout the duration of the project.

Stage 1: April 2015 to June 2015

Construct permanent salt storage

Stage 2: June 2015

Relocate salt from the temporary storage shed to the salt dome. Relocate the salt prior to August 15, 2015.

Stage 3: July 2015

Construct storage buildings, dewatering catch basin, bins, and a portion of the fleet maintenance yard as shown in the “Staged Construction” plans.

Stage 4: July 2015

Relocate temporary materials.

Stage 5: August 2015

Construct park and ride lot. Park and ride lot shall be fully operational prior to September 1, 2015.

Stage 6: April 2016 to May 2016

Construct a portion of the facilities parking lot.

Stage 7: May 2016

Construct the remaining portion of the facilities parking lot.

Interim Completion of Work

Modify standard spec 108.11 by adding the following to the end:

Each day is defined as a twenty-four hour period beginning at 12:01 AM.

Interim Completion of Work 8/15/2015

Complete all work necessary to move all existing salt to the new salt dome prior to 12:01 AM August 15, 2015.

If the contractor fails to complete the work necessary to move all existing salt to the new salt dome, and remove all materials from the temporary shed prior to 12:01 AM August 15, 2015, the department will assess the contractor \$1,810 in interim liquidated damages for each calendar day that all of the existing salt has not been moved to the new salt dome after 12:01 AM, August 15, 2015. An entire calendar day will be charged for any period of time within a calendar day that the work remains incomplete beyond 12:01 AM.

Interim Completion of Work 9/1/2015

Complete all work necessary to open the park and ride to traffic prior to 12:01 AM September 1, 2015.

If the contractor fails to complete the work necessary to open the park and ride to traffic prior to 12:01 AM September 1, 2015, the department will assess the contractor \$1,810 in interim liquidated damages for each calendar day that the park and ride remains closed after 12:01 AM, August 15, 2015. An entire calendar day will be charged for any period of time within a calendar day that the park and ride remains closed beyond 12:01 AM.

5. Mandatory Pre-Bid Meeting.

Supplement standard spec 102.3.1 with the following:

Prospective bidders are required to attend a mandatory pre-bid meeting on March 3, 2015 from 1:00 PM at 10190 Watertown Plank Road. Wauwatosa, WI 53226 (Milwaukee County DPW existing temporary salt dome).

In case of inclement weather, a secondary meeting room has been reserved at the Zoo Interchange Field Office (Fox Room), 2424 S 102nd St., West Allis. Please contact Jeff Bohlen at (414) 750-2928, with any questions.

The meeting agenda will include the following:

- Corridor Overview
- Zoo Interchange – DPW Site Improvements

The meeting will discuss project specific issues for IDs 1060-34-73.

- The Owner Controlled Insurance Program (OCIP)

The Zoo Interchange project will be constructed under the umbrella of an Owner Controlled Insurance Program (OCIP). Contractor/Consultant participation in this Corridor Project is mandatory and requires enrollment into the OCIP.

This meeting will provide understanding of the coverage provided by the OCIP, the bid deduction process and the coverage needed outside of the OCIP. It is critical that CFO's, Risk Manager/Insurance Broker or Agent, and Estimators attend this meeting.

Please contact Kay Millonzi at (608) 267-7722, or kay.millonzi@dot.wi.gov with any questions regarding the OCIP.

- Safety
- Contractor Compliance
- Interim Completion Dates
- State-Owned and County material movement requirements and final location of materials
- Salt movement from the temporary to permanent location
- County Furnished Keypads – Vendor Information
- Existing Buildings to be removed – by others
- Trash Rack
- Work done by others
- Fleet vehicles
- Inspection of water work
- DBE Business Outreach Provision

No meeting minutes will be prepared. A published response will be sent out addressing all questions raised at the meeting.

6. Traffic.

General

Keep Watertown Plank Road and Swan Boulevard open to traffic at all times for the duration of this project. Keep internal DPW roadways open to traffic for Milwaukee County Maintenance staff, Milwaukee County Sheriff's and guests.

7. Holiday Work Restrictions.

Do not perform work on, nor haul materials of any kind along or across any portion of the highway carrying Swan Boulevard, Watertown Plank Road or Mayfair Road traffic, and entirely clear the traveled way and shoulders of such portions of the highway of equipment, barricades, signs, lights, and any other material that might impede the free flow of traffic during the following holiday periods:

- From noon Friday, May 22, 2015 to 6:00 AM Tuesday, May 26, 2015 for Memorial Day;
- From noon Thursday, July 2, 2015 to 6:00 AM Monday, July 6, 2015 for Independence Day;

- From noon Friday, September 4, 2015 to 6:00 AM Tuesday, September 8, 2015 for Labor Day;
- From noon Wednesday, November 25, 2015 to 6:00 AM Monday, November 30, 2015 for Thanksgiving;
- From noon Wednesday, December 23, 2015 to 6:00 AM Monday, December 28, 2015 for Christmas;
- From noon Friday, May 27, 2016 to 6:00 AM Tuesday, May 31, 2016 for Memorial Day.

107-005 (20050502)

8. Utilities.

This contract comes under the provisions of Administrative Rule TRANS 220.

Additional information regarding recently relocated utility facilities may be available on permits issued to the utility companies. These permits can be viewed at the Region Office during normal working hours. Contact WisDOT SE Freeways Utility Coordinator Douglas Gendron at (414) 750-4362 for further information.

Underground and overhead utility facilities are located within the project limits. Utility adjustments are required for this construction project as noted below. Coordinate construction activities with a call to Diggers Hotline or a direct call to the utilities that have facilities in the area as required per state statute. Use caution to ensure the integrity of underground facilities and maintain code clearances from overhead facilities at all times.

Some utility work, as described below, is dependent on prior work being performed by the contractor at a specific site. Provide the engineer and the affected utility a good faith notice of when the utility is to start work at the site. Notice shall be given 14 to 16 calendar days in advance of when the site will be available to the utility. Follow up with a confirmation notice to the engineer and the utility not less than 3 working days before the site will be ready for the utility to begin its work.

Contact utility companies listed in the plans prior to preparing bids to obtain current information on existing utility locations and the status of any new utility relocation work.

Utility companies will be performing utility work and adjustments within the limits and during the life of the project. The contractor shall cooperate and coordinate construction activities with these companies.

There may be abandoned utility facilities within the project limits. If a conflict with an abandoned utility facility is encountered, contact the appropriate utility owner/representative to coordinate construction activities and proper removal and disposal of said facility as necessary.

Utility working days shown herein are as defined in Wisconsin Administrative Code Chapter Trans 220.

Known utilities in the project limits are as follows:

American Transmission Company has an overhead 138kv electric transmission line beginning beyond the westerly project limits and running easterly to a pole at Station 8PR+10, 415'LT. From there the line continues easterly to a pole at Station 29NSR+08, 0'LT where it turns and runs northeasterly to across USH 45 to beyond the project limits. This line will remain in place without adjustment.

Coordinate construction activities with ATC. Due to outage constraints for the multi-state electric grid, these transmission lines cannot be de-energized during construction. Use caution when operating overhead equipment in this area and maintain OSHA safe working clearance to the overhead conductors at all times. Notify ATC 48 hours before beginning any work within or around overhead electric transmission lines.

Contact Jim Briggs, (414) 651-1830, of American Transmission Company 7 days in advance to coordinate locations and any excavation near their facilities.

AT&T Wisconsin has overhead and underground communication facilities within the project limits in the following locations:

- An underground communications line beginning beyond the southerly project limits and running northerly across Watertown Plank Road and ending at a pole at Station 1PR+43, 7'LT. AT&T will relocate the pole to Station 1PR+24, 6'LT and abandon the underground line in place north of the new pole location prior to construction.
- An overhead communications line beginning at a pole at Station 1PR+43, 7'LT and running northerly and ending at a pole at Station 9PR+34, 19'LT. AT&T will reconstruct this overhead line beginning at a pole at Station 1PR+24, 6'LT and running northerly to the existing pole at Station 9PR+34, 19'LT prior to construction.
- An underground communications line beginning at a pole at Station 9PR+34, 19'LT and running southeasterly to Station 8PR+92, 161'RT where it turns and runs northeasterly to beyond the northerly project limits. This line will remain in place without adjustment.
- An underground communications line beginning at a pole at Station 9PR+34, 19'LT and running southeasterly to Station 21NSR+36, 47'LT where it turns and runs easterly to Station 23NSR+19, 43'LT. From there the line turns and runs northerly to Station 23NSR+40, 235'LT where it turns and runs easterly and ends at a pedestal at Station 23NSR+85, 243'LT. AT&T will abandon this line in place prior to construction.

Contact Jay Bulanek, (414) 535-7407 office, of AT&T Wisconsin 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee, County – Electrical and Communications has abandoned underground communication facilities within the project limits in the following locations:

- An abandoned communications line beginning beyond the southerly project limits and running northerly across Watertown Plank Road to Station 50ESR+98, 29'RT where it continues northerly to Station 52ESR+47, 32'RT. From there the line runs easterly to Station 52ESR+56, 110'RT where it turns and runs northerly into the County Sheriff Substation Building.
- An abandoned communications line beginning at the northeast corner of the County Fleet Maintenance Building and running northerly and ending at Station 26NSR+67, 36'LT.
- An abandoned communications line beginning at the northeast corner of the County Fleet Maintenance Building and running northerly to Station 26NSR+82, 323'LT where it turns and runs northwesterly to Station 26NSR+19, 394'LT. From there the line runs northwesterly to Station 23NSR+75, 445'LT and then continues northwesterly to beyond the project limits.
- An abandoned communications line beginning at the north wall of the County Fleet Maintenance Building at Station 24NSR+14, 78'RT and running northwesterly to Station 23NSR+54, 48'LT. From there the line runs northerly and northeasterly to Station 23NSR+96, 489'LT where it turns and runs southeasterly to Station 24NSR+45, 479'LT. From there the line runs northeasterly to Station 24NSR+82, 600'LT where it turns and runs northwesterly to beyond the project limits.

Contact Thomas Travia, (414) 257-6418 office / (414) 339-0408 cell, of Milwaukee County 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee, County – Sanitary has underground sanitary sewer facilities within the project limits in the following locations:

- An underground sanitary sewer beginning beyond the westerly project limits and running easterly along the north side of Watertown Plank Road, crossing Swan Boulevard at Station 167BV+01, and continuing easterly to a manhole at Station 50ESR+89, 14'LT where it turns and runs northerly to a manhole at Station 53ESR+11, 14'LT. From there it turns and runs easterly to a manhole at Station 53ESR+14, 41'RT where it turns and runs northerly to a manhole at Station 27NSR+80, 230'LT. From there it turns and runs northwesterly to a manhole at Station 26NSR+26, 366'LT where it turns and runs northerly to a manhole at Station 183BV+92, 83'RT. From there it runs northwesterly, crossing Swan Boulevard, to beyond the northerly project limits. Adjust, reconstruct and insulate this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 53ESR+11, 14'LT and running westerly to the County Fleet Maintenance Building. This line will remain in place without adjustment.
- An underground sanitary sewer beginning at a manhole at Station 27NSR+80, 44'LT and running northwesterly to an abandoned manhole at Station 27NSR+48, 53'LT. Abandon, remove and bulkhead portions of this line as shown in the plans.

Milwaukee County also has abandoned sanitary sewer facilities within the project limits in the following locations:

- An abandoned sanitary sewer beginning at a manhole at Station 53ESR+11, 14'LT and running northerly to an abandoned manhole at Station 56ESR+08, 10'LT where it turns and runs northeasterly to an abandoned manhole at Station 56ESR+28, 7'RT. From there it turns and runs northerly to an abandoned manhole at Station 27NSR+48, 53'LT where it turns and runs northwesterly and ends at Station 26NSR+67, 81'LT. Bulkhead, leave in place and remove this line as shown in the plans.

Contact Thomas Travia, (414) 257-6418 office / (414) 339-0408 cell, of Milwaukee County 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee, County – Water has underground water main facilities within the project limits in the following locations:

- An underground water main beginning at Station 50ESR+72, 8'RT and running northerly along the west side of the East Service Road to Station 53ESR+22, 6'RT where it turns and runs northwesterly to Station 53ESR+32, 8'LT. From there the line runs northerly to Station 27NSR+37, 6'RT and then continues northerly to Station 27NSR+36, 258'LT where it turns and runs northwesterly to Station 26NSR+39, 344'LT. From there the line runs northerly to Station 184BV+00, 92'RT and ties into a City of Wauwatosa water main. Abandon, remove, cut and cap, leave in place, and reconstruct portions of this line as shown in the plans.
- An underground water main beginning at Station 27NSR+37, 6'RT and running westerly and ending at Station 24NSR+34, 6'RT. Adjust and reconstruct portions of this line as shown in the plans.
- An underground water main beginning at Station 53ESR+32, 3'LT and running westerly to enter the County Fleet Maintenance Building. This line will remain in place without adjustment.
- An underground water main beginning at Station 53ESR+45, 3'LT and running easterly to enter the County Sheriff Substation Building. Abandon, cut and cap, leave in place and remove portions of this line as shown in the plans.
- Two hydronic heating water lines beginning at the easterly wall of the County Fleet Maintenance Building and running easterly, crossing the East Service Road at Station 53ESR+75, and continuing easterly to enter the County Sheriff Substation Building. These lines will be abandoned during construction as part of demolition of the Substation Building.

Milwaukee County also has abandoned water mains within the project limits in the following locations:

- An abandoned water main beginning at Station 50ESR+73, 51'LT and running northerly along the east side of the County Fleet Maintenance Building to Station 184BV+50, 122'RT where it turns and runs northwesterly to beyond the northerly project limits.

- An abandoned water main beginning beyond the westerly project limits and running southeasterly, crossing Swan Boulevard at Station 175BV+35, and continuing southeasterly to Station 22NSR+90, 65'LT where it turns and runs northeasterly and ends at Station 179BV+83, 143'RT.
- An abandoned water main beginning beyond the westerly project limits and running southeasterly, crossing Swan Boulevard at Station 176BV+16, and continuing southeasterly and ending at Station 23NSR+50, 133'LT.
- An underground water main beginning at Station 23NSR+46, 6'RT and running northerly to Station 179BV+83, 122'RT where it turns and runs easterly to Station 180BV+48, 186'RT. From there the line runs northerly to Station 181BV+65, 120'RT where it turns and runs westerly to Station 181BV+46, 91'LT. From there the line runs northerly to beyond the northerly project limits.
- An underground water main beginning at Station 24NSR+34, 6'RT running westerly to Station 21NSR+55, 8'RT where it turns and runs southerly to Station 35WWB+48, 227'LT. From there it runs southeasterly to Station 36WWB+36, 140'LT where it turns and runs southerly to beyond the southerly project limits.
- An underground water service beginning at Station 27NSR+35, 152'LT and running westerly and ending at Station 26NSR+67, 152'LT.

Contact Thomas Travia, (414) 257-6418 office / (414) 339-0408 cell, of Milwaukee County 7 days in advance to coordinate work, locations and any excavation near their facilities.

Time Warner Cable has an underground communications line beginning beyond the southerly project limits and running northerly, crossing Watertown Plank Road at Station 39WWB+30, and continuing northerly to Station 39WWB+30, 98'LT where it turns and runs easterly along the north side of Watertown Plank Road to Station 51ESR+38, 38'LT. From there it turns and runs northerly along the west side of the East Service Road to Station 52ESR+51, 38'LT where it turns and runs westerly to the County Fleet Maintenance Building. This line will remain in place without adjustment.

Time Warner Cable also has abandoned underground communication facilities within the project limits in the following locations:

- An abandoned communications line beginning beyond the southerly project limits and running northerly, crossing Watertown Plank Road at Station 41WWB+79, and continuing northerly to Station 52ESR+55, 32'RT. From there it runs westerly to enter the County Fleet Maintenance Building.
- An abandoned communications line beginning at Station 52ESR+55, 32'RT and running easterly to Station 52ESR+50, 101'RT where it turns and runs northeasterly into the County Sheriff Substation Building.

Contact Steve Cramer, (414) 277-4045 office / (414) 688-2385 cell, of Time Warner Cable 7 days in advance to coordinate locations and any excavation near their facilities.

Wauwatosa, City of – Lighting has overhead and underground street lighting facilities within the project limits in the following locations:

- Light poles and underground electric lines along the north side of Watertown Plank Road throughout the project limits. These facilities will remain in place without adjustment.
- Light poles and underground electric lines along the east and west sides of Swan Boulevard throughout the project limits. These facilities will remain in place without adjustment.

Contact Bill Wehrley, (414) 479-8929 office / (414) 471-8422 cell, of the City of Wauwatosa 7 days in advance to coordinate locations and any excavation near their facilities.

Wauwatosa, City of – Signals has existing traffic signals, control cabinets and underground electric lines at the intersection of Watertown Plank Road and Swan Boulevard. These facilities will remain in place without adjustment.

Contact Bill Wehrley, (414) 479-8929 office / (414) 471-8422 cell, of the City of Wauwatosa 7 days in advance to coordinate locations and any excavation near their facilities.

Wauwatosa Water Utility has an underground water main beginning at Station 33WWB+80, 11'LT and running northerly in the northbound lanes of Swan Boulevard to Station 178BV+37, 52'RT where it turns and runs easterly to Station 178BV+73, 92'RT. From there it runs northeasterly, approximately 30' southeasterly of the curb line of Swan Boulevard, to Station 184BV+93, 71'RT where it turns and runs south to Station 184BV+93, 113'RT. From there it turns and runs easterly, crossing USH 45 and continues to beyond the easterly project limits. This line will remain in place without adjustment.

Contact Jim Wojcehowicz, (414) 479-8965, of the Wauwatosa Water Utility 7 days in advance to coordinate work on City of Wauwatosa water facilities, locations and any excavation near their facilities.

We Energies – Electric has underground and overhead electric facilities within the project limits in the following locations:

- An overhead electric line beginning at a pole at Station 9PR+29, 2'LT and running southeasterly, crossing Swan Boulevard at Station 174BV+65, and continuing southeasterly to a pole at Station 21NSR+37, 31'LT. From there it runs easterly and ends at a pole at Station 23NSR+25, 27'LT. We Energies will remove this overhead line prior to construction.
- An underground concrete-encased duct package beginning beyond the westerly project limits and running easterly, crossing the proposed Park and Ride lot at Station 1PR+66 and crossing Swan Boulevard at Station 167BV+75, and continuing easterly to Station 167BV+74, 109'RT. From there it runs southeasterly to Station 34WWB+95, 70'LT

- where it turns and runs southerly across Watertown Plank Road to beyond the southerly project limits. We Energies will lower this package in place between Station 1PR+66, 34'LT and Station 1PR+81, 174'RT during construction. Contact Jason Chapin (414-944-5575) of We Energies - Electric 5 days prior to the grading of the proposed Park and Ride lot. Allow We Energies 15 working days after grading the proposed Park and Ride lot to perform adjustment of their facilities. The remaining portions of this line will remain in place without adjustment.
- Two underground electric lines beginning beyond the westerly project limits and running easterly to a transformer at Station 1PR+78, 7'LT. From there the lines continue easterly, crossing the proposed Park and Ride lot at Station 1PR+78, and continue to two transformers at Station 167BV+75, 54'LT where they turn and run southerly to Station 167BV+36, 46'LT. From there they run easterly, crossing Swan Boulevard at Station 167BV+36, and continue easterly to a cabinet at Station 167BV+34, 102'RT beyond the project limits. We Energies will relocate these lines and remove the transformers prior to construction.

We Energies - Electric will relocate, construct and reconstruct electric facilities within the project limits in the following locations prior to construction:

- A new underground electric line beginning at Station 9PR+37, 32'LT and running easterly to Station 9PR+38, 72'RT where it will turn and run southeasterly, crossing Swan Boulevard at Station 174BV+90, and continue southeasterly to Station 21NSR+35, 55'LT. From there it will continue southeasterly to Station 21NSR+82, 11'LT where it will turn and run northerly to a new transformer at Station 21NSR+82, 68'LT.
- A new underground electric line beginning beyond the westerly project limits and running easterly, crossing the proposed Park and Ride lot at Station 1PR+40 and crossing Swan Boulevard at Station 167BV+33, and continuing easterly to a cabinet at Station 167BV+34, 102'RT beyond the project limits.

We Energies - Electric also has abandoned electric lines within the project limits in the following locations:

- An abandoned underground electric line beginning at a pole at Station 23NSR+15, 27'LT and running northerly to Station 23NSR+21, 162'LT where it turns and runs northeasterly to Station 179BV+57, 164'RT. From there the line runs northerly to beyond the northerly project limits.
- An abandoned underground electric line beginning at a pole at Station 23NSR+25, 27'LT and running northerly to Station 23NSR+25, 160'LT where it turns and runs easterly to Station 23NSR+75, 150'LT. From there it turns and runs northerly and ends at Station 23NSR+73, 250'LT.
- An abandoned electric line beginning beyond the westerly project limits and running easterly to a pole at Station 1PR+42, 6'LT.

Contact Jason Chapin, (414) 944-5575, of We Energies - Electric 7 days in advance to coordinate locations and any excavation near their facilities.

We Energies – Gas has an underground gas main beginning at Station 50ESR+73, 44’LT and running northerly along the west side of the East Service Road to Station 57ESR+44, 43’LT. This line will remain in place without adjustment.

We Energies - Gas also has abandoned gas facilities within the project limits in the following locations:

- An abandoned gas main beginning at Station 57ESR+44, 43’LT and running northerly to Station 26NSR+96, 327’LT where it turns and runs westerly and ends at Station 25NSR+89, 322’LT.
- An abandoned gas main beginning at Station 26NSR+96, 327’LT and running northwesterly to Station 24NSR+55, 440’LT where it runs northwesterly to Station 23NSR+96, 454’LT. From there it runs northeasterly and ends at Station 24NSR+08, 506’LT.
- An abandoned gas main beginning at Station 24NSR+55, 440’LT and running northeasterly and ending at Station 24NSR+85, 563’LT.

Contact Thomas Minesal, (414) 944-5755, of We Energies - Gas 7 days in advance to coordinate locations and any excavation near their facilities.

We Energies - Steam has abandoned steam facilities within the project limits in the following locations:

- Two underground steam pipes beginning beyond the southerly project limits and running northerly, crossing Watertown Plank Road at Station 42WWB+44, and continuing northerly to Station 52ESR+52, 106’RT where they turn and run westerly, crossing the East Service Road at Station 52ESR+52, and continue westerly to Station 52ESR+52, 46’LT. From there they run northerly along the west side of the East Service Road to Station 53ESR+38, 47’LT where they turn and run westerly to enter the County Fleet Maintenance Building.
- Two underground steam pipes beginning beyond the southerly project limits and running northerly, crossing Watertown Plank Road at Station 41WWB+87, and continuing northerly to Station 53ESR+38, 51’RT where they turn and run westerly, crossing the East Service Road at Station 53ESR+38, and continue westerly to enter the County Fleet Maintenance Building.

Contact Keith Schaefer, (414) 221-2464 office / (414) 861-1782 cell, of We Energies - Steam 7 days in advance to coordinate locations and any excavation near their facilities.

WisDOT – Lighting has light poles and underground electric lines beginning beyond the northerly project limits and running southerly along the west side of the southbound USH 45 exit ramp to Watertown plan Road, and continuing southerly along the ramp to a pull box at Station 51ESR+25, 266’RT. These facilities will remain in place without adjustment.

Contact Eric Perea, (262) 548-8778 office / (414) 750-0935 cell, of WisDOT - Lighting 7 days in advance to coordinate locations and any excavation near their facilities.

WisDOT STOC has underground communications facilities within the project limits in the following locations:

- An underground communications line beginning beyond the westerly project limits and running easterly along the north side of Watertown Plank Road to a vault at Station 167BV+16, 75'LT and continuing easterly, crossing Swan Boulevard at Station 167BV+19, and continuing easterly to a vault at Station 167BV+25, 103'RT. From there it continues easterly along the north side of Watertown Plank Road to a vault at Station 35WWB+69, 54'LT where it turns and runs southerly across Watertown Plank Road to beyond the southerly project limits. This line will remain in place without adjustment.
- An underground communications line beginning at a vault at Station 167BV+16, 75'LT and running northerly along the westerly side of Swan Boulevard, crossing Underwood Creek parkway at Station 226UDE+50, and continuing northerly to a vault at Station 174BV+13, 33'LT. From there it runs northerly and northeasterly along the westerly side of Swan Boulevard to beyond the northerly project limits. This line will remain in place without adjustment.
- An underground communications line beginning at a vault at Station 174BV+13, 33'LT and running southeasterly, crossing Swan Boulevard at Station 174BV+14, and continuing southeasterly and ending at a vault at Station 174BV+18, 89'RT. This line will remain in place without adjustment.
- An underground communications line beginning at a pull box at Station 40WWB+24, 54'LT and running easterly along the north side of Watertown Plank Road to Station 41WWB+89, 51'LT, and continuing easterly along the north side of Watertown Plank Road to beyond the easterly project limits. This line will remain in place without adjustment.
- An underground communications line beginning at Station 41WWB+89, 51'LT and running southerly, crossing Watertown Plank Road at Station 41WWB+90, and continuing southerly to beyond the southerly project limits. This line will remain in place without adjustment.

Contact Jeff Madson, (414) 225-3723, of WisDOT - STOC 7 days in advance to coordinate locations and any excavation near their facilities.

9. Municipality Acceptance of Sanitary Sewer and Water Main Construction.

Both the department and City of Wauwatosa personnel will inspect construction of sanitary sewer and water main under this contract. However, construction staking, testing, and acceptance of the sanitary sewer and water main construction will be by the City of Wauwatosa.

105-001 (20140630)

10. Referenced Construction Specifications.

Construct the sanitary sewer and water main work conforming to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW). If there is a discrepancy or conflict between the referenced specification and the standard specifications regarding contract administration, part 1 of the standard specifications governs.

11. Other Contracts.

A Description

Coordinate your work in accordance to standard spec 105.5.

The following contracts are anticipated to be under construction within the time period of this contract, unless otherwise indicated:

Contract ID 1060-33-80, Zoo IC - Zoo Interchange Phase 1 reconstruction from Lincoln to Bluemound, 121st to 70th. The WisDOT contact is Mark Klipstein at (414) 750-1496.

Contract ID 1060-33-81, Zoo IC – Zoo Interchange Phase 2 reconstruction from Lincoln to Bluemound, 121st to 70th. The WisDOT contact is Mark Klipstein at (414) 750-1496.

12. Hauling Restrictions.

Do not haul materials of any kind on any local roads without approval of the local Maintaining Authority and the department. Provide any proposals to haul on local roads with a written agreement between the contractor and the respective Maintaining Authority. Submit a letter to the department from the Maintaining Authority in agreement to the hauling prior to hauling. Contact the respective Maintaining Authority prior to bidding for approval of haul routes

At all times, conduct operations in a manner that causes minimum disruption to traffic on existing roadways. Coordinate with the local authority.

This provision does not reduce or eliminate the contractor responsibility from restoring local roads under the item maintenance and repair of haul roads.

SEF Rev. 12_1004

13. Environmental Protection and Erosion Control.

Supplement standard spec 107.20 with the following:

Provide the Erosion Control Implementation Plan (ECIP) 14 days prior to the pre-construction conference. Pursue operations in a timely and diligent manner, continuing all construction operations methodically from the initial removals and topsoil stripping operations through the subsequent grading, paving, and re-topsoiling to minimize the period of exposure to possible erosion.

Topsoil graded areas, as designated by the engineer, immediately after grading has been completed within those areas. Seed and mulch, or sod, and fertilize all topsoiled areas within 5 days after placement of topsoil.

Furnish and apply water to sodded areas. After staking and cleanup, moisten the sod thoroughly by sprinkling with water. Keep all sodded areas thoroughly moist by watering or sprinkling if rainfall is not sufficient to achieve sod rooting to the earth bed. Water for 30 days after placement, or as the engineer directs. Apply water in a manner to preclude washing or erosion.

Do not pump water from the construction site to a storm water conveyance without the water first passing through a sediment trap.

Construct temporary sediment traps at locations that do not interfere with construction operations.

Replace standard spec 107.20(3) with the following:

Prepare and submit an Erosion Control Implementation Plan (ECIP) for the project, including borrow sites and material disposal sites, in accordance to Chapter TRANS 401 requirements. The ECIP shall supplement information shown on the plans and shall not reproduce it. The erosion control implementation plan shall identify how the contractor intends to implement the project's erosion control plan. The erosion control plan shall include details for the methods of debris containment devices required, particularly during the removal of the old bridges and construction of the new structures.

14. Public Convenience and Safety.

Revise standard spec 107.8(6) as follows:

Check for and comply with local ordinances governing the hours of operation of construction equipment. Do not operate motorized construction equipment from 9:00 PM until the following 7:00 AM, unless prior written approval is obtained from the engineer.
107-001 (20060512)

Provide 48 hour advanced notice to Mr. William Porter, Director of Public Works, City of Wauwatosa (414) 479-8933 prior to any noise generating construction operations that do not comply with the local ordinances.

15. Notice to Contractor – Airport Operating Restrictions.

Fill out the FAA Notice Criteria tool for any permanent structure (bridge, light pole, etc.) or equipment (crane, etc.) used during construction:

<http://oeaaa.faa.gov/oeaaa/external/portal.jsp>

If required by the Notice Criteria tool, and for any crane or construction equipment higher than 200 feet above the ground, submit completed form 7460-1 (Notice of Proposed Construction or Alteration) to The Federal Aviation Administration (FAA) at least 45 days before starting construction.

SEF Rev. 14_0609

16. Notice to Contractor – Access to Site.

The contractor will not have access to the Sheriff's Building Demolition Area until the removal of asbestos containing materials has been completed. It is anticipated that asbestos containing materials will be removed by the end of June 2015.

The contractor will not have access to the areas containing the Temporary Salt Storage Building and Temporary Shed during removal of those structures by the building owner. This is anticipated to be a one month time period anticipated in August or September.

17. Public Involvement Meetings.

Participate in department-sponsored public involvement meetings as the engineer requests. Ensure that representatives of subcontractors also participate in those meetings if the engineer requests.

SEF Rev. 14_0312

18. Material and Equipment Staging.

Submit a map showing all proposed material stockpile or equipment storage locations to the engineer 14 days prior to either preconstruction or proposed use, whichever comes first. Identify the specific purposes for the location. Obtain written permits from the property owner, and submit two copies to the engineer before use. Do not stockpile or store materials or equipment on wetlands.

SEF Rev. 13_0204

19. 3D Model Data.

The department will provide for Project 1060-34-73 for informational purposes only (see following disclaimer) detailed 3D proposed and existing model data or portions of data which may include: roadways, temporary roadways, topography, grading, temporary grading, drainage, temporary drainage, structures, temporary structures, utilities, abandoned utilities, FTMS, signals, temporary signals, signs, temporary signs, lighting, temporary lighting, pavement markings, landscaping, wetlands, waterways, railways, geotech soil borings, parcels, fencing, and survey monumentation. The department will provide the above data or portions of the 3D model data electronically consisting of electronic 2D/3D files containing features, points, reference lines, breaklines, area extents lines, profiles, LandXML v1.2 files and/or TIN Civil 3D surfaces in Autocad 2012 dwg files with horizontal datum - NAD-83 (GRS-1980) (2007), vertical datum - NAVD-1988 (2007), and coordinate projection - Wisconsin County Coordinate System in U.S. survey

ft. The department will provide the model data prior to project LET date within 5 business days of a contractor request submitted as follows: by email to jeff.bohen@dot.wi.gov.

The department is providing, by agreement with contractor and subcontractors, materials stored electronically. The parties recognize that data, plans, specifications, reports, documents, or other information recorded on or transmitted as electronic media (including but not necessarily limited to “CAD, CIM, BIM, GIS or other electronic documents”) are subject to undetectable alteration, either intentional or unintentional, due to, among other causes, transmission, conversion, media degradation, software error, or human alteration. Accordingly, all such documents are provided to the parties for informational purposes only and not as an end product or as a record document. Any reliance thereon is deemed to be unreasonable and unenforceable. The signed and/or stamped hard copy of the engineer’s Instruments of Service plans, specifications and estimates or other contract documents are the only true contract documents of record.

SEF13_0131

20. Work Force Opportunities.

After contract award, attend the Work Force Opportunities workshop. The workshop will take place on the same day and be in the same location as the pre-construction meeting.

The Work Force Opportunities workshop will provide a venue for contractors to have meaningful dialogue with Transportation Alliance for New Solutions (TrANS) providers regarding the hiring of TrANS graduates. Reference ASP-1 for additional information regarding TrANS. The prime contractor and the three largest subcontractors according to let value of work shall provide staff with hiring authority to participate in a job-matching session during this workshop. Workshop participants will, at a minimum:

- Review contractor hiring processes for general labor positions.
- Listen to a presentation provided by TrANS providers regarding the TrANS training program, including details regarding how contractors can hire TrANS graduates.
- Review TrANS graduate availability for working on the project.
- Meet one-on-one for two minutes with each TrANS graduate in attendance at the meeting.

SEF Rev. 12_0510

21. Available Documents.

The department will make all its information available to bidding contractors. The list of documents that are available for contractors’ information includes but is not limited to:

- Design Study Report
- Pavement Type Selection Report

These documents are available from Jeff Bohen at 141 NW Barstow Street, Waukesha, WI 53187, (262) 750-2928 or jeff.bohen@dot.wi.gov.

Reproduction costs will be applied to any copies requested.
SEF Rev. 13_1218

22. Geotechnical Investigation Information.

Replace standard spec 102.5(3) 2 with the following:

Available information relative to subsurface exploration, borings, soundings, water levels, elevations or profiles are available for review at the department's Regions office. Contact Jeff Bohen, 141 NW Barstow Street, Waukesha, WI 53187, (414) 750-2928.

- Department of Public Works Site Improvement, ID 1060-34-73 (Dated July 1, 2014)

Additional geotechnical information is available from studies and analyses that have been performed by F45 for the Wisconsin Department of Transportation (WisDOT) for other aspects of this project. Review the available information to determine if it is of use. The use or not of the geotechnical information does not relieve performing the work in accordance to the plans and specifications.

SEF Rev. 12_0813

23. Contractor Notification.

Replace standard spec 104.2.2.2(2) with the following:

If the contractor discovers the differing condition, provide a written notice, as specified in standard spec 104.3.3, of the specific differing condition before further disturbing the site and before further performing the affected work.

104.3.2 (Vacant)

104.3.3 Contractor Initial Written Notice

Replace standard spec 104.3.2 and standard spec 104.3.3 with the following:

If required by standard spec 104.2, or if the contractor believes that the department's action, the department's lack of action, or some other situation results in or necessitates a contract revision, promptly provide a written notice to the engineer. At a minimum, provide the following:

- A written description of the nature of the issue.
- The time and date of discovering the problem or issue.
- If appropriate, the location of the issue.

Provide the additional information specified in standard spec 104.3.5 as early as possible to assist the engineer in the timely resolution of an identified issue. The engineer will not require, in subsequent submissions, duplication of information already provided.

SEF Rev. 12_0823

24. Contractor Document Submittals.

This special provision describes minimum requirements for submitting project documents to the department. This special provision does not apply to shop drawing submittals.

Provide one electronic copy of all documents requiring department review, acceptance, or approval. Attach a completed engineer-provided transmittal sheet to each email submittal. The department will reject submittals with incomplete transmittal sheets and require re-submittal.

The department will return one reviewed, accepted, or approved original to the contractor. Additional return originals can be requested. Submit an additional original for each additional return original requested.

Submit electronic copies in Adobe Acrobat (.pdf) format via email to an account the engineer determines. If possible, translate original documents from their native format (e.g. Word, Excel, AutoCAD, etc.) using an Adobe Acrobat translation routine. Scan other documents to Adobe Acrobat format with a minimum resolution of 600 dpi.

All costs for contractor document submittals are incidental to the contract.

SEF Rev. 14_0602

25. Information to Bidders, Use of Recovered Material.

The department encourages the use of waste materials and recovered industrial byproducts as material substitutions (106.2.1), provided they meet standard specification gradation requirements, conform to NR 538 requirements, and/or follow standard engineering practice for their intended use.

SEF Rev. 12_1212

26. Labor Compliance Reporting – Payroll Requirements.

Submit weekly certified payrolls verifying prevailing wage rates for all work performed under the contract as directed in the civil rights and labor compliance management system manual. Submit weekly certified payrolls within 7 calendar days of the week covered by the weekly certified payroll.

SEF Rev. 12_1008

27. Dust Control Implementation Plan.

A Description

Develop, update, and implement a detailed Dust Control Implementation Plan (DCIP) for all land-disturbing construction activities and associated impacts both within the project site boundaries and outside the project site boundaries. Incorporate contract bid items that this article specifies into the DCIP.

B (Vacant)

C Construction

C.1 General

Take responsibility for dust control on the project as specified in standard spec 107.18. Minimize dust emissions resulting from land disturbing activities. Do not generate excessive air borne particulate matter (PM) or nuisance dust conditions. Take direct responsibility for controlling dust at all times throughout the duration of the contract, 24 hours per day, 7 days per week, including non-working hours, weekends, and holidays.

Submit a DCIP to the engineer for review at least 14 calendar days before the preconstruction conference. Coordinate with the department, if requested, to resolve DCIP related issues before the preconstruction conference. The department will either approve the DCIP or request revisions. Do not initiate any land-disturbing activities without the department's approval of the DCIP.

C.2 Dust Control Implementation Plan Contents

Develop a DCIP tailored to the specific needs of the project. Consider potential impacts to businesses and residences adjacent to the job site. Describe in detail all land disturbing, dust generating activities. Identify strategies to prevent, mitigate, and collect excess dust. Establish clear lines of communication with the engineer to ensure that all dust control issues can be dealt with promptly.

The DCIP shall include, but not be limited to, all of the following:

1. A single contact person with overall responsibility for the DCIP development as well as surveillance and remediation of job related dust. Include the following:
 - Name, firm, address, and working-hours phone number.
 - Non-working-hours phone number.
 - Email address.
2. Individual contact persons and their respective areas of responsibility. Include the following:
 - Name, firm, address, and working-hours phone number.
 - Non-working-hours phone number.
 - Email address.

3. A site map locating project features, the job site boundaries, all ingress and egress points, air intakes and other dust-sensitive areas, and all public and private paved surfaces within and immediately adjacent to the job site. Show where specific land disturbing, dust generating activities will occur and, to the extent possible, where employing various dust control or prevention strategies.
4. A matrix showing, for each anticipated land disturbing, dust generating activity, the following:
 - Preventive measures that shall be employed.
 - The applicable contact person.
 - The contractor's timetable and/or surveillance measures used to determine when remediation is required.
 - The specific dust control and remediation measures that shall be employed. List the specific contract bid items that shall be used for payment. Also indicate costs that are incidental to the contract.
 - Both maintenance and cleanup schedules and procedures.
 - How excess and waste materials shall be disposed of.
5. A description of how off-site impacts shall be monitored and dealt with.

C.3 Updating the Dust Control Implementation Plan

Update the DCIP throughout the term of the contract as the engineer directs. Obtain the engineer's approval for all DCIP alterations. Also obtain the engineer's approval for DCIP routine adjustments for weather, job conditions, or emergencies that will have an impact on payment under the bid items listed in the approved DCIP.

C.4 Dust Control Deficiencies

Correct engineer identified dust control deficiencies within the time the engineer specifies. The engineer will allow from 30 minutes to 24 hours from the time the engineer notifies the contractor in writing of the deficiency. Deficiencies include, but are not limited to, actions or lack of actions resulting in excessive dust, failing to comply with the contractor's dust control implementation plan or associated special provisions, and failing to properly maintain equipment.

D Measurement

The department will measure the various bid items associated with dust control as specified in the applicable measurement subsections of either the standard specifications or other contract special provisions. The department will not measure work performed under a DCIP alteration unless the engineer specifically approves that alteration.

Measurement under the DCIP shall include, but is not limited to, the contract bid items listed below:

623.0200	Dust Control Surface Treatment
624.0100	Water
628.7560	Tracking Pads
SPV.0105.0002	Pavement Cleanup Project 1060-34-73

The department will measure work completed under other existing contract bid items if approved as a part of the DCIP. The department will consider new bid items to the contract if proposed under the DCIP. The department will not measure work required under the DCIP that is not included in contract bid items.

E Payment

All costs associated with the development and updating of the DCIP are incidental to the contract. The department will pay separately for the work required to implement the actions approved in the DCIP under the contract bid items approved as a part of the DCIP. All other costs associated with work approved under the DCIP are incidental to the contract.

SEF Rev. 12_1004

28. Project Site Air Quality.

Because fine particulate matter levels for Milwaukee, Racine and Kenosha Counties are typically close to PM_{2.5} limits and the project is in a non-attainment area for the federal 8-hour ozone standard, contributions from construction activities can have a major impact well beyond the project limits. Take practical measures to mitigate the impact of operating construction equipment on the air quality in and around the project site.

Voluntarily establishing the staging zones for trucks waiting to load and unload is encouraged by the department. Locate staging zones where idling of diesel powered equipment will have minimal impact on abutting properties and the general public. The department will make signs available to help identify these zones. Have truckers queue up in these zones whenever it is practical. The department further encourages drivers to shut down diesel trucks as soon as it appears likely that they will be queued up for more than ten minutes. Notify employees and sub-contractors about fueling and engine idling.



Portable Concrete Crusher Plants

Portable concrete crusher plants may need a NR 440 Concrete Crusher Plant Air Permit for air emissions. Please contact Mike Griffin, Wisconsin Department of Natural Resources, Air Compliance Engineer (414) 263-8554 to request additional information and permit application materials. Complete permit applications may take 3 months to process.

SEF Rev. 12_1008

29. Owner Controlled Insurance Program.

Section 107.26, "Standard Insurance Requirements" is deleted in its entirety and the following standard spec 107.26 is substituted thereof:

107.26 Standard Insurance Requirements

107.26(1)(a) Owner Controlled Insurance Program

1. Overview. The State of Wisconsin, Department of Transportation ("the WisDOT") has arranged with Aon Risk Solutions, (the "OCIP administrator") for this Project to be insured under its Owner Controlled Insurance Program ("OCIP"). The OCIP is more fully described in the Zoo Interchange manual for the Owner Controlled Insurance Program (the "Insurance Manual") and the Safety and Health Plan Manual that are incorporated in this Special Provision and the Contract by this reference. Parties performing labor or services at the Project Site (as defined by the OCIP Policies) are eligible to enroll in the OCIP unless the party is an excluded party (as defined below). The OCIP will provide to enrolled parties (as defined below) workers' compensation and employer's liability insurance, commercial general liability insurance, Builders Risk and Excess Liability insurance as summarily described below in connection with the performance of the Work ("OCIP coverage's").

2. Enrolled Parties and Their Insurance Obligations. OCIP coverage applies only to Enrolled Parties. Enrolled Parties include the WisDOT and its employees, non-excluded Contractors and Subcontractors of all tiers who enroll in the OCIP, all employees of Enrolled Contractor's and Subcontractor's who perform Work at the Project Site, and such other persons or entities that the WisDOT, in its sole discretion, may designate (each such party who is insured under the OCIP is collectively referred to as an "Enrolled Party").

Enrolled Parties shall obtain and maintain, and shall require each of its Subcontractors to obtain and maintain, the insurance coverage specified in 107.26(1)(a) 8 below.

3. Excluded Parties and Their Insurance Obligations. OCIP coverage's do not apply to the following "Excluded Parties":

- a. Hazardous materials remediation, removal and/or transport companies;
- b. Vendors *, suppliers, fabricators, material dealers, truckers**, haulers, drivers and others who merely transport, pickup, deliver, or carry materials, personnel, parts or equipment or any other items or persons to or from the Project;

* WisDOT is requiring all vendors who perform maintenance on an enrolled contractor's equipment to be enrolled in the OCIP. Please see "WisDOT OCIP Enrollment Guidance Relating to Service Vendors" to determine whether they will be enrolled per project id number or on a Miscellaneous blanket basis.

** Truckers that come on site must remain in the cab of the vehicle.

Refer to the "Enrollment Matrix" which clearly outlines the requirements contingent upon the category that the entity falls under, such as: Contractor; Subcontractor; Consultant; Visitor; etc.

- c. Sanitary disposal facility providers, if the only function is to drop off the units and pick them up later, they are material suppliers and are excluded. If the company also services/cleans the units on site, that is no longer being a material supplier. (Refer to "Enrollment Matrix", Vendors Providing Maintenance On Site).
- d. Contractors and Subcontractors of any tier that do not perform any actual labor on the Project site;
- e. Any party or entity not specifically identified in this special provision or excluded by the WisDOT as permitted by law, even if otherwise eligible.
- f. If you are not employed by an Enrolled Party, but performing services of an Excluded Party, you are not covered by the OCIP.

Excluded Parties and parties not enrolled in the OCIP shall obtain and maintain, and shall require each of its excluded Subcontractors to obtain and maintain, the insurance coverage specified in Section 107.26(1)(a) 8 below and in the Insurance Manual. Excluded Parties shall comply with all of the safety requirements pursuant to 107.26(1)(a) 16.

- 4. OCIP Insurance Policies Establish OCIP coverage's.** The OCIP coverage's and exclusions summarized in this special provision and the other contract documents are set forth in full in their respective insurance policy forms. The summary descriptions of the OCIP coverage's in this special provision or the Insurance Manual are not intended to be complete or to alter or amend any provision of the actual OCIP coverage's. In the event any provision of this special provision, the Insurance Manual, or the contract documents, conflicts with the OCIP insurance policies, the provisions of the actual OCIP insurance policies shall govern.

- 5. Summary of OCIP Coverage's.** OCIP coverage's will apply only to those operations of each Enrolled Party performed at the Project Site (as defined in the OCIP insurance Policies) in connection with the Work and only to Enrolled Parties that are eligible for the OCIP.

The OCIP coverage's are primary insurance for all Enrolled Parties for occurrences during the policy period at the Project Site (as defined in the OCIP Policies). The OCIP will provide at least the following insurance to Enrolled Parties:

Summary of OCIP Coverages

This is a brief description of OCIP Insurance Coverage. Enrolled Parties should refer to the actual policies for details concerning coverage, exclusions and limitations.

- a. Workers' Compensation Insurance -Statutory Limit including Jones Act and USL&H coverage, as applicable.
- b. Employer's Liability Insurance \$1,000,000 Bodily Injury by Accident, each accident \$1,000,000 Bodily Injury by Disease, each employee \$1,000,000 Bodily Injury by Disease, policy limits
- c. Commercial General Liability (ISO Occurrence Form – Limits Shared By All Insureds) \$2,000,000 Each Occurrence Limit (Annual Limit) \$2,000,000 Personal/Advertising Injury Aggregate \$4,000,000 General Aggregate Limit for all Enrolled Parties (Annual Limit)

\$4,000,000 Products & Completed Operations Aggregate for all Enrolled Parties (Single Limit Applies to Entire Products & Completed Operations Extension)

10 yr. Products & Completed Operations Extension

- d. The OCIP Commercial General Liability policy will not provide coverage for any claim that could be covered under a property policy or Builder's Risk policy.
- e. Excess Liability insurance (over Employer's Liability & General Liability – Limits Shared by All Insureds)

\$100,000,000 Each Occurrence Limit

\$100,000,000 Aggregate (Annual Limit)

\$100,000,000 Products & Completed Operations Aggregate Limit (Single Limit Applies to Entire Products & Completed Operations Extension).

- f. Builder's Risk Insurance Coverage:

This is a brief description of Builder's Risk Insurance Coverage. Contractor should refer to the actual policies for details concerning coverage, exclusions and limitations.

The Builder's Risk insurance covers insures property, including materials, supplies, machinery, fixtures and equipment which will become a permanent part of the Work (excluding road work at grade level) in the course of construction.

The Builder's Risk coverage insures WisDOT and Enrolled Parties.

Builders Risk:

Limit

Each Occurrence Limit
\$100,000,000

Builder's Risk Obligation:

13. Contractor or Subcontractor shall pay to the WisDOT's designee within five (5) days
14. written notice a maximum of up to twenty-five thousand dollars (\$25,000.00) for each loss payable under the Builder's Risk Policy attributable to Contractor's Work, acts or omissions, or the Work, acts or omissions of any of Contractor's Subcontractors, or any other entity or party for whom Contractor may be responsible ("builder's risk obligation").

6. The WisDOT's Insurance Obligations.

- a. The WisDOT will pay the costs of premiums for the OCIP coverage's and WisDOT will receive or pay, as the case may be, all adjustments to such costs, whether by way of dividends, retroactive adjustments, return premiums, other moneys due, audits or otherwise.
- b. The WisDOT assumes no obligation to provide insurance other than that specified in this special provision and the OCIP insurance policies.
- c. Except as provided by applicable law, the WisDOT's furnishing of OCIP coverage's will in no way relieve or limit, or be construed to relieve or limit, Contractor or any of its Subcontractors of any responsibility, liability, or obligation imposed by the contract documents, the OCIP insurance policies, or by law, including without limitation any indemnification obligations which Contractor or any of its Subcontractors has to the WisDOT there under. The WisDOT reserves the right at its option, to furnish other insurance coverage of various types and limits provided that such coverage is not less than that specified in the contract documents.

7. Contractor's OCIP Obligations. Contractor shall:

- a. Assign to WisDOT the right to receive all such adjustments, and shall require that each of its Subcontractors of every tier assigns to WisDOT the right to receive all such adjustments.
- b. Incorporate the terms of this special provision in all subcontract agreements.
- c. Enroll and maintain enrollment in the OCIP, and shall ensure that each non-Excluded subcontractor, enrolls and maintains enrollment in the OCIP. Enrollment shall take place within five (5) days of a receipt of a Notice to Proceed, and prior to commencement of work. Comply with all of the administrative, safety, insurance, and other requirements outlined in this special provision, the Insurance Manual, the OCIP insurance policies, the Safety and Health Plan Manual, or elsewhere in the contract documents.
- d. Provide each of its Subcontractors with a copy of the Insurance Manual and ensure Subcontractor compliance with the provisions of the OCIP insurance policies, the Insurance Manual, this special provision, and the contract documents. The failure of (a) the WisDOT to include the Insurance Manual in the bid documents or (b) Contractor to provide each of its eligible Subcontractors with a copy of same shall not relieve Contractor or any of its Subcontractors from any of the obligations contained therein.
- e. Acknowledge, and require all of its Subcontractors to acknowledge in writing, that the WisDOT and the OCIP administrator are not agents, partners or guarantors of the insurance companies providing coverage under the OCIP (each such insurer, an "OCIP insurer") and that the WisDOT is not responsible for any claims or disputes between or among Contractor, its Subcontractors, and any OCIP insurer(s). Any type of insurance coverage or limits of liability in addition to the OCIP coverage's that Contractor or any Subcontractor requires for its or their own protection, or that is required by applicable laws or regulations, shall be Contractor's or its Subcontractor's sole responsibility and expense and shall not be billed to the WisDOT.
- f. Cooperate fully with the OCIP administrator and the OCIP insurers, as applicable, in its or their administration of the OCIP.
- g. Provide, within five (5) business days of the WisDOT's or the OCIP administrator's request, all documents or information as requested of Contractor or its Subcontractors. Such information may include but not be limited to, payroll records, certified copies of insurance coverage's, declaration pages of coverage's, certificates of insurance, underwriting data, prior loss history information, insurance audits, safety records or history, OSHA citations, or such other data or information as the WisDOT, the OCIP administrator, or OCIP insurers may request in the administration of the OCIP, or as required by the Insurance Manual.

- h. Pay to the WisDOT's designee within five (5) days of written notification, a sum of up to **\$10,000** of each claim, including court costs, attorneys fees and costs of defense for property damage to the extent losses are insured under the OCIP Commercial General Liability policy for those losses that are attributable to Contractor's Work, acts or omissions, or the Work, acts or omissions of any of its Subcontractors, or any other entity or party for whom Contractor may be responsible ("contractor General Liability obligation"). The contractor General Liability obligation will not be insured by the OCIP Coverage's.

8. Additional Insurance Required From Enrolled Parties and Excluded Parties.

Contractor shall obtain and maintain, and shall require each of its Subcontractors of every tier to obtain and maintain, the insurance coverage specified in this Section in a form and from insurance companies reasonably acceptable to the WisDOT. The insurance limits may be provided through a combination of primary and excess policies, including the umbrella form of policy. The insurance required by this Section shall conform to the WisDOT's requirements outlined in the Insurance Manual and be written by companies authorized to do business in the state of Wisconsin with an **A.M. Best rating of A-or better**. Contractor shall provide certificates of insurance coverage to the WisDOT as required below and by the Insurance Manual.

As to Enrolled Parties, the Workers' Compensation, Employer's Liability, and Commercial General Liability insurance required by this section shall only be for operations away from the Project Site (as defined by OCIP Policies). The cost of providing the required insurance coverage and limits is incidental to the contract. The department will make no additional or special payment for providing insurance.

TYPE OF INSURANCE MINIMUM LIMITS REQUIRED

1. Commercial General Liability insurance shall be endorsed to include Blanket Contractual Liability coverage.
 - a. \$2,000,000 Combined Single Limits per occurrence with an annual aggregate limit of not less than \$4,000,000.
 - b. The OCIP Coverage's shall exclude blasting or explosion operations. If blasting or explosion operations are used in connection with the Work, Commercial General Liability insurance shall not contain an exclusion for blasting or explosion and shall be provided in limits established by the WisDOT at the time such blasting or explosion methods are elected. Such coverage shall apply to operations whether the operations occur on the Project site or away from the Project site.
 - c. Wisconsin Department of Transportation, their respective officers, agents and employees, and any additional entities as the WisDOT may request as additional insureds must be named as an Additional Insured which shall include: i) liability arising out of the Work performed by the named insured; ii) liability arising out of the supervision of the Work performed by or operations of the named insured; and iii) liability of the acts or omissions of the Additional Insureds relating to Work performed by the named insured for the Project, except for sole negligence of the

Additional Insureds iv) will state that coverage is afforded on a primary and non-contributory basis.

- d. Ongoing Construction Operation(s) in effect at all times while work is being performed by Contractor;
- e. Subcontractors and Independent Contractors (if any);
- f. Products and Completed Operations, including coverage applicable to additional insureds (as required by this agreement) with Completed Operations coverage to remain in force, whether by endorsement or renewal of coverage, including the Contractor, any party required to be indemnified by this Contract and any other party required by this Contract to be named as an additional insured, for at least two (2) years from the date of final completion of the Project and WisDOT's acceptance of the work; and
- g. Explosion, collapse, and underground hazards.
- h. Contractual Liability (insured contract) coverage sufficient to meet the requirements of this Contract (including defense costs and attorney's fees assumed under contract);
- i. Personal and Advertising Injury Liability coverage (with the standard contractual and employee exclusions deleted);
- j. Notice and Knowledge of Occurrence conditions limited to the knowledge of relevant corporate officers or risk managers with an Unintentional Errors and Omissions provision (providing that the insurer may not deny coverage unless it can show that it has been prejudiced by a failure of the insured to comply with a condition of the policy); and
- k. CG 22 79 07 98 (or equivalent) is the only acceptable Professional Liability Exclusion.
- l. Operations performed within 50' of railroad
- m. Contractors must provide their own insurance for owned, leased, rented and borrowed equipment, whether such equipment is located at a Project Site or "in transit". Contractors are solely responsible for any loss or damage to their personal property including, without limitation, property or materials created or provided under the Contract until installed at the Project Site, Contractor tools and equipment, scaffolding and temporary structures.

2. Workers' Compensation and Employer's Liability insurance.

a. Workers' Compensation Limits: Statutory Limits

b. Employer's Liability limits:

\$1,000,000 Bodily Injury by Accident, each accident \$1,000,000 Bodily Injury by Disease, each employee \$1,000,000 Bodily Injury by Disease, policy limits

Terms and conditions shall include:

- USL&H – where applicable.
- Jones Act – where applicable.
- All states endorsement -where applicable.

3. Commercial Automobile Liability insurance as specified by Insurance Services Office (ISO), form CA 00 01, symbol 1 (any auto) with the following limits and endorsements:
 - a. No Trucking or Hauling: \$1,000,000 Each Accident
 - b. Trucking or Hauling (Non Hazardous Materials): \$2,000,000 Each Accident
 - c. Trucking or Hauling Hazardous Materials: \$5,000,000 Each Accident with an MCS 90 Endorsement and ISO Endorsement CA 99 48.
4. For any work over water, whether deemed navigable or otherwise, Contractors Pollution Liability insurance with \$2,000,000 per occurrence and \$2,000,000 aggregate policy limits.
5. Aviation and/or Watercraft Liability insurance, as appropriate, including hull and protection and indemnity for watercraft, or other insurance, in form and with limits of liability and from an insuring entity reasonably satisfactory to the WisDOT.

Contractor's failure to procure or maintain the insurance required by this Section and to assure all its Subcontractors of every tier maintain the required insurance during the entire term of the contract shall constitute a material breach of this contract under which the WisDOT may immediately suspend or terminate this contract or, at its discretion, procure or renew such insurance to protect the WisDOT's interests and pay any and all premiums in connection therewith, and withhold or recover all monies so paid from the Contractor.

Contractor shall provide the WisDOT with certificates of insurance as evidence that required coverage's for insurance detailed in this section are in force. The bidder shall provide certificates of insurance in their pre-qualification statement as specified in 102.1.

Contractor shall notify the WisDOT at least 60 calendar days before a cancellation or material change in coverage and only obtain coverage from insurance companies licensed to do business in the state that have an A.M. Best rating of A- or better. The cost of providing the required insurance coverage and limits is incidental to the contract. The WisDOT will make no additional or special payment for providing insurance.

The above insurance requirements shall apply with equal force whether the Contractor or a Subcontractor, or anyone directly or indirectly employed by either, performs the work under the Project.

9. Additional Insureds:

All insurance required by this agreement (excluding only workers compensation insurance) shall name WisDOT, all parties required to be indemnified by this Contract and all other parties as reasonably requested by the WisDOT, as additional insureds. All policies (including primary, excess and/or umbrella) must provide that coverage shall be primary and non-contributory to any insurance maintained by the Contractor or the additional

insured, all of which shall be stated on the Certificate of Insurance provided by the Contractor. The Additional Insured Endorsement shall be on Form CG 20 10 11/85, or CG 20 33 10/01 plus CG 20 37 10/01, or equivalent, and shall include ongoing and completed operations coverage, which shall not contain any restrictions.

IN THE EVENT THAT THE LAW OF THE STATE IN WHICH THE PROJECT IS LOCATED (OR APPLICABLE LAW) LIMITS THE ADDITIONAL INSURED COVERAGE THAT WISDOT MAY REQUIRE FROM THE CONTRACTOR, THEN THE CONTRACTOR SHALL BE REQUIRED TO OBTAIN ADDITIONAL INSURED COVERAGE TO THE FULLEST EXTENT OF COVERAGE AND LIMITS ALLOWED BY APPLICABLE LAW AND THIS CONTRACT SHALL BE READ TO CONFORM TO SUCH LAW.

10. Contractor Representations and Warranties to the WisDOT. Contractor represents and warrants to the WisDOT or behalf of itself and its Subcontractors:

- a. That all information it submits to the WisDOT or the OCIP administrator shall be accurate and complete.
- b. That Contractor, on behalf of itself and its Subcontractors, has had the opportunity to read and analyze copies of the OCIP binders and specimen policies that are on file in the WisDOT's office. Any reference or summary in the contract, this special provision, the Insurance Manual, or elsewhere in any other contract document as to amount, nature, type or extent of OCIP coverage's and/or potential applicability to any potential claim or loss is for reference only. Contractor and its Subcontractors have not relied upon said reference but solely upon their own independent review and analysis of the OCIP coverage's in formulating any understanding and/or belief as to amount, nature, type or extent of any OCIP coverage's and/or its potential applicability to any potential claim or loss.
- c. That the costs of OCIP coverage's were not included in Contractor's bid or proposal for the Work, the contract price, and will not be included in any change order, change modification, or any request for payment for the Work or extra work. The "costs of OCIP coverage's" is defined as the dollar amount of premiums, costs and fees the Contractor and its Subcontractors would have paid its insurance carrier to insure the operations and exposures which are being insured under the OCIP.
- d. That Contractor acknowledges that the WisDOT will not pay or compensate Contractor or any Subcontractor, in any manner, for costs of OCIP coverage's or for "insurance costs" except as specifically required to be maintained by Contractor by the terms of this special provision.

11. Severability of Interests (Cross Liability):

All insurance required by this agreement (excluding only workers compensation insurance) shall include a provision or be endorsed to provide that, inasmuch as the policy is written to cover more than one insured, all terms, conditions, insuring agreements and endorsements, with the exception of limits of liability, shall operate in the same manner as if there were a separate policy covering each insured. No cross liability exclusions are permitted and there may not be any restrictions in any policies that limit coverage for a claim brought by an additional insured against a named insured. Also, there shall not be any provision in any insurance policy which excludes or conditions coverage on the existence of a contract or other agreement requiring insurance.

12. Breach of Insurance Requirements:

The Contractor's failure to obtain and maintain insurance coverages as required by this agreement shall constitute a material breach of the Contract. In such event WisDOT may at its option: (i) terminate the Contractor for default; or (ii) purchase such coverage and backcharge the premium and associated costs to the Contractor; or (iii) at their respective option, WisDOT and/or an additional insured can require the Contractor and/or its Subcontractors to pay for attorney's fees, expenses, damages and liability as a result of any claim or lawsuit to the extent coverage would have been provided to them under the Contractor's insurance but for the Contractor's breach WisDOT has the right to backcharge the Contractor for such sums. Furthermore, to the extent of their respective interest, the Insurers of those entities that were to be included as additional insureds are deemed to be third-party beneficiaries of the insurance procurement obligation.

13. Subcontractor:

Before permitting any Subcontractor to perform work under a subcontract, the Contractor shall require by written contract that the Subcontractor maintain insurance in like form and amounts to that required herein. The Contractor shall be responsible to ensure that each Subcontractor maintains insurance in like form and amounts and shall Provide evidence of same if requested. Contractor shall provide copies of its Subcontractor's certificates of insurance coverage to WisDOT or the OCIP Administrator upon request.

14. Notice of Cancellation:

All insurance coverages required by this agreement shall contain a provision that the coverage afforded thereunder cannot be cancelled, non-renewed, allowed to lapse, or have any restricted modifications added unless at least thirty (30) days prior written notice has been given to WisDOT. The Contractor is responsible to provide replacement coverage conforming with the requirements of this agreement in the event of any cancellation, non-renewal or modification of any insurance coverages required by this agreement.

15. Limits of Insurance:

The Contractor's insurance coverage and any additional insured coverage provided to WisDOT and any additional insured shall be for the full amount of any loss up to the policy(s) limits of liability and shall not be limited to the minimum insurance requirements of this Contract. The Contractor is responsible for notifying its insurance carriers in the event of a loss or potential loss involving coverage for the additional insureds. However, this does not prohibit any additional insureds from reporting a claim directly to the Contractor's insurance carriers.

16. Deductibles/Denial of Claims:

The Contractor shall be responsible, at no additional cost to WisDOT, for the payment of any deductibles or self-insured retention in connection with the insurance coverages required by this agreement, both for itself and all additional insureds. Any self-insured retention or deductible must be declared in writing at the time the Contractor submits its bid and must be specifically approved by WisDOT prior to execution of the Contract. The Contractor shall be responsible for any loss arising out of coverage denial by its insurance carrier. The Contractor may not procure policies that limit who may pay the SIR or deductible; rather, any SIR shall be payable by either the Contractor or the Subcontractor and the Contractor may not have a policy that prevents WisDOT from accessing or triggering coverage unless the SIR is paid by the Contractor. Contractor shall also ensure that similar conditions are incorporated into all subcontracts. In the event that WisDOT is required to pay any deductible and/or SIR to access any insurance policy, Subcontractor shall promptly reimburse the Contractor for such payment.

17. No Waiver of Insurance Requirements:

IT IS EXPRESSLY AGREED BETWEEN WISDOT AND THE CONTRACTOR THAT THE FAILURE OF WISDOT TO REQUIRE OR VERIFY COMPLETE AND TIMELY PERFORMANCE OF THE CONTRACTOR'S OBLIGATIONS UNDER THIS CONTRACT SHALL NOT BE A WAIVER BY WISDOT OF ANY RIGHT OF WISDOT TO REQUIRE THE CONTRACTOR TO COMPLY WITH THESE INSURANCE REQUIREMENTS AND/OR TO SEEK DAMAGES BECAUSE OF THE CONTRACTOR'S FAILURE TO COMPLY WITH THE INSURANCE REQUIREMENTS IN THIS CONTRACT.

18. Audits. Contractor agrees that the WisDOT, the OCIP administrator, and/or any OCIP insurer may audit Contractor's or any of its Subcontractor's Project payroll records, books and records, insurance coverage's, insurance cost information, or any other information that Contractor provides to the WisDOT, the OCIP administrator, or the OCIP insurers to confirm their accuracy and to assure that costs of OCIP coverage's are not included in any payment for the work.

19. The WisDOT's Election to Modify or Discontinue OCIP. The WisDOT may, for any reason, modify the OCIP coverage's, discontinue the OCIP, or request that Contractor or any of its Subcontractors withdraw from the OCIP upon thirty (30) days written notice. Upon such notice Contractor and/or one or more of its Subcontractors, as specified by the

WisDOT in such notice, shall obtain and thereafter maintain at the WisDOT's expense, Contractor Maintained Coverages (or a portion thereof as specified by the WisDOT) of the OCIP coverage's. The form, content, limits of liability, cost, and the insurer issuing such replacement insurance shall be subject to the WisDOT's approval.

20. Withhold of Payments. The WisDOT may withhold from any payment owing to Contractor the costs of OCIP coverage's if included in a request for payment. In the event the WisDOT audit of Contractor's records and information as permitted in the Contract, this special provision, or other contract documents reveals a discrepancy in the insurance, payroll, safety, or any other information required by the contract documents to be provided by Contractor to the WisDOT, or to the OCIP administrator, or reveals the inclusion of costs of OCIP coverage's in any payment for the work, the WisDOT will have the right to full deduction from the Contract Price of all such costs of OCIP coverage's and all audit costs. Audit costs will include but not be limited to the fees of the OCIP administrator, and the fees of attorneys and accountants conducting the audit and review. If the Contractor or its Subcontractors fail to timely comply with the provisions of this special provision or the requirements of the Insurance Manual, the WisDOT may withhold any payments due Contractor and its Subcontractors until such time as they have performed the requirements of this special provision. Such withholding by the WisDOT will not be deemed to be a default hereunder.

21. Waiver of Claim and Waiver of Subrogation:

Where permitted by law, Contractor hereby waives all rights of recovery under subrogation because of deductible clauses, inadequacy of limits of any insurance policy, limitations or exclusions of coverage, or any other reason against the WisDOT, the State of Wisconsin and any of its Agencies or Officer's, Agents or employees including without limitation, the OCIP administrator, its or their officers, agents, shareholders or employees of each, if any, and any other Contractor or Subcontractor performing work or rendering services on behalf of the WisDOT in connection with the planning, development and construction of the Project, and Contractor shall require that all Contractor maintained insurance coverage related to the work include clauses providing that each insurer shall waive all of its rights of recovery by subrogation for claims described above.

22. Waiver of Subrogation. Where permitted by law, Contractor shall also require that all Contractor maintained insurance coverage related to the work include clauses providing that each insurer shall waive all of its rights of recovery by subrogation against the WisDOT, the State of Wisconsin and any of its Agencies or Officer's, Agents or employees including without limitation, the OCIP administrator, its or their officers, agents, shareholders or employees of each, if any. Contractor shall require similar written express waivers and insurance clauses from each of its Subcontractors. A waiver of subrogation shall be effective as to any individual or entity even if such individual or entity (a) would otherwise have a duty of indemnification, contractual or otherwise, (b) did not pay the insurance premium directly or indirectly, and (c) whether or not such individual or entity has an insurable interest in the property damaged.

23. Conflicts. In the event of a conflict, the provisions of this special provision shall govern, then the provisions of the contract and its other related contract documents, then the provisions of the Insurance Manual.

24. Safety. Contractor shall be solely responsible for safety on the Project and safety relating to the Work. Contractor shall establish a safety program that, at a minimum, complies with all local, state and federal safety standards, and any safety standards established by the WisDOT for the Project, including the Project Safety and Health Plan Manual.

SEF-ZOO IC 13_0114

30. Subletting the Contract.

Replace paragraph 108.1.1 (3) with the following:

If proposing to have a party other than a subcontractor perform work, notify the engineer and submit details of this arrangement in writing. The engineer will determine if that arrangement constitutes subcontracting. Submit copies of all other agreements between any parties regarding the performance of work under the contract with the Request to Sublet.

SEF Rev. 13_0225

31. CPM Progress Schedule.

Submit a CPM Progress Schedule and updates in accordance to standard spec 108.4.4, and as hereinafter provided.

To ensure compatibility with the Master Program Schedule, use the latest version of Primavera Project Planner (P6), by Primavera Systems, Inc., Bala Cynwyd, PA to prepare the Initial CPM Progress Schedule, Monthly CPM Progress Updates and other CPM Progress Revisions requested by the engineer.

Within five business days after award, the department will provide its current standard Work Breakdown Structure and activity codes to use to develop the Initial CPM Progress Schedule.

Designate a Project Scheduler who will be responsible for scheduling the Work and submit a professional resume describing a minimum of three years of scheduling experience on interstate-highway reconstruction work of similar size and complexity, including recent experience with P6. Obtain approval of the submitted resume prior to scheduling the work.

With each Monthly CPM Progress Schedule Update also include:

- Activities underway and as-built dates for the past month.
- On a monthly basis, agree on the as-built dates with the department depicted in the Monthly CPM Progress Schedule Update or document any disagreements. Use the

as-built dates from the Monthly CPM Progress Schedule Update for the month when updating the CPM schedule.

- Provide actual as-built dates for completed activities through final acceptance of the project.

SEF Rev. 13_0812

32. Pay Plan Quantity.

A Bid Items Designated as Pay Plan Quantity

Replace standard spec 109.1.1.2 with the following:

If the schedule of items designates a bid item with a ****P**** in the title, the department will not measure that bid item. The department will use the plan quantity, the approximate quantity shown on the schedule of items, for payment unless a contract revision affects a designated bid item.

If the engineer revises the contract under standard spec 104.2, the department will adjust the quantity of designated items that are affected by the revised work. The engineer will adjust the affected quantity, with a contract modification as defined in standard spec 101.3, regardless of the magnitude of the revised work, which may result in either an increase or a decrease from the quantity shown on the schedule of items. The department will measure revised work as specified in standard spec 109.1.1.1. If the engineer revises the contract to eliminate a designated item, the engineer will not pay for the designated item, except as specified in standard spec 109.5.

The approximate quantity shown on the schedule of items for a designated item is for information only and only an estimate. The engineer makes no guarantee that the quantity, which can be determined by computations based on contract information, will equal the approximate quantity shown on the schedule of items. The engineer will not make a quantity adjustment for discrepancies.

SEF Rev. 12_0510

33. Force Account.

Supplement standard spec 109.4.5.1 (3)1 with the following:

Include accumulation of wages to date for each employee performing force account work and identify allowable Federal Unemployment Tax (FUTA) and State Unemployment Tax (SUTA) multipliers.

SEF Rev. 13_0228

34. Pavement Breaking Equipment.

Use only hydraulic pavement breaking equipment for breaking pavement within 300 ft. of any structure. Do not use guillotine, drop hammer, falling weight, gravity impact breakers or

equivalent equipment. A multi-head hydraulic drop hammer is allowed unless a structure is within 50 feet of the roadway.

SEF Rev. 14_0415

35. Removing or Abandoning Miscellaneous Structures.

Standard spec 204.5.1(3) is deleted in its entirety and replaced with the following:

When backfilling with Backfill Granular as specified in this special provision articles or as directed by the engineer, the item Backfill Granular is considered incidental to the appropriate bid item.

At locations where Backfill Granular is not specified, contractor may choose to use either Backfill or Backfill Granular, and no separate payments will be made for using Backfill Granular.

SEF Rev. 13_0122

36. Concrete Maturity Testing.

A Description

This special provision requires using concrete maturity testing to determine strength for project control of concrete pavement, falsework removal, and structural concrete under the designated subsections of the standard specifications as follows:

Duration of the curing period	standard spec 415.3.12
Duration of the cold weather protection period	standard spec 415.3.13
Opening to service	standard spec 415.3.15
Removing falsework	standard spec 502.3.4.2
Duration of the required curing period	standard spec 502.3.8
Duration of the cold weather protection period	standard spec 502.3.9
Opening to service	standard spec 502.3.10.1

The requirement for determining strength by the concrete maturity testing method supersedes all provisions for strength determination by other methods or provisions based on equivalent days within those designated subsections. The concrete maturity testing requirement also applies to all other provisions referencing strength determination under these designated subsections.

B Materials

Provide a maturity testing system that uses data-encrypted sensor devices permanently embedded in the field-placed concrete. Data-encrypted sensors have a chip that records both temperature and time information that can be downloaded to a reading device not permanently attached to those sensors.

Provide the department with a maturity reading device for each maturity testing system utilized on the project. Devices provided for the department use will become department property under the contract.

C Construction

Perform concrete maturity testing in accordance to standard spec 502.3.10.1.3.3. Develop a strength/maturity relationship for each concrete mix design used under the contract. Base that relationship on strength results of cylinders from pavement, appurtenant construction, ancillary concrete, or structural masonry units incorporated into the work and using those same mixes.

D (Vacant)**E Payment**

No additional payment will be made by the department for maturity testing.
SEF Rev. 14_0512

37. Field Facilities.

Replace standard spec 642 with the following:

The department has procured its own Field Facilities located at 2424 S. 102nd Street; West Allis, WI 53227.
SEF-ZOO IC 12_0723

38. QMP Base Aggregate.**A Description****A.1 General**

- (1) This special provision describes contractor quality control (QC) sampling and testing for base aggregates, documenting those test results, and documenting related production and placement process changes. This special provision also describes department quality verification (QV), independent assurance (IA), and dispute resolution.
- (2) Conform to standard spec 301, standard spec 305, and standard spec 310 as modified here in this special provision. Apply this special provision to material placed under all of the Base Aggregate Dense and Base Aggregate Open Graded bid items, except do not apply this special provision to material classified as reclaimed asphaltic pavement placed under the Base Aggregate Dense bid items.
- (3) Do not apply this special provision to material placed under the Aggregate Detours, Salvaged Asphaltic Pavement Base, Breaker Run, Select Crushed, Pit Run, Subbase, or Riprap bid items.
- (4) Provide and maintain a quality control program, defined as all activities related to and documentation of the following:
 1. Production and placement control and inspection.
 2. Material sampling and testing.

- (5) Chapter 8 of the department's construction and materials manual (CMM) provides additional detailed guidance for QMP work and describes required sampling and testing procedures. The contractor may obtain the CMM from the department's web site at:

<http://roadwaystandards.dot.wi.gov/standards/cmm/index.htm>

A.2 Contractor Testing for Small Quantities

- (1) The department defines a small quantity, for each individual Base Aggregate bid item, as a plan quantity of 9000 tons or less of material as shown in the schedule of items under that bid item.
- (2) The requirements under this special provision apply equally to a small quantity for an individual bid item except as follows:

1. The contractor need not submit a full quality control plan but shall provide an organizational chart to the engineer including names, telephone numbers, and current certifications of all persons involved in the quality control program for material under affected bid items.

2. Divide the aggregate into uniformly sized sublots for testing as follows:

Plan Quantity	Minimum Required Testing
≤ 1500 tons	One test from production, load-out, or placement at the contractor's option ^[1]
> 1500 tons and ≤ 6000 tons	Two tests of the same type, either from production, load-out, or placement at the contractor's option ^[1]
> 6000 tons and ≤ 9000 tons	Three placement tests ^{[2][3]}

- ^[1] If using production tests for acceptance, submit test results to the engineer for review prior to incorporating the material into the work. Production test results are valid for a period of 3 years.

- ^[2] For 3-inch material, obtain samples at load-out.

- ^[3] If the actual quantity overruns 9000 tons, create overrun sublots to test at a rate of one additional placement test for each 3000 tons, or fraction of 3000 tons, of overrun.

3. No control charts are required. Submit aggregate load-out and placement test results to the engineer within one business day of obtaining the sample. Assure that all properties are within the limits specified for each test.
 4. Department verification testing is optional for quantities of 6000 tons or less.
- (3) Material represented by a subplot with any property outside the specification limits is nonconforming. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

B Materials

B.1 Quality Control Plan

- (1) Submit a comprehensive written quality control plan to the engineer at or before the pre-construction meeting. Do not place base before the engineer reviews and comments on the plan. Construct the project as that plan provides.

- (2) Do not change the quality control plan without the engineer's review. Update the plan with changes as they become effective. Provide a current copy of the plan to the engineer and post in each of the contractor's laboratories as changes are adopted. Ensure that the plan provides the following elements:
 1. An organizational chart with names, telephone numbers, current certifications and/or titles, and roles and responsibilities of QC personnel.
 2. The process used to disseminate QC information and corrective action efforts to the appropriate persons. Include a list of recipients, the communication means that will be used, and action time frames.
 3. A list of source and processing locations, section and quarter descriptions, for all aggregate materials requiring QC testing.
 4. Test results for wear, sodium sulfate soundness, freeze/thaw soundness, and plasticity index of all aggregates requiring QC testing. Obtain this information from the region materials unit or from the engineer.
 5. Descriptions of stockpiling and hauling methods.
 6. Locations of the QC laboratory, retained sample storage, and where control charts and other documentation is posted.
 7. An outline for resolving a process control problem. Include responsible personnel, required documentation, and appropriate communication steps.

B.2 Personnel

- (1) Have personnel certified under the department's highway technician certification program (HTCP) perform sampling, testing, and documentation as follows:

Required Certification Level:	Sampling or Testing Roles:
Aggregate Technician IPP Aggregate Sampling Technician Aggregate Assistant Certified Technician (ACT-AGG)	Aggregate Sampling ^[1]
Aggregate Technician IPP Aggregate Assistant Certified Technician (ACT-AGG)	Aggregate Gradation Testing, Aggregate Fractured Particle Testing, Aggregate Liquid Limit and Plasticity Index Testing

^[1] Plant personnel under the direct observation of an aggregate technician certified at level one or higher may operate equipment to obtain samples.

- (2) A certified technician must coordinate and take responsibility for the work an ACT performs. Have a certified technician ensure that all sampling and testing is performed correctly, analyze test results, and post resulting data. No more than one ACT can work under a single certified technician.

B.3 Laboratory

- (1) Perform QC testing at a department-qualified laboratory. Obtain information on the Wisconsin laboratory qualification program from:

Materials Management Section
3502 Kinsman Blvd.
Madison, WI 53704
Telephone: (608) 246-5388
<http://www.dot.state.wi.us/business/engrserv/lab-qualification.htm>

B.4 Quality Control Documentation

B.4.1 General

- (1) Submit base aggregate placement documentation to the engineer within 10 business days after completing base placement. Ensure that the submittal is complete, neatly organized, and includes applicable project records and control charts.

B.4.2 Records

- (1) Document all placement observations, inspection records, and control adjustments daily in a permanent field record. Also include all test results in the project records. Provide test results to the engineer within 6 hours after obtaining a sample. For 3-inch base, extend this 6-hour limit to 24 hours. Post or distribute tabulated results using a method mutually agreeable to the engineer and contractor.

B.4.3 Control Charts

- (1) Plot gradation and fracture on the appropriate control chart as soon as test results are available. Format control charts according to CMM 8.30. Include the project number on base placement control charts. Maintain separate control charts for each base aggregate size, source or classification, and type.
- (2) Provide control charts to the engineer within 6 hours after obtaining a sample. For 3-inch base, extend this 6-hour limit to 24 hours. Post or distribute charts using a method mutually agreeable to the engineer and contractor. Update control charts daily to include the following:
 1. Contractor individual QC tests.
 2. Department QV tests.
 3. Department IA tests.
 4. Four-point running average of the QC tests.
- (3) Except as specified under B.8.2.1 for nonconforming QV tests, include only QC tests in the running average. The contractor may plot process control or informational tests on control charts, but do not include these tests, conforming QV tests, or IA tests in the running average.

B.5 Contractor Testing

- (1) Test gradation, fracture, liquid limit and plasticity index during placement for each base aggregate size, source or classification, and type.
- (2) Test gradation once per 3000 tons of material placed. Determine random sample locations and provide those sample locations to the engineer. Obtain samples after the material has been bladed, mixed, and shaped but before compacting; except collect 3-

inch samples from the stockpile at load-out. Do not sample from material used to maintain local traffic or from areas of temporary base that will not have an overlying pavement. On days when placing only material used to maintain local traffic or only temporary base that will not have an overlying pavement, no placement testing is required.

- (3) Split each contractor QC sample and identify it according to CMM 8.30. Retain the split for 7 calendar days in a dry, protected location. If requested for department comparison testing, deliver the split to the engineer within one business day.
- (4) The engineer may require additional sampling and testing to evaluate suspect material or the technician's sampling and testing procedures.
- (5) Test fracture for each gradation test until the fracture running average is above the lower warning limit. Subsequently, the contractor may reduce the frequency to one test per 10 gradation tests if the fracture running average remains above the warning limit.
- (6) Test the liquid limit and plasticity index for the first gradation test. Subsequently, test the liquid limit and plasticity index a minimum of once per 10 gradation tests.

B.6 Test Methods

B.6.1 Gradation

- (1) Test gradation using a washed analysis conforming to the following as modified in CMM 8.60:
Gradation..... AASHTO T 27
Material finer than the No. 200 sieve..... AASHTO T 11
- (2) For 3-inch base, if 3 consecutive running average points for the percent passing the No. 200 sieve are 8.5 percent or less, the contractor may use an unwashed analysis. Wash at least one sample out of 10. If a single running average for the percent passing the No. 200 sieve exceeds 8.5 percent, resume washed analyses until 3 consecutive running average points are again 8.5 percent passing or less.
- (3) Maintain a separate control chart for each sieve size specified in standard spec 305 or standard spec 310 for each base aggregate size, source or classification, and type. Set control and warning limits based on the standard specification gradation limits as follows:
 1. Control limits are at the upper and lower specification limits.
 2. There are no upper warning limits for sieves allowing 100 percent passing and no lower control limits for sieves allowing 0 percent passing.
 3. Dense graded warning limits, except for the No. 200 sieve, are 2 percent within the upper and lower control limits. Warning limits for the No. 200 sieve are set 0.5 percent within the upper and lower control limits.
 4. Open graded warning limits for the 1-inch, 3/8-inch, and No. 4 sieves are 2 percent within the upper and lower control limits. Upper warning limits for the No. 10, No. 40, and No. 200 sieves are 1 percent inside the upper control limit.

B.6.2 Fracture

- (1) Test fracture conforming to CMM 8.60. The engineer will waive fractured particle testing on quarried stone.
- (2) Maintain a separate fracture control chart for each base aggregate size, source or classification, and type. Set the lower control limit at the contract specification limit, either specified in another special provision or in table 301-2 of standard spec 301.2.4.5. Set the lower warning limit 2 percent above the lower control limit. There are no upper limits.

B.6.3 Liquid Limit and Plasticity

- (1) Test the liquid limit and plasticity according to AASHTO T 89 and T 90.
- (2) Ensure the material conforms to the limits specified in standard spec table 301-2.

B.7 Corrective Action

B.7.1 General

- (1) Consider corrective action when the running average trends toward a warning limit. Take corrective action if an individual test exceeds the contract specification limit. Document all corrective actions both in the project records and on the appropriate control chart.

B.7.2 Placement Corrective Action

- (1) Do not blend additional material on the roadbed to correct gradation problems.
- (2) Notify the engineer whenever the running average exceeds a warning limit. When 2 consecutive running averages exceed a warning limit, the engineer and contractor will discuss appropriate corrective action. Perform the engineer's recommended corrective action and increase the testing frequency as follows:
 1. For gradation, increase the QC testing frequency to at least one randomly sampled test per 1000 tons placed.
 2. For fracture, increase the QC testing frequency to at least one test per gradation test.
- (3) If corrective action improves the property in question such that the running average after 4 additional tests is within the warning limits, the contractor may return to the testing frequency specified in B.5.3. If corrective action does not improve the property in question such that the running average after 4 additional individual tests is still in the warning band, repeat the steps outlined above starting with engineer notification.
- (4) If the running average exceeds a control limit, material starting from the first running average exceeding the control limit and ending at the first subsequent running average inside the control limit is nonconforming and subject to pay reduction.

- (5) For individual test results significantly outside the control limits, notify the engineer, stop placing base, and suspend other activities that may affect the area in question. The engineer and contractor will jointly review data, data reduction, and data analysis; evaluate sampling and testing procedures; and perform additional testing as required to determine the extent of potentially unacceptable material. The engineer may direct the contractor to remove and replace that material. Individual test results are significantly outside the control limits if meeting one or more of the following criteria:
 1. A gradation control limit for the No. 200 sieve is exceeded by more than 3.0 percent.
 2. A gradation control limit for any sieve, except the No. 200, is exceeded by more than 5.0 percent.
 3. The fracture control limit is exceeded by more than 10.0 percent.

B.8 Department Testing

B.8.1 General

- (1) The department will conduct verification testing to validate the quality of the product and independent assurance testing to evaluate the sampling and testing. The department will provide the contractor with a listing of names and telephone numbers of all QV and IA personnel for the project, and provide test results to the contractor within 2 business days after the department obtains the sample.

B.8.2 Verification Testing

B.8.2.1 General

- (1) The department will have an HTCP technician, or ACT working under a certified technician, perform QV sampling and testing. Department verification testing personnel must meet the same certification level requirements specified in B.2 for contractor testing personnel for each test result being verified. The department will notify the contractor before sampling so the contractor can observe QV sampling.
- (2) The department will conduct QV tests of each base aggregate size, source or classification, and type during placement conforming to the following:
 1. One non-random test on the first day of placement.
 2. At least one random test per 30,000 tons, or fraction of 30,000 tons, placed.
- (3) The department will sample randomly, at locations independent of the contractor's QC work, collecting one sample at each QV location. The department will collect QV samples after the material has been bladed, mixed, and shaped but before compacting; except, for 3-inch aggregates, the department will collect samples from the stockpile at load-out. The department will split each sample, test half for QV, and retain half.
- (4) The department will conduct QV tests in a separate laboratory and with separate equipment from the contractor's QC tests. The department will use the same methods specified for QC testing.

- (5) The department will assess QV results by comparing to the appropriate specification limits. If QV test results conform to the specification, the department will take no further action. If QV test results are nonconforming, add the QV to the QC test results as if it were an additional QC test.

B.8.3 Independent Assurance

- (1) Independence assurance is unbiased testing the department performs to evaluate the department's QV and the contractor's QC sampling and testing including personnel qualifications, procedures, and equipment. The department will perform an IA review according to the department's independent assurance program. That review may include one or more of the following:
 1. Split sample testing.
 2. Proficiency sample testing.
 3. Witnessing sampling and testing.
 4. Test equipment calibration checks.
 5. Reviewing required worksheets and control charts.
 6. Requesting that testing personnel perform additional sampling and testing.
- (2) If the department identifies a deficiency, and after further investigation confirms it, correct that deficiency. If the contractor does not correct or fails to cooperate in resolving identified deficiencies, the engineer may suspend placement until action is taken. Resolve disputes as specified in B.9.

B.9 Dispute Resolution

- (1) The engineer and contractor should make every effort to avoid conflict. If a dispute between some aspect of the contractor's and the engineer's testing program does occur, seek a solution mutually agreeable to the project personnel. The department and contractor may review the data, examine data reduction and analysis methods, evaluate sampling and testing procedures, and perform additional testing. Use ASTM E 178 to evaluate potential statistically outlying data.
- (2) Production test results, and results from other process control testing, may be considered when resolving a dispute.
- (3) If the project personnel cannot resolve a dispute, and the dispute affects payment or could result in incorporating non-conforming product, the department will use third party testing to resolve the dispute. The department's central office laboratory, or a mutually agreed on independent testing laboratory, will provide this testing. The engineer and contractor will abide by the results of the third party tests. The party in error will pay service charges incurred for testing by an independent laboratory. The department may use third party test results to evaluate the quality of questionable materials and determine the appropriate payment. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

C (Vacant)

D (Vacant)

E Payment

- (1) Costs for all sampling, testing, and documentation required under this special provision are incidental to this work. If the contractor fails to perform the work required under this special provision, the department may reduce the contractor's pay. The department will administer pay reduction under the non-performance of QMP administrative item.
- (2) For material represented by a running average exceeding a control limit, the department will reduce pay by 10 percent of the contract price for the affected Base Aggregate bid items listed in subsection A. The department will administer pay reduction under the Nonconforming QMP Base Aggregate Gradation or Nonconforming QMP Base Aggregate Fracture Administrative items. The department will determine the quantity of nonconforming material as specified in B.7.2.

301-010 (20100709)

39. QMP HMA Pavement Nuclear Density.

A Description

Replace standard spec 460.3.3.2 (1) and standard spec 460.3.3.2 (4) with the following:

- (1) This special provision describes density testing of in-place HMA pavement with the use of nuclear density gauges. Conform to standard spec 460 as modified in this special provision.
- (2) Provide and maintain a quality control program defined as all activities and documentation of the following:
 1. Selection of test sites.
 2. Testing.
 3. Necessary adjustments in the process.
 4. Process control inspection.
- (3) Chapter 8 of the department's construction and materials manual (CMM) provides additional detailed guidance for QMP work and describes required procedures. Obtain the CMM from the department's web site at:
<http://roadwaystandards.dot.wi.gov/standards/cmm/index.htm>
- (4) The department's Materials Reporting System (MRS) software allows contractors to submit data to the department electronically, estimate pay adjustments, and print selected reports. Qualified personnel may obtain MRS software from the department's web site at:

<http://www.atwoodsystems.com/mrs>

B Materials

B.1 Personnel

- (1) Perform HMA pavement density (QC, QV) testing using a HTCP certified nuclear technician I, or a nuclear assistant certified technician (ACT-NUC) working under a certified technician.
- (2) If an ACT is performing sampling or testing, a certified technician must coordinate and take responsibility for the work an ACT performs. Have a certified technician ensure that all sampling and testing is performed correctly, analyze test results, and post resulting data. No more than one ACT can work under a single certified technician.

B.2 Testing

- (1) Conform to ASTM D2950 and CMM 8.15 for density testing and gauge monitoring methods. Perform nuclear gauge measurements using gamma radiation in the backscatter position. Perform each test for 4 minutes of nuclear gauge count time.

B.3 Equipment

B.3.1 General

- (1) Furnish nuclear gauges from the department's approved product list at <http://www.dot.wisconsin.gov/business/engrserv/approvedprod.htm>.
- (2) Have the gauge calibrated by the manufacturer or an approved calibration service within 12 months of its use on the project. Retain a copy of the manufacturer's calibration certificate with the gauge.
- (3) Prior to each construction season, and following any calibration of the gauge, the contractor must perform calibration verification for each gauge using the reference blocks located in the department's central office materials laboratory. To obtain information or schedule a time to perform calibration verification, contact the department's Radiation Safety Officer at:
Materials Management Section
3502 Kinsman Blvd.
Madison, Wisconsin 53704
Telephone: (608) 243-5998

B.3.2 Correlation of Nuclear Gauges

B.3.2.1 Correlation of QC and QV Nuclear Gauges

- (1) Select a representative section of the compacted pavement prior to or on the first day of paving for the correlation process. The section does not have to be the same mix design.
- (2) Correlate the 2 or more gauges used for density measurement (QC, QV). The QC and QV gauge operators will perform the correlation on 5 test sites jointly located. Record each density measurement of each test site for the QC, QV and back up gauges.

- (3) Calculate the average of the difference in density of the 5 test sites between the QC and QV gauges. Locate an additional 5 test sites if the average difference exceeds 1.0 lb/ft³. Measure and record the density on the 5 additional test sites for each gauge.
- (4) Calculate the average of the difference in density of the 10 test sites between the QC and QV gauges. Replace one or both gauges if the average difference of the 10 tests exceeds 1.0 lb/ft³ and repeat correlation process from B.3.2.1 (2).
- (5) Furnish one of the QC gauges passing the allowable correlation tolerances to perform density testing on the project.

B.3.2.2 Correlation Monitoring

- (1) After performing the gauge correlation specified in B.3.2.1, establish a project reference site approved by the department. Clearly mark a flat surface of concrete or asphalt or other material that will not be disturbed during the duration of the project. Perform correlation monitoring of the QC, QV, and all back-up gauges at the project reference site.
- (2) Conduct an initial 10 density tests with each gauge on the project reference site and calculate the average value for each gauge to establish the gauge's reference value. Use the gauge's reference value as a control to monitor the calibration of the gauge for the duration of the project.
- (3) Check each gauge on the project reference site a minimum of one test per day if paving on the project. Calculate the difference between the gauge's daily test result and its reference value. Investigate if a daily test result is not within 1.5 lb/ft³ of its reference value. Conduct 5 additional tests at the reference site once the cause of deviation is corrected. Calculate and record the average of the 5 additional tests. Remove the gauge from the project if the 5-test average is not within 1.5 lb/ft³ of its reference value established in B.3.2.2(2).
- (4) Maintain the reference site test data for each gauge at an agreed location.

B.4 Quality Control Testing and Documentation

B.4.1 Lot and Sublot Requirements

B.4.1.1 Mainline Traffic Lanes, Shoulders, and Appurtenances

- (1) A lot consists of the tonnage placed each day for each layer and target density specified in standard spec 460.3.3.1. A lot may include partial sublots.
- (2) Divide the roadway into sublots. A sublot is 1500 lane feet for each layer and target density.
- (3) A sublot may include HMA placed on more than one day of paving. Test sublots at the pre-determined random locations regardless of when the HMA is placed. No additional testing is required for partial sublots at the beginning or end of a day's paving.

- (4) If a resulting partial quantity at the end of the project is less than 750 lane feet, include that partial quantity with the last full subplot of the lane. If a resulting partial quantity at the end of the project is 750 lane feet or more, create a separate subplot for that partial quantity.
- (5) Randomly select test locations for each subplot as specified in CMM 8.15 prior to paving and provide a copy to the engineer. Locate and mark QC density test sites when performing the tests. Perform density tests prior to opening the roadway to traffic.
- (6) Use Table 1 to determine the number of tests required at each station, depending on the width of the lane being tested. When more than one test is required at a station, offset the tests 10 feet longitudinally from one another to form a diagonal testing row across the lane.

Lane Width	No. of Tests	Transverse Location
5 ft or less	1	Random
Greater than 5 ft to 9 ft	2	Random within 2 equal widths
Greater than 9 ft	3	Random within 3 equal widths

Table 1

B.4.1.2 Side Roads, Crossovers, Turn Lanes, Ramps, and Roundabouts

- (1) A lot represents a combination of the total daily tonnage for each layer and target density.
- (2) Each side road, crossover, turn lane, ramp, and roundabout must contain at least one subplot for each layer.
- (3) If a side road, crossover, turn lane, or ramp is 1500 feet or longer, determine sublots and random test locations as specified in B.4.1.1.
- (4) If a side road, crossover, turn lane, or ramp is less than 1500 feet long, determine sublots using a maximum of 750 tons per subplot and perform the number of random tests as specified in Table 2.

Side Roads, Turn Lanes, Crossovers, Ramps, Roundabouts: Sublot/Layer tonnage	Minimum Number of Tests Required
25 to 100 tons	1
101 to 250 tons	3
251 to 500 tons	5
501 to 750 tons	7

Table 2

B.4.2 Pavement Density Determination

B.4.2.1 Mainline Traffic Lanes and Appurtenances

- (1) Calculate the average subplot densities using the individual test results in each subplot.

- (2) If all subplot averages are no more than one percent below the target density, calculate the daily lot density by averaging the results of each random QC test taken on that day's material.
- (3) If any subplot average is more than one percent below the target density, do not include the individual test results from that subplot when computing the lot average density and remove that subplot's tonnage from the daily quantity for incentive. The tonnage from any such subplot is subject to disincentive pay according to standard spec 460.5.2.2.

B.4.2.2 Mainline Shoulders

B.4.2.2.1 Width Greater Than 5 Feet

- (1) Determine the pavement density as specified in B.4.2.1.

B.4.2.2.2 Width of 5 Feet or Less

- (1) If all subplot test results are no more than 3.0 percent below the minimum target density, calculate the daily lot density by averaging all individual test results for the day.
- (2) If a subplot test result is more than 3.0 percent below the target density, the engineer may require the unacceptable material to be removed and replaced with acceptable material or allow the nonconforming material to remain in place with a 50 percent pay reduction. Determine the limits of the unacceptable material according to B.4.3.

B.4.2.3 Side Roads, Crossovers, Turn Lanes, Ramps, and Roundabouts

- (1) Determine the pavement density as specified in B.4.2.1.

B.4.2.4 Documentation

- (1) Document QC density test data as specified in CMM 8.15. Provide the engineer with the data for each lot within 24 hours of completing the QC testing for the lot.

B.4.3 Corrective Action

- (1) Notify the engineer immediately when an individual test is more than 3.0 percent below the specified minimum in standard spec 460.3.3.1. Investigate and determine the cause of the unacceptable test result.
- (2) The engineer may require unacceptable material specified in B.4.3(1) to be removed and replaced with acceptable material or allow the nonconforming material to remain in place with a 50 percent pay reduction. Determine limits of the unacceptable area by measuring density of the layer at 50-foot increments both ahead and behind the point of unacceptable density and at the same offset as the original test site. Continue testing at 50-foot increments until a point of acceptable density is found as specified in standard spec 460.5.2.2(1). Removal and replacement of material may be required if extended testing is in a previously accepted subplot. Testing in a previously accepted subplot will not be used to recalculate a new lot density.

- (3) Compute unacceptable pavement area using the product of the longitudinal limits of the unacceptable density and the full subplot width within the traffic lanes or shoulders.
- (4) Retesting and acceptance of replaced pavement will be according to standard spec 105.3.
- (5) Tests indicating density more than 3.0 percent below the specified minimum, and further tests taken to determine the limits of unacceptable area, are excluded from the computations of the subplot and lot densities.
- (6) If 2 consecutive subplot averages within the same paving pass and same target density are more than one percent below the specified target density, notify the engineer and take necessary corrective action. Document the locations of such sublots and the corrective action that was taken.

B.5 Department Testing

B.5.1 Verification Testing

- (1) The department will have a HTCP certified technician, or ACT working under a certified technician, perform verification testing. The department will test randomly at locations independent of the contractor's QC work. The department will perform verification testing at a minimum frequency of 10 percent of the sublots and a minimum of one subplot per mix design. The sublots selected will be within the active work zone. The contractor will supply the necessary traffic control for the department's testing activities.
- (2) The QV tester will test each selected subplot using the same testing requirements and frequencies as the QC tester.
- (3) If the verification subplot average is not more than one percent below the specified minimum target density, use the QC tests for acceptance.
- (4) If the verification subplot average is more than one percent below the specified target density, compare the QC and QV subplot averages. If the QV subplot average is within 1.0 lb/ft^3 of the QC subplot average, use the QC tests for acceptance.
- (5) If the first QV/QC subplot average comparison shows a difference of more than 1.0 lb/ft^3 each tester will perform an additional set of tests within that subplot. Combine the additional tests with the original set of tests to compute a new subplot average for each tester. If the new QV and QC subplot averages compare to within 1.0 lb/ft^3 , use the original QC tests for acceptance.
- (6) If the QV and QC subplot averages differ by more than 1.0 lb/ft^3 after a second set of tests, resolve the difference with dispute resolution specified in B.6. The engineer will notify the contractor immediately when density deficiencies or testing precision exceeding the allowable differences are observed.

B.5.2 Independent Assurance Testing

- (1) Independent assurance is unbiased testing the department performs to evaluate the department's verification and the contractor's QC sampling and testing including personnel qualifications, procedures, and equipment. The department will perform the independent assurance review according to the department's independent assurance program.

B.6 Dispute Resolution

- (1) The testers may perform investigation in the work zone by analyzing the testing, calculation, and documentation procedures. The testers may perform gauge correlation according to B.3.2.1.
- (2) The testers may use correlation monitoring according to B.3.2.2 to determine if one of the gauges is out of tolerance. If a gauge is found to be out of tolerance with its reference value, remove the gauge from the project and use the other gauge's test results for acceptance.
- (3) If the testing discrepancy cannot be identified, the contractor may elect to accept the QV subplot density test results or retesting of the subplot in dispute within 48 hours of paving. Traffic control costs will be split between the department and the contractor.
- (4) If investigation finds that both gauges are in error, the contractor and engineer will reach a decision on resolution through mutual agreement.

B.7 Acceptance

- (1) The department will not accept QMP HMA Pavement Nuclear Density if a non-correlated gauge is used for contractor QC tests.

C (Vacant)

D (Vacant)

E Payment

E.1 QMP Testing

- (1) Costs for all sampling, testing, and documentation required under this special provision are incidental to the work. If the contractor fails to perform the work required under this special provision, the department may reduce the contractor's pay. The department will administer pay reduction under the Non-performance of QMP administrative item.

E.2 Disincentive for HMA Pavement Density

- (1) The department will administer density disincentives according to standard spec 460.5.2.2.

E.3 Incentive for HMA Pavement Density

- (1) Delete standard spec 460.5.2.3.

- (2) If the lot density is greater than the minimum specified in standard spec table 460-3 and all individual air voids test results for that mixture are within +1.0 percent or -0.5 percent of the design target in standard spec table 460-2, the department will adjust pay for that lot as follows:

Percent Lot Density Above Minimum	Pay Adjustment Per Ton
From -0.4 to 1.0 inclusive	\$0
From 1.1 to 1.8 inclusive	\$0.40
More than 1.8	\$0.80

- (3) The department will adjust pay under the Incentive Density HMA Pavement bid item. Adjustment under this item is not limited, either up or down, to the bid amount shown on the schedule of items.
- (4) If a traffic lane meets the requirements for disincentive, the department will not pay incentive on the integrally paved shoulder.
- (5) Submit density results to the department electronically using the MRS software. The department will validate all contractor data before determining pay adjustments.
460-020 (20100709)

40. Erosion Control.

Prepare and submit an Erosion Control Implementation Plan (ECIP) for the project including borrow sites, material disposal sites, and each dewatering, mechanical pumping, operation in accordance to Chapter TRANS 401, Wisconsin Administrative Code, and standard specification 107.20 requirements. The ECIP will supplement information shown on the plans and not reproduce it. The ECIP will identify how to implement the project's erosion control plan. Prepare the ECIP submittal in accordance to WisDOT Construction and Materials Manual (CMM), Chapter 6-45, Erosion Control and provide information enumerated in department worksheet, WS1073. ECIP will demonstrate timely and diligently staged operations, continuing all construction operations methodically from the initial removals and topsoil stripping operations through the subsequent grading, paving, and re-top soiling to minimize the period of exposure to possible erosion.

Provide the ECIP 14 days prior to the pre-construction conference. Provide 1 copy of the ECIP to the department and 1 copy of the ECIP to the WDNR Liaison (Kristina Betzold, (414) 507-4946, Kristina.betzold@wisconsin.gov). Do not implement the ECIP until department approval and perform all work in accordance to the approved ECIP.

Stockpile excess materials or spoils on upland areas away from wetlands, floodplains, and waterways. Immediately install perimeter silt fence protection around stockpiles. If stockpiled materials will be left for more than 14 days, install temporary seed or other temporary erosion control measures the engineer orders.

Re-topsoil graded areas, as designated by the engineer, immediately after grading is completed within those areas. Seed, fertilize, and mulch erosion mat top-soiled areas, as designated by the engineer, within 5 days after placement of topsoil. If graded areas are

left not completed and exposed for more than 14 days, seed those areas with temporary seed.

Do not allow any excavation for; structures, utilities, grading, maintaining drainage that requires dewatering (mechanical pumping) of water containing sediments (sand, silt, and clay particles) to leave the work site or discharge to a storm water conveyance system without sediment removal treatment. Prior to each dewatering operation, submit to the department a separate ECIP amendment describing in words and pictorial format an appropriate best management practice for sediment removal, in accordance to WisDNR Storm Water Construction Technical Standard, Code 1061, Dewatering. Include reasoning, location, and schedule duration proposed for each operation. Per Code 1061, include all selection criteria: site assessment, dewatering practice selection, calculations, plans, specifications, operations, maintenance, and location of proposed treated water discharge. Provide a stabilized discharge area. If directing discharge towards or into an inlet structure, provide additional inlet protection for back-up protection. Dewatering is considered incidental to the project.

SEF Rev. 14_08xx

41. Maintaining Drainage.

Maintain drainage at and through worksite during construction in accordance to standard specs 107.22, 204, 205 and 520.

Use existing storm sewers, existing culvert pipes, existing drainage channels, temporary culvert pipes, or temporary drainage channels to maintain existing surface and pipe drainage. Pumps may be required to drain the surface, pipe, and structure discharges during construction. Costs for furnishing, operating, and maintaining the pumps is considered incidental to the project.

Dewatering (Mechanical Pumping) for Bypass Water (sediment-free) Operations

If dewatering bypass operations are required from one pipe structure to another downstream pipe structure or from the upstream to downstream end of a culvert and the bypass flow is not transporting sediments (sand, silt, and clay particles) from a tributary work site area, bypass pumping operations will be allowed provided that the department has been made aware of and approves operation. When pumping bypass flows, the discharge location will need to be stable and not produce any erosion from the discharge velocity that would cause release of sediment downstream.

Dewatering (Mechanical Pumping) for treatment Water (sediment-laden) Operations

If dewatering operations require pumping of water containing sediments (sand, silt, and clay particles), the discharge will not be allowed to leave the work site or discharge to a storm water conveyance system without sediment removal treatment. Refer to Special Provision Erosion Control for these requirements.

SEF Rev. 14_08xx

42. Deep Pipe Installation.

Supplement standard spec 520.3.2.1(2) and standard spec 607.3.1.1(2) with the following:

For trench installations greater than 10 feet in depth, submit a shoring design and installation sequence identifying means and methods for meeting requirements for material testing, laying pipe, and backfilling. Have a professional engineer, registered in the state of Wisconsin and knowledgeable of the specific site conditions and requirements, verify the adequacy of the design and proposed materials and stamp the submittal.

SEF 12_1115

43. Control of Water.

This article addresses the provisions for controlling, handling, disposing and treating groundwater and surface water, including contaminated groundwater that may be encountered in building footing excavations, as required for performance of the work; maintaining the control of water facilities, including maintenance items such as the disposal of sludge from settling detention basins and treatment plants; and work necessary to repair or replace property damaged due to groundwater disturbance.

The contractor is responsible for designing, furnishing, installing and maintaining dewatering systems that accomplish continuous control of water at all times during the course of construction, and shall provide adequate backup systems to accomplish control of water. The method of control, handling, and disposal of groundwater and surface water shall be by whatever means are necessary to obtain satisfactory working conditions and to maintain the progress of the work.

All required drainage, pumping, treatment, and disposal shall be done without damage to adjacent property or structures and without interference with the operations of other contractors, or the rights of public and private owners, or pedestrian and vehicular traffic.

The contractor shall modify the water control system at his own expense if, after installation and while in operation, it causes or threatens to cause damage to adjacent property or to existing buildings, structures, or utilities.

Control of water is considered incidental to other items.

44. Furnishing and Planting Plant Materials.

Add the following to standard spec 632.2.2.1 (1):

All plants shall be grown within the states of Wisconsin, Minnesota, Michigan, or parts of northern Illinois located within Zone 5 of the "Plant Hardiness Zone Map" produced by the United States Department of Agriculture, Miscellaneous Publication No. 1475, issued January 2012.

45. Landscape Planting Surveillance and Care Cycles.

Amend standard spec 632.3.19.2 to include the following:

If the care specialist fails to perform any of the required care-cycles as specified in standard spec 632.3.19.1, the department will assess daily damages in the amount of \$500 per day to cover the cost of performing the work with other forces.

46. Gates Chain Link (40 Feet), Item 616.0329.0001; Gates Chain Link (50 Feet), Item 616.0329.0002.

Supplement standard spec 616.3.3.4 as follows:

Furnish and install cantilever sliding gate.

47. Lighting Control Cabinets 240/480 30-Inch, Item 659.2230.

Add the following to standard spec 659.2:

The lighting control cabinets 240/480 30-Inch shall be equipped with 1.5KVA, single phase, 60Hz, encapsulated, NEMA 1 rated and UL listed step-down transformer. The primary voltage shall be 240V and secondary voltage shall be 120V with 5% tapping. The transformer shall be capable of mounting inside the cabinet. SPST, 20 amp switch for the door shall be single pole single throw type heavy duty, temper resistant, rated for 125V, UL listed.

The cabinets shall be furnished with 60Watt, 120V lamp, UL listed incandescent lighting fixture.

Control breaker shall be 15 amps, single pole 120V, bolt on, UL listed. The circuit breaker shall have 10K AIR rating at 120V, terminal for minimum wire size 14 AWG and maximum wire size 8 AWG.

Furnish shop drawings as specified in 506.3.2, except submit 5 copies with the materials list. Ensure the drawings contain sufficient detail to allow satisfactory review and show the dimensions of all equipment shown in the plans.

48. EBS Excavation, Item SPV.0035.0100.

A Description

This special provision describes excavating and disposing of material removed at depths greater than 6-inches below building footings at locations determined by the engineer. Payment for footing excavation between the existing ground surface and 6-inches below building footings is not included in this bid item and is considered incidental to other items.

B Materials

Excavate all materials removed at depths greater than 6-inches below building footings not classified as rock, stone piles and stone fences, or marsh excavation. Perform work in accordance to standard spec 205.2.2 and as hereinafter provided.

C Construction

Perform work in accordance to the pertinent provisions of standard spec 205.3 and as hereinafter provided.

C.1 Yielding Areas

After rough grading on all or a portion of the building footings is complete, point out yielding areas to the engineer. The engineer will evaluate the yielding areas to determine if EBS Excavation is required.

Perform EBS Excavation in yielding areas as directed by the engineer.

C.2 Excavation

Excavate materials as directed by the engineer. Remove deposits of frost-heave material, unstable silty soils, wet and unstable soil, material salvaged from old road cores in marshes, topsoil containing considerable amounts of humus or vegetable matter, rocks, or other undesirable foundation material to the depth below finished grade as the engineer directs.

Compact, or prepare otherwise as required, the existing ground within the building foundation as necessary to support the building and attain the specified density.

Dispose of all excavated materials offsite at no expense to the department. Locate disposal sites outside the right-of-way and comply with all regulations relating to disposal of solid waste. Ensure that disposal sites are neatly constructed. In performing these operations, do not create a nuisance or cause pollution or siltation of natural watercourses, streams, lakes, wetlands, or reservoirs. Obtain written permits for disposal from the owner of the property where placing the material, unless disposing of the material at a licensed waste disposal operation. Furnish permits, or copies of permits, to the engineer before disposal. Do not deposit waste in wetlands.

D Measurement

The department will measure EBS Excavation by the cubic yard, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.0100	EBS Excavation	CY

Payment for EBS Excavation is full compensation for performing excavation removed at depths greater than 6-inches below building footings after receiving engineer approval; for the satisfactory disposal of all resulting material offsite; for obtaining and furnishing copies of permits; for control of water; for pointing out yielding areas.

The department will only pay for engineer-approved EBS Excavation to correct problems beyond the contractor's control. Work performed under standard spec 105.3 to correct unacceptable work is the contractor's responsibility.

49. EBS Backfill, Item SPV.0035.0101.

A Description

This special provision describes backfilling EBS Excavation with backfill slurry.

B Materials

Furnish all materials in accordance to standard spec 312.2 and as hereinafter provided.

Use Type I Portland Cement conforming to standard spec 501.2.1, fine aggregate and number 1 coarse aggregate conforming to standard spec 501.2.5, and water conforming to standard spec 501.2.4 in the backfill slurry mix. Weigh aggregates at a batch plant suitable for batching concrete masonry. Mix and deliver to the project site using a truck mixer. Add enough water to enable the mixture to flow readily. Submit a mix design for the engineers review prior to placement. Backfill slurry is considered as mix class III and the department accepts the mix by certification. Mix acceptance and testing in the field is not required.

C Construction

Place backfill slurry material where EBS Excavation was performed or as the engineer directs. Discharge from the truck in a manner to prevent segregation. Completely fill excavation in a single operation. Consolidation or compaction effort will not be required. Twelve hours shall elapse before construction activities can continue on top of the backfill.

D Measurement

The department will measure EBS Backfill in volume by the cubic yard of material, acceptably completed. Such volume will be computed from dimensions of the area to be backfilled.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.0101	EBS Backfill	CY

Payment for EBS Backfill is full compensation for furnishing and placing backfill slurry in areas of EBS Excavation; and for providing mix design.

The department will only pay for EBS Backfill at engineer-approved EBS Excavation locations. Work performed under standard spec 105.3 to correct unacceptable work is the contractor's responsibility.

50. Inlet Covers Type 57, Item SPV.0060.0001.

A Description

The work under these items shall be in accordance to the requirements of standard spec 611 and the details as shown on the plans.

B (Vacant)

C (Vacant)

D Measurement

The department will measure Inlet Cover (Type) by each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0001	Inlet Covers Type 57	Each

Payment is full compensation conforming to standard spec 611.5.

51. Inlet Covers Type R Special, Item SPV.0060.0002.

A Description

The work under these items shall be in accordance to the requirements of standard spec 611 and the details as shown on the plans.

B (Vacant)

C (Vacant)

D Measurement

The department will measure Inlet Covers (Type) by each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0002	Inlet Covers Type R Special	Each

Payment is full compensation conforming to standard spec 611.5.

52. Removing Sanitary Manholes, Item SPV.0060.0004.

A Description

This work includes removing existing sanitary manholes in accordance to the plans, the Standard Specifications for Highway and Structure Construction, latest edition and amendments, Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the “Special Provision Notes for Sanitary Sewer Work” as found in the plans, and as hereinafter provided and these special provisions.

B Materials

Granular backfill as required in Chapter 2.6.2 of the SSSW, shall conform to the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

C Construction

Remove the manhole in its entirety. Perform work in accordance to the pertinent specifications of standard spec 204. The contractor is responsible for the safe methods and sequence of controlled removal operations. Completely remove the existing manhole to the extent required to avoid interfering with new construction work as shown on plans and as directed by the engineer.

Abandon unused sewers not to be removed in accordance to Section 3.2.24 of the SSSW.

The cutting and removal of existing sanitary sewer manholes from within the trench of replacement sanitary sewer will not be paid for separately, but shall be considered incidental to the respective sanitary sewer item.

Provide granular backfill as required in Chapter 2.6.2 of the SSSW, meeting the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

Consolidate all backfill by mechanical compaction per specification 2.6.14(b) of the SSSW. Special compaction equipment and measures are required where standard compaction equipment cannot be utilized. Flooding of backfill will not be allowed. Compaction shall achieve uniform consolidation in conformance with section 2.6.14(b) of the SSSW.

Salvaged castings become the property of the contractor.

Provide by-pass pumping of wastewater round construction zone during working hours.

During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

D Measurement

The department will measure Removing Sanitary Manholes as a unit for each individual manhole, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0004	Removing Sanitary Manholes	Each

Payment is full compensation for providing all excavating; furnishing and installing all materials; for removing manhole; for abandoning unused sewers; for furnishing and placing granular backfill; for salvaging frames and covers; for hauling and disposing of all materials.

53. Reconstructing Sanitary Manholes, Item SPV. 0060.0005.

A Description

This work includes reconstructing existing sanitary manholes to grade as shown in the plans, reinstalling frame and cover, and installing external frame/chimney seal, in accordance to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW).

B Materials

Furnish precast manhole sections as described in section 3.5.3 of the SSSW of the height required to create a finished manhole according to plan elevations. Contractor shall verify manhole dimensions and vertical height adjustment prior to ordering materials.

Adjusting rings shall be reinforced concrete adjusting rings that are in accordance to Chapter 8.39.11 of the SSSW, and match the dimensions of existing rings and/or manhole castings. Minimum thickness for concrete rings shall be 2-Inches. Butyl joint sealant shall be placed between rings

New External Sanitary Manhole Seals, as manufactured by Adaptors, Inc. or equal, shall meet the material requirements of Chapter 8.42.0 and the performance requirements of Section 8.42.4 and 8.42.5 of the SSSW.

The flexible portion of the seal will be made from natural or synthetic rubber conforming to the applicable requirements of ASTM C-877. Metal parts such as bands used to compress the seal against the manhole or any screws, bolts, nuts or any other metal parts will be Type 304 stainless steel.

C Construction

Reconstruction includes removal of the frame, cover, casting, adjusting rings and cone, installation of new barrel sections of appropriate height, reinstallation of the cone, placement of new undamaged adjusting rings, and resetting of the frame and cover. Remove existing frames, covers, castings and manhole cone sections with care to prevent damage. All joints shall be water tight at the time of construction.

Mortar shall be used between all rings to hold them in place. Mortar shall also be used to coat the rings inside and outside of the manhole for water tightness.

Adjustment rings shall be concrete with steel reinforcement in conformance with ASTM C-478. Rings shall be 2 inches or 4 inches in thickness. The manholes shall be adjusted so that a minimum of two 2-inch rings are installed for adjustment. A maximum of 12 inches for adjustment will be allowed, but the top two rings shall be of 2-inch thickness. If the manhole ring adjustments are not within the limits stated, the manhole shall be reconstructed as identified below. Rubber ring gasket material shall be used between all rings to hold them in place. Mortar shall also be used to coat the rings inside and outside of the manhole for water tightness.

Manhole frames shall be centered on top of the cone.

External seals shall be installed on all reconstructed manholes in accordance to the manufacturer's recommended installation procedures.

Set the manhole frames so that they comply with the surface requirements of the SSSW. At the completion of the paving, a 6-foot straightedge shall be placed over the centerline of each manhole frame parallel to the direction of traffic. A measurement shall be made at each side of the frame. The two measurements shall be averaged. If this average is greater than 5/8 inches, reset the manhole frame to the correct plane and elevation. If this average is 5/8 inches or less but greater than 3/8 inches, the manhole frame shall be allowed to remain in place but shall be paid for at 50 percent of the contract unit price.

D Measurement

The department will measure Reconstructing Sanitary Manholes by each, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0005	Reconstructing Sanitary Manholes	Each

Payment is full compensation for removal of existing manhole cone section, frames, steps, cover and castings; for furnishing and installing additional precast concrete manhole sections, replacing covers, frames; for furnishing all excavation and backfill; for reinstalling manhole cone section and steps; for installing adjustment rings; for frame/chimney seals; for disposal of surplus material, cleanup, and for restoring site work. No additional monies will be paid to the contractor for replacement of existing manhole cone sections due to damage caused by the contractor's removal operations.

54. Adjusting Sanitary Manholes, Item SPV.0060.0006.

A Description

This work includes adjusting existing sanitary manholes to grade by adding or removing adjusting rings, reinstalling frame and cover, and installing external frame/chimney seal, in

accordance to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW).

B Materials

Adjusting rings shall be reinforced concrete adjusting rings that are in accordance to Chapter 8.39.11 of the SSSW, and match the dimensions of existing rings and/or manhole castings. Minimum thickness for concrete rings shall be 2-Inches. Butyl joint sealant shall be placed between rings

New External Sanitary Manhole Seals, as manufactured by Adaptors, Inc. or equal, shall meet the material requirements of Chapter 8.42.0 and the performance requirements of Section 8.42.4 and 8.42.5 of the SSSW.

The flexible portion of the seal will be made from natural or synthetic rubber conforming to the applicable requirements of ASTM C-877. Metal parts such as bands used to compress the seal against the manhole or any screws, bolts, nuts or any other metal parts will be Type 304 stainless steel.

C Construction

Mortar shall be used between all rings to hold them in place. Mortar shall also be used to coat the rings inside and outside of the manhole for water tightness.

Adjustment rings shall be concrete with steel reinforcement in conformance with ASTM C-478. Rings shall be 2 inches or 4 inches in thickness. The manholes shall be adjusted so that a minimum of two 2-inch rings are installed for adjustment. A maximum of 12 inches for adjustment will be allowed, but the top two rings shall be of 2-inch thickness. If the manhole ring adjustments are not within the limits stated, the manhole shall be reconstructed as identified below. Rubber ring gasket material shall be used between all rings to hold them in place. Mortar shall also be used to coat the rings inside and outside of the manhole for water tightness.

Manhole frames shall be centered on top of the cone.

External seals shall be installed on all reconstructed manholes in accordance to the manufacturer's recommended installation procedures.

Set the manhole frames so that they comply with the surface requirements of the SSSW. At the completion of the paving, a 6-foot straightedge shall be placed over the centerline of each manhole frame parallel to the direction of traffic. A measurement shall be made at each side of the frame. The two measurements shall be averaged. If this average is greater than 5/8 inches, reset the manhole frame to the correct plane and elevation. If this average is 5/8 inches or less but greater than 3/8 inches, the manhole frame shall be allowed to remain in place but shall be paid for at 50 percent of the contract unit price.

D Measurement

The department will measure Adjusting Sanitary Manholes as a unit per each adjustment, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.00060.0006	Adjusting Sanitary Manholes	Each

Payment is full compensation for providing the frame/chimney seal joint including the manufactured frame/chimney seal, bands, screws, bolts, nuts, mortar, adhesive, and all labor tools and equipment required to complete the installation according to the manufacturer's recommended installation procedures; for removing, reinstalling and adjusting the covers; for disposal of all surplus or waste material; and for site cleanup.

55. Connecting Sanitary Lateral 6-inch, Item SPV.0060.0007.**A Description**

This work includes installing and connecting sanitary sewer lateral to an existing sanitary sewer main, including installing a 8-Inch x 6-Inch wye connection, and other fittings as necessary to complete the work in accordance to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest Edition.

B Materials**B.1 General**

All materials and work required to connect the sanitary sewer lateral will conform to the Standard Specifications for Sewer and Water.

B.2 Lateral Connection

The contractor shall use prefabricated wyes. Pipe material shall be PVC SDR-35 conforming to ASTM D-3034, with rubber gasket joints conforming to ASTM F-477.

B.3 Joint

Joints on sanitary sewers between dissimilar pipe shall be either a non-shear coupling as manufactured by DFW/HPI or shall be made with flexible mechanical compression joint coupling conforming to ASTM C-594 Type B with stainless steel bands and shear ring conforming to ASTM A-167 as manufactured by Joints, Inc. (Calder) of Gardena, CA; Fernco Joint Sealer Co. of Ferndale, MI., or equal and in addition, using a transitional bushing conforming to ASTM C-594 Type B when pipe with different outside diameters are to be connected.

Encased the coupling in a minimum of 6 inches of concrete around the entire repair coupling and at least 12 inches from each side of the joint. Joints for reconnecting laterals of similar PVC SDR-35 pipe shall be made with new PVC SDR-35 gasketed pipe.

The cost of connecting dissimilar pipe materials with nonshear flexible compression coupling is incidental to the cost of sanitary sewer pipe.

C (Vacant)

D Measurement

The department will measure Connecting Sanitary Lateral 6-inch as a unit for each individual lateral connection, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0007	Connecting Sanitary Lateral 6-inch	Each

Payment is full compensation for furnishing all materials including joints and wye connections; for excavating, backfilling, and compacting; for disposing of surplus materials.

56. Removing Existing Foundation, Item SPV.0060.0010.

A Description

This special provision describes removing existing footings from the temporary storage facility, disposing of resulting materials and backfilling in accordance to standard spec 204 and as herein provided.

B (Vacant)

C Construction

Remove and dispose of the existing footings. The footings are approximately 24 inches in diameter and 6 feet deep. The footings may contain reinforcement material as well as structural members.

Conform to standard spec 204.3.

D Measurement

The department will measure Removing Existing Foundation as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0010	Removing Existing Foundation	Each

Conform to standard spec 204.5.1 (2).

57. Installing County Furnished Keypad, Item SPV.0060.0011.

A Description

This special provision describes the installation of a county furnished keypad for building security.

B Materials

Use materials furnished by Milwaukee County. Milwaukee County will provide notification at the preconstruction meeting of the keypad vendor and provide the vendor's contact information.

C Construction

Perform the work in accordance to the manufacturer's requirements

Perform all testing required by the manufacturer. Provide all testing documentation.

D Measurement

The department will measure Installing County Furnished Keypad as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0011	Installing County Furnished Keypad	Each

Payment is full compensation for picking up, installing and testing the Keypad; for furnishing and installing all other items necessary (such as wire nuts, connectors, tape, etc.) to make the proposed system complete; and for clean-up and waste disposal.

58. Parking Lot Bollard, Item SPV.0060.0019.

A Description

This special provision describes providing and installing parking lot bollards as shown on the plans and as hereinafter provided.

B Materials

Furnish materials conforming to the following:

- Round steel pipe of the size shown in the plans, conforming to standard spec 506.2.3.6.
- Concrete Masonry Grade A, conforming to standard spec 501.
- Epoxy paint system conforming to standard spec 517.

C Construction

Embed steel pipe in augured hole backfilled with concrete as shown in the plans. Set pipe plumb vertical. Brace pipe if necessary during and after concrete placement, to maintain

plumb vertical orientation until concrete attains sufficient strength. Fill pipe with concrete and finish concrete with a smooth rounded top at the top of the pipe as shown in the plans.

Paint with finished top coat color as shown in the plans. Paint may be applied in the field.

D Measurement

The department will measure Parking Lot Bollard by each individual installed unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0019	Parking Lot Bollard	Each

Payment is full compensation for furnishing, installing and painting the parking lot bollard.

59. Mayfair Pond Outlet Storm Sewer Structure Reconstruction, Item SPV.0060.0020.

A Description

Reconstruct pond outlet Storm Sewer Structure. Reconstruct Mayfair Pond Outlet Storm Sewer Structure in accordance to the pertinent provisions of standard spec 611, as shown on the plans and as hereinafter provided. Reinstall trash rack on the outlet Storm Sewer Structure. Install trash rack in accordance to the pertinent provisions of standard spec 506 and standard spec 513, as shown on the plans and as hereinafter provided

B Materials

Furnish manhole materials in accordance to standard spec 611.

Furnish steel conforming to the requirements of standard spec 506.2.2.1. Furnish steel galvanized in accordance to ASTM A123 and ASTM 1153 as applicable.

Furnish bolts, nuts and washers for the installation of the trash rack onto the Outlet Storm Sewer Structure. Bolts, nuts and washers in accordance to standard spec 513.2.2.5.

C Construction

Remove and salvage trash rack. Remove 8" flat slab top with 60" x 60" orifice and replace with an 8" flat slab top with 20" x 20" orifice. Reinstall the trash rack onto the Outlet Storm Sewer Structure.

D Measurement

The department will measure Mayfair Pond Outlet Storm Sewer Structure Reconstruction as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0020	Mayfair Pond Outlet Storm Sewer Structure Reconstruction	Each

Payment is full compensation for providing and placing all materials, including all masonry, steel and pipe connections, other fittings, and reinstalling trash rack.

60. Removing and Stockpiling Light Poles, Arms and Luminaires, Item SPV.0060.0021.

A Description

The work under this item consists of removing existing lighting units as shown on the plans. Removal of the concrete pole base will be paid under a separate bid item. The poles, arms and luminaires shall be delivered to and stockpiled at the central water tower located behind the Charles Landis Mental Health Complex at 9455 W. Watertown Plank Road, Wauwatosa, WI and turned over the Milwaukee County DPW, Electrical Department. Coordinate turning over the light poles, arms and luminaires including lamps with Mr. John Bieganski, phone number (414) 257-7072. The lighting units shall be uninstalled and disabled. All materials shall be handled, packaged and delivered in a manner that they are not damaged.

B (Vacant)**C Construction**

Concrete pole bases will be paid separately under bid item Remove Concrete Bases, 204.0195. Dispose of all additional materials off site.

D Measurement

The department will measure Removing and Stockpiling Light Poles, Arms and Luminaires as each individual light pole, acceptably removed and stockpiled.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0021	Removing and Stockpiling Light Poles, Arms and Luminaires	Each

Payment is full compensation for furnishing all the work under this bid item and disposal of waste material.

61. Conveyor, Item SPV.0060.0101.

A Description

This special provision describes designing, furnishing and installing a 24-inch wide dome loading belt conveyor mounted to a salt storage dome including pit, below grade hopper and control gate system, skirt boards, conveyor covers outside the dome, electric drive motor, lubricants and greases of the system, and appurtenances; excavating and backfilling in accordance to standard spec 206; proportioning, mixing, placing, and protecting concrete in accordance to standard spec 501; furnishing and placing reinforcement in accordance to standard spec 505; and as specified herein.

The dome loading belt conveyor system shall carry a minimum five year manufacturer's warranty.

A.1 Quality Assurance

Manufacturer:

The manufacturer of the dome loading conveyor shall be a business regularly engaged in the manufacture, assembly, and installation of equipment required for this project. The manufacturer shall have at least five years of successful experience in providing design and installation of the type of system required for this project.

Materials:

Provide materials that have a proven performance record. The contractor is responsible for all products, components, accessories, and methods used in fabrication and installation of the conveyor system.

The applicable codes, requirements and regulations of the following organizations for material quality, fabrication, and installation procedures shall be met or exceeded. Where requirements differ among these sources, the most rigid shall apply.

- American Society of Mechanical Engineers (ASME)
- Conveyor Equipment Manufacturer's Association (CEMA)
- American Society of Testing and Materials (ASTM)
- American Institute of Steel Construction (AISC)
- American Welding Society (AWS)
- National Electric Code (NEC)

A.2 Submittals

Submit all pertinent shop drawings and structural design information, descriptive material and outline sketches showing principal dimensions and parts for the conveyor, and maintenance and service information for the principal components to the engineer and representative of the Milwaukee County Department of Public Works prior to ordering and installing any materials required for the work.

The engineer and representative of the Milwaukee County Department of Public Works must approve all materials, design information and submittals prior to the contractor ordering and installing any materials required for the work.

B Materials

B.1 General

Furnish a conveyor used to load salt into a salt storage dome. It shall have a capacity of 200 tons/hour minimum as calculated in conformance with the CEMA publication "Belt Conveyors for Bulk Materials". For the purposes of this specification, salt is defined being free flowing and having a bulk density of 80 PCF with an angle of repose of 32 degrees.

The salt storage dome loading conveyor shall be inclined at an angle of 28 degrees. The head pulley shall be fitted with automatic lubricators. The drive unit shall be located above grade, near ground level, for easier maintenance.

The steel conveyor supports and frames, the hopper and steel supports shall be fabricated from ASTM A-36. All these items shall be hot-dip galvanized after fabrication or stainless steel.

The idlers, pulleys and drive components shall be painted in accordance to the manufacturer's recommended paint system.

Carrying idlers shall be 35 degree troughing, CEMA "B".

Return idlers shall be steel, CEMA "B".

B.2 Loading Belt

Furnish a 24-inch wide, cleated conveyor belt used to load salt with the cleats shaved beneath the skirt boards. Supply a stainless steel belt splice kit that includes template, punch, bolt-cutting tools and wrenches for the installation of the belt splice.

B.3 Pit and Below Grade Hopper

The conveyor pit shall be designed to unload trucks. The trucks shall unload by advancing into position over the pit hopper. After unloading they shall again advance to clear the hopper area for the next truck.

The pit hopper opening shall be covered with a galvanized steel grating capable of supporting truck traffic. The top of the hopper shall be elevated 6" above the finished grade.

The conveyor pit shall be made of reinforced concrete conforming to standard spec 501 and standard spec 505. Design the pit to resist the weight (i.e., forces) of salt against it. Provide design calculations showing that the proposed pit system meets loading and code requirements and is stamped and signed by a licensed professional engineer registered in the State of Wisconsin.

All fabricated steel shall be hot-dip galvanized after fabrication or stainless steel. All field connections shall be bolted.

A vibrator mounting plate shall be installed on the hopper. The plate shall be suitable for mounting a rotary vibrator.

The below grade hopper shall be supported on an A36 steel frame. The minimum plate thickness shall be 1/4".

The hopper shall have a top opening of 9'-0" x 4'-0" and shall be covered by heavy-duty galvanized grating. The hopper shall be equipped with an adjustable gate.

B.4 Skirt Boards

Furnish rubber skirt boards on the loading belt conveyor at the transfer point beneath the hopper.

B.5 Cover

The loading belt conveyor located outside the salt storage dome shall be equipped with galvanized covers.

B.6 Drive Motor

The loading belt conveyor shall have electric motors. The drive horsepower requirement shall be calculated in conformance with the CEMA Handbook mentioned above. The drive train of the salt storage dome-loading conveyor shall include a dry clutch to minimize current draw during starting.

The conveyor drive motor shall be TEFC and thermostat protected.

B.7 Electrical Work

Supply electric power to a point within 10 feet of the dome-loading conveyor where it enters the salt storage dome. Power supply shall be 440 volts, 3 phase 60 hertz. The power to the drive motor is designed upon a 40 Hp motor. The contractor is responsible for any changes required if a higher horsepower motor is furnished.

Furnish a pre-assembled control panel for the conveyor complete with starter, push buttons, switches and transformers. Supply the emergency stop buttons and limit switches required. Furnish hard wiring from the power supply to the control panel and from the control panel to the various motors and safety devices. Hard wiring shall conform to the local code requirement. Furnish all wiring and other electrical appurtenances in accordance to the manufacturer's recommendations.

B.8 Pit Excavation

Furnish Backfill Granular in accordance to the pertinent requirements of standard spec 209 for use as backfill material.

B.9 Geotechnical Report

A geotechnical report for the site has been prepared and is available from Jeff Bohen, PE at 141 NW Barstow Street, Waukesha, WI 53187, telephone (414) 750-2928.

The contractor shall be responsible for reproduction costs of any copies requested.

C Construction

C.1 General

Coordinate with the salt storage dome manufacturer and installer to ensure that the structural integrity of the dome is not compromised by the installation of the conveyor. Coordinate with the engineer in the field for the final dome loading belt conveyor orientation so as to achieve maximum salt dome storage capacity at least 15 working days prior beginning construction of the conveyor.

Transport and unload the conveyor system at the site. The contractor is responsible for the safe unloading and storage of the materials. Assemble and install the conveyor system at the site per the approved shop drawings. All related work must be done in accordance to manufacturer's drawings and specifications.

C.2 Pit and Below Grade Hopper

Excavate and backfill to proposed grade for the pit and below grade hopper. Compact backfill in accordance to standard spec 207.3.6.2.

Install all required footings, foundations, and/or other required substructures or supports at the required elevations on properly prepared subgrade.

C.3 Electrical Work

Perform all electrical work per applicable codes. The work shall be inspected and approved by the local building department. Install all wiring and electrical appurtenances in accordance to the manufacturer's recommendations.

C.4 Testing and Training

Testing for all materials shall be in accordance to the pertinent section of the standard specifications and performed by the contractor. Demonstrate that the conveyor system can operate at the specified duty and capacity.

Provide training and instructional manuals to the Milwaukee County Department of Public Works regarding proper operation and maintenance of the equipment. One training session is required at the site. The contact for Milwaukee County is Mr. Greg Heisel, (414) 257-6566. Contact Mr. Heisel 15 business days prior to scheduling the training.

Provide maintenance and service information for the principal components of the conveyor system to the Milwaukee County Department of Public Works.

D Measurement

The department will measure Conveyor as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0101	Conveyor	Each

Payment is full compensation for designing, fabricating, furnishing, erecting, and installing all materials including a 24-inch wide dome loading belt conveyor mounted to a salt storage dome, pit, below grade hopper and control gate system, steel grating, cleated loading belt, belt splice kit, reinforcing steel, frames, steel supports, walls, footings, skirt boards, conveyor covers, electric drive motor, drive components, dry clutch, idlers, pulleys, vibrator mounting plate, rotary vibrator, lubricants and grease, bolts, and accessories; for furnishing all required submittals and shop drawings; for providing all manuals; for coordinating with the salt storage dome manufacturer and installer; for transporting, unloading, and storing materials; for inspections with the local building department; for preparing the foundation; for furnishing and placing all concrete; for furnishing all excavating, bedding, backfilling, and compacting; for providing and installing all electrical components and appurtenances including control panel, starter, push buttons, switches, transformers, emergency stop buttons, limit switches, wiring, motors, safety devices and for making all connections; for furnishing all galvanizing or stainless steel; for providing all coatings and paint; for properly disposing of surplus materials; for testing all necessary items; for coordinating with Milwaukee County Department of Public works; for furnishing all training regarding the proper operation and maintenance of the equipment; for obtaining all necessary permits; for control of water.

62. Installing State Furnished Bike Rack, Item SPV.0060.0102.**A Description**

This special provision describes the installation of a department furnished bike rack as shown on the plans and as hereinafter provided.

B Materials

Use materials furnished by the department. Bike rack will be Saris Wave Rack, model #2160.

The department furnished material will be delivered to the site.

C Construction

Perform the work in accordance to the manufacturer's requirements.

D Measurement

The department will measure Installing State Furnished Bike Rack as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0102	Installing State Furnished Bike Rack	Each

Payment is full compensation for preparing and installing; for furnishing and installing all other items necessary to make the proposed system complete; and for clean-up and waste disposal.

63. Gabion Pillars, Item SPV.0060.7001.**A Description**

This special provision describes furnishing and installing Gabion Pillar as shown on the plans; excavating and backfilling in accordance to standard spec 206; proportioning, mixing, placing, and protecting concrete in accordance to standard spec 501; and as specified herein.

B Materials**B.1 Gabion Baskets**

Furnish assembled gabion baskets comprised of 3" x 3" 11 ga. galvanized wire woven mesh with galvanized spiral bind connectors. Baskets to be 3-feet wide, 1 ½-feet tall, and 6' long. Stacked baskets to be connected with spiral bound connectors.

B.2 Limestone Pieces

Furnish durable native Wisconsin flat limestone pieces that are sound, hard, dense, resistant to the action of air and water, and free of seams, cracks, or other structural defects. Use native Wisconsin flat limestone pieces 1 ½" to 2" in thickness, with a length and width ranging from 6" x 6" to 18" x 18". Waste concrete slabs cannot be substituted for stone. Stone to match limestone pieces in gabion baskets at the intersection of W. Watertown Plank Road and Discovery Parkway and should be white to light grey in color.

At least 15 working days prior to the start of placing limestone, supply five sample stones to be approved by the engineer. Do not place material without the engineer's approval of the stone quality, size, shape, and color.

C Construction

Install stacked gabion basket material in accordance to the manufacturer's recommendations where the plans show or as directed by the engineer. Fill baskets by hand stacking flat limestone pieces, interweaving throughout installation. Close baskets, stack next basket, and fill with limestone pieces. Close and connect baskets with spiral bind connectors per manufacturer's specifications.

D Measurement

The department will measure Gabion Pillar as each pillar, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.7001	Gabion Pillars	Each

Payment for Gabion Pillar is full compensation for furnishing and installing gabion baskets, connectors, limestone, concrete footings, and hardware; for filling and stacking gabion baskets; for providing sample limestone pieces; for disposing of surplus material; for furnishing all excavating, bedding, backfilling, and compacting.

64. Hydrant Assembly, Item SPV.0060.7101.**A Description**

This work includes providing and installing new hydrants at locations indicated in the plans, conforming to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and as hereinafter provided.

B Materials**B.1 New Hydrant Assembly**

Provide new water main hydrants, valve and valve box, and hydrant lead piping meeting the requirements of the City of Wauwatosa.

Hydrant shall be a AWWA C502 hydrant with all operating nuts and hose connections meeting City of Wauwatosa size requirements.

B.2 Resilient Wedge Gate Valves and Box

City of Wauwatosa standard conforming to AWWA C509, 200 psi working pressure; non-rising bronze stem; valve opens clockwise.

Internal parts accessible without removing main body from pressure line.

Internal diameter of valve shall be equal to or greater than connection pipe diameter.

Furnish with mechanical joint ends and 2-inch operating nut. Use corrosion resistant steel nuts and bolts, NSS Technologies, Inc., Cor-Blue or an approved equal.

Valve Box Adapter; furnish epoxy-coated, 1/4-inch steel, rubber gasket and size to fit valve. Similar and equal to adaptors manufactured by Adaptor, Inc., West Allis, WI.

B.3 Hydrant Lead Piping

Ductile iron (DI) restrained joint piping shall be in accordance to AWWA C151, Class 55. Design pipe with fittings conforming to AWWA C110.

Cast in or stamp on pipe manufacturer's mark, year of production, and "DI" or "DUCTILE."

Pipe shall be cement mortar lined and have internal and external bituminous coats designed for restrained joints conforming to AWWA C110.

Cast in or stamp on pipe manufacturer's mark, year of production, and "DI" or "DUCTILE."

B.4 Fittings

Fittings shall conform to AWWA C110, centrifugally cast in metal or sand-lined molds.

Use of compact fittings conforming to AWWA C153 is acceptable. In no case shall fitting grade rating less than adjoining pipe.

Fittings shall be from same manufacturer as pipe.

Join lead pipe and fittings by means of restrained joints conforming to AWWA C110.

Nuts and bolts for joints and fittings shall be corrosion resistant steel, NSS Technologies, Inc., Cor-Blue or approved equal.

B.5 Polyethylene Sheeting for Pipe Corrosion Protection

Polyethylene sheeting conforming to ASTM D4976, Type I, Class B, color black, Grade E-1, 1200 psi tensile strength, minimum thickness of 8 mil. Tube diameter or sheet width shall conform to AWWA C105.

Provide tape for polyethylene sheeting that is 2-inch wide, black tape with rubber adhesive and minimum 9 mil polyethylene backing. Tape shall be 3M™ Preservation Sealing Tape 481 or an approved equal.

C Construction

C.1 General

In accordance to Wisconsin Statute 182.0175, "Damage to Transmission Facilities," Excavator, as defined in 182.0175(1)(bm), shall be solely responsible to provide advance notice to "Diggers Hotline, Inc." (800) 242-8511 not less than three working days prior to commencement of any Excavation, as defined in the statute, required to perform work contained in this Project, and further, Excavator shall comply with all other requirements of this Statute relative to Excavation.

Before beginning excavation of trench, contractor shall uncover existing water main to which new hydrant tee and lead piping is to connect to verify line, grade and connection required.

C.2 Installation of Hydrant Assembly

Provide hydrants, hydrant lead, valves, fittings, and branch T-connectors with independent support of minimum 16-Inch x 8-Inch x 4-Inch solid block or 3000 psi formed concrete pad.

Place crushed clear stone below base of hydrant to 6 inches above drain holes in hydrant stem.

Set hydrant plumb and centerline of hydrant vertical. Solidly buttress hydrant against trench wall.

Locate hydrant at municipal standard distance behind face of curb and set lowest hose connection at utility standard dimension above proposed finished grade.

Set valve on solid masonry concrete blocking (16-Inch x 8-Inch x 4-Inch) with long dimension of block perpendicular to water main and level.

Set valve box on valve box adaptor. Verify centered location and check installation by applying key over valve nut to verify access and operation.

Extend valve box to subgrade and place a sheet of polyethylene over shaft prior to inserting cover to seal box.

Adjustment of valve box to temporary and finished grades will be responsibility of grading or paving contractor.

Coat internal cast iron surfaces with two coats of corrosion resistant coating

D Measurement

The department will measure Hydrant Assembly by each individual hydrant assembly, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.7101	Hydrant Assembly	Each

Payment is full compensation for furnishing and installing all materials; for excavating, backfilling, and compacting; for control of water; for water main inspection.

65. Butterfly Valve, 12-Inch, Item SPV.0060.7102.

A Description

This work includes providing and installing butterfly valves at locations indicated in the plans, conforming to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and as hereinafter provided.

B Materials

B.1 Butterfly Valves

City of Wauwatosa standard conforming to AWWA C504, 150 psi working pressure; non-rising bronze stem; valve opens clockwise.

Internal parts accessible without removing main body from pressure line.

Internal diameter of valve shall be equal to or greater than connection pipe diameter.

Furnish with mechanical joint ends and 2-inch operating nut. Use corrosion resistant steel nuts and bolts, NSS Technologies, Inc., Cor-Blue or an approved equal.

B.2 Valve Box Adaptor

Furnish epoxy-coated, 1/4-inch steel, rubber gasket and size to fit valve. Similar and equal to adaptors manufactured by Adaptor, Inc., West Allis, WI.

B.3 Polyethylene Sheeting for Pipe Corrosion Protection

Polyethylene sheeting conforming to ASTM D4976, Type I, Class B, Color: Black, Grade E-1, 1200 psi tensile strength, minimum thickness of 8 mil. Tube diameter or sheet width shall conform to AWWA C105.

Furnish tape for polyethylene sheeting that is 2-inch wide, black tape with rubber adhesive and minimum 9 mil polyethylene backing. Tape shall be 3M™ Preservation Sealing Tape 481 or an approved equal.

C Construction

C.1 General

Install valve in closed position and in accordance to manufacturer's instructions.

Set valve on solid masonry concrete blocking (16-Inch x 8-Inch x 4-Inch) with long dimension of block perpendicular to water main and level.

Extend bedding and compact up to elevation required to set valve box adaptor over valve.

Set valve box on valve box adaptor. Verify centered location and check installation by applying key over valve nut to verify access and operation.

Place additional bedding material to a minimum depth of 6 inches around valve box and compact to prevent box or adaptor from shifting.

Extend valve box to subgrade and place a sheet of polyethylene over shaft prior to inserting cover to seal box.

Adjustment of valve box to temporary and finished grades will be responsibility of grading or paving contractor.

Coat internal cast iron surfaces with two coats of corrosion resistant coating.

D Measurement

The department will measure Butterfly Valve, 12-Inch by each valve, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.7102	Butterfly Valve, 12-Inch	Each

Payment is full compensation for furnishing and installing all materials; excavating, backfilling, and compacting.

66. Resilient Wedge Gate Valve, 8-Inch, Item SPV.0060.7103; Resilient Wedge Gate Valve, 6-Inch, Item SPV.0060.7104.

A Description

This work includes providing and installing resilient wedge gate valves at locations indicated in the plans, conforming to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and as hereinafter provided.

B Materials

B.1 Resilient Wedge Gate Valves

City of Wauwatosa standard conforming to AWWA C509, 200 psi working pressure; non-rising bronze stem; valve opens counter-clockwise.

Internal parts accessible without removing main body from pressure line.

Internal diameter of valve shall be equal to or greater than connection pipe diameter.

Furnish with mechanical joint ends and 2-inch operating nut. Use corrosion resistant steel nuts and bolts, NSS Technologies, Inc. Cor-Blue or an approved equal.

B.2 Valve Box Adaptor

Furnish epoxy-coated, 1/4-inch steel, rubber gasket and size to fit valve. Similar and equal to adaptors manufactured by Adaptor, Inc., West Allis, WI.

B.3 Polyethylene Sheeting for Pipe Corrosion Protection

Polyethylene sheeting conforming to ASTM D4976, Type I, Class B, Color: Black, Grade E-1, 1200 psi tensile strength, minimum thickness of 8 mil. Tube diameter or sheet width shall conform to AWWA C105.

Furnish tape for polyethylene sheeting that is 2-inch wide, black tape with rubber adhesive and minimum 9 mil polyethylene backing. Tape shall be 3M™ Preservation Sealing Tape 481 or an approved equal.

C Construction

C.1 General

Install valve in closed position and in accordance to manufacturer's instructions.

Set valve on solid masonry concrete blocking (16-Inch x 8-Inch x 4-Inch) with long dimension of block perpendicular to water main and level.

Extend bedding and compact up to elevation required to set valve box adaptor over valve.

Set valve box on valve box adaptor. Verify centered location and check installation by applying key over valve nut to verify access and operation.

Place additional bedding material to a minimum depth of 6 inches around valve box and compact to prevent box or adaptor from shifting.

Extend valve box to subgrade and place a sheet of polyethylene over shaft prior to inserting cover to seal box.

Adjustment of valve box to temporary and finished grades will be responsibility of grading or paving contractor.

Coat internal cast iron surfaces with two coats of corrosion resistant coating.

D Measurement

The department will measure Resilient Wedge Gate Valve, 8-inch and Resilient Wedge Gate Valve, 6-inch by each valve provided and installed, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.7103	Resilient Wedge Gate Valve, 8-inch	Each
SPV.0060.7104	Resilient Wedge Gate Valve, 6-inch	Each

Payment is full compensation for furnishing all materials; excavating, backfilling, and compacting.

67. Cut and Cap Water Main, Item SPV.0060.7105.

A Description

This special provision describes cutting and capping existing water main, in accordance to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest Edition.

B (Vacant)

C Construction

Backfill materials shall meet City of Wauwatosa Standards and be approved by the City of Wauwatosa.

D Measurement

The department will measure Cut and Cap Water Main as each individual cut and cap, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.7105	Cut and Cap Water Main	Each

Payment is full compensation for providing all materials; for furnishing all excavation; for providing Backfill material.

68. Removing Hydrant, Item SPV.0060.7106.

A Description

Removing existing hydrant and hydrant leads in accordance to the requirements of the plans and the Standard Specifications for Sewer and Water Construction in Wisconsin and as hereinafter provided

B (Vacant)

C Construction

Unless shown otherwise, backfill all water main excavations with granular backfill

Backfill materials shall meet City of Wauwatosa Standards and be approved by the City of Wauwatosa.

D Measurement

The department will measure Removing Hydrant as each individual hydrant, acceptably removed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.7106	Removing Hydrant	Each

Payment is full compensation for providing all materials; for furnishing all excavating, for sheeting and shoring; for concrete base, buttresses, and anchors; for bulkheading and abandoning existing water mains; for providing granular backfill material, for backfilling;

for removing sheeting and shoring; for cleaning out the site of the work and incidentals necessary to complete the work.

69. Hydrant Assembly Relocation, Item SPV.0060.7107.

A Description

This work includes relocating existing hydrants or installing new hydrants at locations indicated in the plans, conforming to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and as hereinafter provided. Reference plan notes for hydrant relocation specific requirements.

B Materials

B.1 General

Salvage existing hydrant for reinstallation or provide new hydrant.

Provide caps for capping and sealing existing tee, salvage and re-install designated hydrant and lead piping and provide a new tee for cut-in water main connection, valve, valve adaptor and valve box meeting the requirements of the City of Wauwatosa.

B.2 Fittings

Fittings shall conform to AWWA C110, centrifugally cast in metal or sand-lined molds.

Use of compact fittings conforming to AWWA C153 is acceptable.

In no case shall fitting grade rating less than adjoining pipe.

Fittings shall be from same manufacturer as pipe.

Nuts and bolts for joints and fittings shall be corrosion resistant steel, NSS Technologies, Inc. Cor-Blue or approved equal.

B.3 Valve Box Adaptor

Furnish epoxy-coated, 1/4-inch steel, rubber gasket and size to fit valve. Similar and equal to adaptors manufactured by Adaptor, Inc., West Allis, WI.

B.4 Valve Box

Furnish cast iron, 5-1/4 inch diameter (minimum) shaft; round base; 5-1/4 inch drop lid marked "WATER"; length of assembly sized to span top of main to finished grade with a minimum remaining adjustment of an additional 3 inches.

B.5 Polyethylene Sheeting for Pipe Corrosion Protection

Furnish polyethylene sheeting conforming to ASTM D4976, Type I, Class B, color black, Grade E-1, 1200 psi tensile strength, minimum thickness of 8 mil. Tube diameter or sheet width shall conform to AWWA C105.

Furnish tape for polyethylene sheeting that is 2-inch wide, black tape with rubber adhesive and minimum 9 mil polyethylene backing. Tape shall be 3M™ Preservation Sealing Tape 481 or an approved equal.

C Construction

C.1 General

In accordance to Wisconsin Statute 182.0175, "Damage to Transmission Facilities," Excavator, as defined in 182.0175(1)(bm), shall be solely responsible to provide advance notice to "Diggers Hotline, Inc.", (800) 242-8511, not less than three working days prior to commencement of any Excavation, as defined in the statute, required to perform work contained in this Project, and further, Excavator shall comply with all other requirements of this Statute relative to Excavation.

Before beginning excavation of trench, contractor shall uncover existing hydrant tee connection and cap after removing hydrant lead pipe and hydrant for re-location. Contractor shall then uncover water main to which re-located hydrant is to be re-located. Provide new hydrant tee and connect to salvaged lead piping and verify line, grade and connection required. Clean all salvaged products to ensure required installation requirements are achieved.

C.2 Installation of Hydrant Assembly

Provide salvaged hydrant and hydrant lead, new valves, fittings, and branch T-connectors with independent support of minimum 16-Inch x 8-Inch x 4-Inch solid block or 3000 psi formed concrete pad.

Place crushed clear stone below base of re-located hydrant to 6 inches above drain holes in hydrant stem.

Set re-located hydrant plumb and centerline of hydrant vertical.

Solidly buttress re-located hydrant against trench wall.

Join pipe and fittings by means of a rubber gasket push-on joints conforming to AWWA C111.

Locate re-located hydrant at City of Wauwatosa standard distance behind face of curb and set lowest hose connection at utility standard dimension above proposed finished grade.

D Measurement

The department will measure Hydrant Assembly Relocation by each hydrant assembly provided and installed, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.7107	Hydrant Assembly Relocation	Each

Payment is full compensation for furnishing and installing all materials; excavating, backfilling, and compacting.

70. Air Release Valve 2-Inch, Item SPV.0060.7108.

A Description

This work shall consist of an air release valve and accessories as shown on the plans and as herein provided.

B Materials

2-Inch Air valve rated for 150 psi working pressure

2-Inch inlet plug valve, 150 psi rated.

Air release valves shall consist of a single or dual housing. The body and cover shall be of gray cast iron in accordance to ASTM A126, Class B or ductile iron in accordance to ASTM A536, Grade 65-45-12.

The valve trim, float, and all working parts shall be constructed of stainless steel, brass, or other corrosion resistant material.

C Construction

Valves shall be installed as indicated on the plans.

D Measurement

The department will measure Air Release Valve 2-Inch as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.7108	Air Release Valve 2-Inch	Each

Payment is full compensation for excavating, backfilling, dewatering, sheeting, shoring, furnishing and installing all materials for the complete valve and housing installation.

71. Abandon Valve Boxes, Item SPV.0060.7109.

A Description

The contractor shall abandon all water valve boxes which serve valves no longer in service, where indicated by the plans or designated by the engineer.

B (Vacant)

C Construction

The contractor shall remove the entire valve box including the base section for all valve boxes. The contractor shall backfill all openings with granular backfill.

D Measurement

The department will measure Abandon Valve Boxes by each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.7109	Abandon Valve Boxes	Each

Payment is full compensation for excavating, backfilling, dewatering, sheeting, shoring, furnishing and all materials for the valve abandonment.

72. Adjusting Valve Boxes, Item SPV.0060.7110.**A Description**

This special provision describes adjusting, protecting, and maintaining accessibility, for the duration of the project, to all city water service boxes and water valve boxes located within the project limits.

B Materials

All material for the adjustment of these facilities must meet City of Wauwatosa specifications.

C Construction

All water service boxes and water valve boxes within the project limits shall be adjusted to proposed elevations by the contractor using materials meeting city specifications.

Throughout the duration of the project, the contractor must ensure that all water service boxes and water valve boxes are adequately located and identified by blue paint, and that at all times, all water appurtenances remain accessible for operation by city forces. Exercise caution working adjacent to water facilities to avoid damage and ensure accessibility.

Upon completion of the contract, the city will inspect all water facilities to ensure the water boxes and manholes are clean, properly aligned, and accessible. The contractor shall be responsible to make identified repairs and adjustments, and if any repairs or adjustments are made by the city, the cost will be charged to the contractor.

D Measurement

The department will measure Adjusting Valve Boxes as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.7110	Adjusting Valve Boxes	Each

Payment is full compensation for furnishing all excavation, backfilling, disposal of surplus materials, water box clean-out, and restoration of the work site.

73. Adjusting Hydrant, Item SPV.0060.7111.**A Description**

This work includes removing, extending or cutting hydrant standpipe, and re-installing water hydrants, in accordance to the State Standard Specifications, as shown on the plans, and as hereinafter specified in Wisconsin, latest edition and as hereinafter provided.

B Materials

Existing hydrants, fittings, and tracer wire access boxes, are to be reused.

Hydrant Extensions

Fabricate in multiples of 6 inches with rod and coupling to increase barrel length. Maximum of one extension per hydrant may be used. If additional extension is necessary on hydrant with existing extension, remove existing extension and replace with single, adequate extension.

Hydrant Barrel Piping

Barrel pipe and sleeves shall be ductile iron, Class 55, conforming to AWWA C150. Encase sleeves in Polyethylene sheeting conforming to ASTM D4976, Type I, Class B, color black, Grade E-1, 1200 psi tensile strength, minimum thickness of 8 mil. Tube diameter or sheet width shall conform to AWWA C105.

Pipe shall have restrained rubber gasket push-on joints. Restraints shall be ASTM A536 ductile iron, circular or pair of semi-circles with wedges that grip ductile iron.

C Construction**Remove Hydrant and Barrel Pipe**

If lumped subsoil or rock is encountered, remove to provide a clearance of at least 6 inches below and on each side of pipe, valves and fittings.

Extend Barrel Piping: Determine length of barrel piping needed from existing end to new hydrant elevation, cut pipe accordingly and connect with sleeve.

Shorten Barrel Piping: Determine length of barrel piping needed from existing end to new hydrant elevation and cut existing barrel pipe accordingly.

Lift barrel piping and hydrants carefully from trench with hydrant valve closed, disconnect and remove existing hydrant.

Secure pipe in place with bedding material, placed by hand or equally careful means, keeping end open. Remove pipe and fittings that do not allow sufficient and uniform space for joints and replace with pipe and fittings of proper dimensions to ensure such uniform space.

Keep interior and exterior of pipe clean and free from foreign material before installation. Provide necessary means to wipe, brush, swab or air blast to remove any foreign material from interior of pipe as instructed by pipe manufacturer.

Hydrant Reinstallation

Place crushed clear stone below base of hydrant to 6 inches above drain holes in hydrant stem.

Set hydrant plumb and centerline of hydrant vertical as blocked to firm trench wall.

Set lowest hose connection above proposed finished grade by 18 to 24 inches.

D Measurement

The department will measure Adjusting Hydrant of a given height as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.7111	Adjusting Hydrant	Each

Payment is full compensation for furnishing all materials; cutting, excavating, backfilling, and compacting; for removing and reinstalling.

74. Removing Water Valve, Item SPV.0060.7112.

A Description

Work shall consist of removing water valve where indicated on the plans in accordance to section 204.1 for Sewer and Water Construction in Wisconsin, latest edition and amendments, ("SWS") and as hereinafter provided.

B Materials

Granular backfill shall conform to standard spec 209.

Concrete for plugs on dead water mains to be abandoned shall be Grade B conforming to standard spec 501.

Use Ductile Iron Caps and Plugs conforming to AWWA C153/C111 for live water mains.

C Construction

Remove water valve in accordance to standard spec 204.3.

Conform to the pertinent requirements of Part IV, Chapter 4.14.0 of the “Sewer/Water Specifications” for removing water valves.

Where valve is located on water main to be abandoned, drain and bulkhead open ends of water main with concrete bulkheads. Where the water main will remain in service, plug ends of water with MJ restrained plug or cap.

Backfill excavation with granular material conforming to standard spec 209.

D Measurement

The department will measure Removing Water Valve as each individual removed unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.7112	Removing Water Valve	Each

Payment is full compensation for excavating, backfilling and compaction, cutting water main, draining and dewatering, removing valve from water main, concrete bulkheads, plugs, mechanical restraint, sheathing, shoring, and bracing; for control of water; for water main inspection; for removing and disposing of materials; and for site cleanup.

75. No Mow Fescue Grass Seed, Item SPV.0085.7001.**A Description**

This special provision describes supplying and installing “No Mow” fescue grass seed as shown on the site landscape plans.

B Materials

Furnish a “No Mow” fescue grass mix from the following suppliers or equivalent:

No Mow Lawn Mix with Annual Rye
Prairie Nursery, Inc.
W5875 Dyke Avenue
Westfield, WI 53964
(608) 296-3679

Eco-Lawn
Wildflower Farm
10195 Hwy 12 West, R.R. #2
Coldwater, ON L0K 1E0
(866) 476-9453

Care-Free Fine Fescue Mix
Old's Seed Solutions
2901 Packers Ave.
Madison, WI 53707
(608) 249-0695

C Construction

Install seed as per State of Wisconsin Standard Specifications for Highway and Structure Construction, latest edition and per manufacturers recommended seeding rate, typically 5-6 lbs per 1,000 sq ft.

D Measurement

The department will measure No Mow Fescue Grass Seed by the pound, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0085.7001	No Mow Fescue Grass Seed	LB

Payment for No Mow Fescue Grass Seed is full compensation for providing and installing No Mow Fescue Grass Seed.

76. Concrete Curb and Gutter 6-Inch Sloped 31-Inch, Item SPV.0090.0001.

A Description

Perform this work in accordance to the pertinent requirements of standard spec 601 and conform to the construction detail shown in the plans.

B Materials

Use materials as described in the construction detail shown in the plans and as described in standard spec 601.2.

C Construction

Perform work in accordance to standard spec 601.3.

D Measurement

The department will measure Concrete Curb and Gutter 6-Inch Sloped 31-Inch by the linear foot, acceptably completed, measured along the flow line of the gutter.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0001	Concrete Curb and Gutter 6-Inch Sloped 31-Inch	LF

Payment is full compensation for preparing the foundation; all special construction required at driveway entrances or curb ramps; for providing all materials, including concrete, expansion joints, and tie bars in unhardened concrete; for placing, finishing, protecting, and curing concrete; and for sawing joints.

77. Removing Sanitary Sewer, Item SPV.0090.0002.**A Description**

This special provision describes completely removing existing sanitary sewer pipe and disposing of all resulting materials in accordance to the plans, Standard Specifications for Highway and Structure Construction, latest edition and amendments, Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the “Special Provision Notes for Sanitary Sewer Work” as found in the plans, and as hereinafter provided and these special provisions.

B Materials

Granular backfill as required in Chapter 2.6.2 of the SSSW, shall conform to the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

C Construction

Remove the sanitary sewer pipe in its entirety. Perform work in accordance to the pertinent specifications of standard spec 204. The contractor is responsible for the safe methods and sequence of controlled removal operations. Completely remove the existing utility to the extent required to avoid interfering with new construction work as shown on plans and as directed by the engineer.

The cutting and removal of existing sanitary sewer pipe from within the trench of replacement sanitary sewer will not be paid for separately, but shall be considered incidental to the respective sanitary sewer item.

Thoroughly clean the ends of the existing pipe to remain and abandon in accordance to Section 3.2.24 of the SSSW.

Provide granular backfill as required in Chapter 2.6.2 of the SSSW, meeting the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

Consolidate all backfill by mechanical compaction per specification 2.6.14(b) of the SSSW. Special compaction equipment and measures are required where standard compaction equipment cannot be utilized. Flooding of backfill will not be allowed.

Compaction shall achieve uniform consolidation in conformance with section 2.6.14(b) of the SSSW.

Provide by-pass pumping of wastewater round construction zone during working hours. During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

D Measurement

The department will measure Removing Sanitary Sewer by the linear foot, acceptably completed, measured horizontally to the nearest foot from face to face of bulkheads along the centerline of the pipe.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0002	Removing Sanitary Sewer	LF

Payment is full compensation for providing all excavating; furnishing and installing all materials; for cutting and removing existing sanitary sewer pipe; for abandoning unused sewers; for furnishing and placing granular backfill; for hauling and disposing of all materials.

78. Storm Sewer Pipe Corrugated High Density Polyethylene (HDPE) 12-Inch, Item SPV.0090.0009.

A Description

This special provision describes furnishing and installing storm sewer in accordance to standard spec 607 and standard spec 608, as shown on the plans, and as hereinafter provided.

B Materials

Supplement standard spec 607.2 and standard spec 608.2 as follows:

Corrugated HDPE pipe and fittings shall conform to the requirements of the Specifications for Corrugated Polyethylene Pipe, 12 to 36 inch Diameter, AASHTO Designation: M 294, Type S; and the Specifications for Corrugated Polyethylene Drainage Tubing, AASHTO Designation: M 252-92, Type S, for 8 and 10 inch diameter pipe. Joint connections shall include gaskets as recommended by the manufacturer.

C Construction

Supplement standard spec 607.3 as follows:

Trench width shall be in accordance to Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe, ASTM Designation D2321. Minimum trench width

shall be not less than the greater of either the pipe outside diameter plus 16 inches or the pipe outside diameter times 1.25 plus 12 inches.

Joints for sewer pipe shall be sealed to be soil tight in accordance to AASHTO Standard Specifications for Highway Bridges, section 26.4.2.4(e).

Pipes of diameter 12 inches and larger shall be tested for acceptance with an approved go/no-go mandrel. The mandrel tests shall be conducted following installation of the pipe and between five and ten days prior to pavement surfacing or completion of the final grade.

At least ten percent of the installed length of pipe selected by the engineer shall be inspected for deformations using a nine-point mandrel. The mandrel shall have a diameter equal to 95 percent of the nominal diameter of the pipe. If the mandrel tests indicate excessive deflection in the selected length of pipe, the engineer may require additional lengths of pipe be tested in increments of ten percent of the total installed length. For acceptance, the mandrel must pass through the entire section between manholes or other structures in one pass when pulled by hand without the use of excessive force.

Furnish the mandrel, all materials, equipment and labor for making this acceptance test. The mandrel shall be of a shape similar to that of a true circle enabling the gauge to pass through a satisfactory pipeline with little or no resistance. The mandrel shall be of a design to prevent it from tipping from side to side and to prevent debris build-up from occurring between the channels of the adjacent fins or legs during operation. Each end of the core of the mandrel shall have fasteners to which the pulling cables can be attached. The mandrel shall have nine various sized fins or legs of appropriate dimensions for various diameter pipes. Each fin or leg shall have a permanent marking that states its designated pipe size and percent deflection allowable.

If undamaged, remove and relay pipe with reduced diameter of more than 5 percent or replace with a new pipe at no cost to the department. Relayed pipe and new pipe shall be retested with the mandrel at no cost to the department.

Supplement standard spec 607.3.5 as follows:

Backfill immediately all trenches and excavations after the sewers have been constructed therein. Use backfill that meets the requirements for Granular Backfill in standard spec 209, except that all such material placed around the pipe and to 6 inches, above the pipe shall pass a 1-inch sieve.

D Measurement

The department will measure Storm Sewer Pipe Corrugated High Density Polyethylene (HDPE) 12-Inch in length by the linear foot, in accordance to standard spec 607.4.1.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0009	Storm Sewer Pipe Corrugated High Density Polyethylene (HDPE) 12-Inch	LF

Payment is full compensation for performing the work as described in standard spec 607.5.1; furnishing, operating, and maintaining a mandrel; performing the mandrel testing; and performing all necessary corrective actions and corrective work associated with the mandrel testing, if mandrel testing is required.

79. Storm Sewer PVC SDR 35 6-Inch, Item SPV.0090.0011; Storm Sewer PVC SDR 35 8-Inch, Item SPV.0090.0012; Storm Sewer PVC SDR 35 10-Inch, Item SPV.0090.0013.

A Description

This special provision describes furnishing and installing storm sewer in accordance to standard spec 607 and standard spec 608, as shown on the plans, and as hereinafter provided.

B Materials

Supplement standard spec 607.2 and standard spec 608.2 as follows:

The pipe shall be polyvinylchloride Pipe (PVC), ASTM D-3034 SDR-35. All fittings, including bends, shall be of the same material. Material joining the fitting to the pipe shall be free from cracks and shall adhere tightly to each joining surface.

C Construction

Supplement standard spec 607.3 for PVC SDR 35 pipe as follows:

Trench width shall be in accordance to Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe, ASTM Designation D2321. Minimum trench width shall be not less than the greater of either the pipe outside diameter plus 16 inches or the pipe outside diameter times 1.25 plus 12 inches.

Joints for sewer pipe shall be sealed to be soil tight in accordance to AASHTO Standard Specifications for Highway Bridges, section 26.4.2.4(e).

Pipes of diameter 12 inches and larger shall be tested for acceptance with an approved go/no-go mandrel. The mandrel tests shall be conducted following installation of the pipe and between five and ten days prior to pavement surfacing or completion of the final grade.

At least ten percent of the installed length of pipe selected by the engineer shall be inspected for deformations using a nine-point mandrel. The mandrel shall have a diameter equal to 95 percent of the nominal diameter of the pipe. If the mandrel tests indicate excessive deflection in the selected length of pipe, the engineer may require additional lengths of pipe be tested in increments of ten percent of the total installed length. For acceptance, the mandrel must pass through the entire section between manholes or other structures in one pass when pulled by hand without the use of excessive force.

Furnish the mandrel, all materials, equipment and labor for making this acceptance test. The mandrel shall be of a shape similar to that of a true circle enabling the gauge to pass through a satisfactory pipeline with little or no resistance. The mandrel shall be of a design to prevent it from tipping from side to side and to prevent debris build-up from occurring between the channels of the adjacent fins or legs during operation. Each end of the core of the mandrel shall have fasteners to which the pulling cables can be attached. The mandrel shall have nine various sized fins or legs of appropriate dimensions for various diameter pipes. Each fin or leg shall have a permanent marking that states its designated pipe size and percent deflection allowable.

If undamaged, remove and relay pipe with reduced diameter of more than 5 percent or replace with a new pipe at no cost to the department. Relayed pipe and new pipe shall be retested with the mandrel at no cost to the department.

D Measurement

The department will measure Storm Sewer PVC SDR 35 Pipe (Size) in length by the linear foot, in accordance to standard spec 607.4.1.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0011	Storm Sewer PVC SDR 35 Pipe 6-Inch	LF
SPV.0090.0012	Storm Sewer PVC SDR 35 Pipe 8-Inch	LF
SPV.0090.0013	Storm Sewer PVC SDR 35 Pipe 10-Inch	LF

Payment is full compensation for performing the work as described in standard spec 607.5.1; furnishing, operating, and maintaining a mandrel; performing the mandrel testing; and performing all necessary corrective actions and corrective work associated with the mandrel testing, if mandrel testing is required.

80. Electrical Wire Lighting 500 KCMIL, Item SPV.0090.1035.

A Description

The work under this item shall consist of furnishing and installing electrical wire sized 500 kcmil.

B Materials

Wire shall be in conformance with the latest edition of the State of Wisconsin Standard Specifications for Highway and Structure Construction, standard spec 655 Electrical Wiring with the exception that THWN-2, XHHW-2 and USE-2 type of insulation is allowed.

C (Vacant)**D Measurement**

The department will measure Electrical Wire Lighting 500 KCMIL as each linear foot, acceptably completed, measured separately for each conductor.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.1035	Electrical Wire Lighting 500 KCMIL	LF

Payment is full compensation for furnishing and installing the electrical wire; making final connections and testing.

81. Poly Edging Material, Item SPV.0090.7001.**A Description**

This special provision describes furnishing and installing poly edging material to separate planting areas from turf areas.

B Materials

Furnish 5-inch to 5 1/4-inch tall medium density polyethylene edging with UV inhibitor, black in color, with pins/stakes as necessary to stabilize edging.

C Construction

Install poly edging material where the plans show or where the engineer directs. Install poly edging material so top of edging is 1-inch above top of mulch height. Install poly edging material with pins/stakes as necessary to anchor and stabilize edging.

D Measurement

The department will measure Poly Edging Material by the linear foot, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.7001	Poly Edging Material	LF

Payment for steel edging material is full compensation for furnishing and installing steel edging material and pins/stakes.

82. Decorative Steel Fence, Item SPV.0090.7002.

A Description

This special provision describes furnishing and installing Decorative Steel Fence as shown on the plans; excavating and backfilling in accordance to standard spec 206; proportioning, mixing, placing, and protecting concrete in accordance to standard spec 501; and as specified herein.

B Materials

Furnish 58" to 60" tall commercial grade decorative steel fence material, black in color, with 2 1/2" square 16 ga. posts, 3/4" wide 18 ga. pickets, three 1 1/2" rails, all mounting hardware, and accessories.

C Construction

Install Decorative Steel Fence in accordance to the manufacturer's recommendations where the plans show or as directed by the engineer.

D Measurement

The department will measure Decorative Steel Fence by the linear foot, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.7002	Decorative Steel Fence	LF

Payment for Decorative Steel Fence is full compensation for furnishing and installing fence, posts, pickets, rails, concrete footings, mounting hardware, and accessories; for furnishing all painting; for furnishing all excavating, bedding, backfilling, and compacting.

83. Green Screen Fence, Item SPV.0090.7003.

A Description

This special provision describes furnishing and installing Green Screen Fence as shown on the plans; excavating and backfilling in accordance to standard spec 206; proportioning, mixing, placing, and protecting concrete in accordance to standard spec 501; and as specified herein.

B Materials

Furnish 72" tall (Two 36-inch Panels) Green Screen freestanding fence material, straight and curved, matte black in color, including all posts, hardware, and accessories from the following supplier:

Green Screen Fence
Green Screen
1743 S. La Cienega Blvd
Los Angeles, CA 90035-4650
(310) 837-0526

C Construction

Install Green Screen Fence in accordance to the manufacturer's recommendations where the plans show or as directed by the engineer.

Install vine plantings adjacent to Green Screen Fence after the fencing and restoration work has been completed. Vine plantings will be paid for under separate bid items.

D Measurement

The department will measure Green Screen Fence by the linear foot, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.7003	Green Screen Fence	LF

Payment for Green Screen Fence is full compensation for furnishing and installing fence, panels, posts, tubes, caps, trim, snap clips, concrete footings, mounting hardware, and accessories; for furnishing all painting; for furnishing all excavating, bedding, backfilling, and compacting.

84. Ductile Iron (DI), Class 55 Water Main, 12-Inch, Item SPV.0090.7101; Ductile Iron (DI), Class 55 Water Main, 8-Inch, Item SPV.0090.7102.

A Description

This work includes providing and installing ductile iron water main at locations indicated in the plans, conforming to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and as hereinafter provided.

B Materials

B.1 General

Furnish all fittings (restrained joint and standard) required for installation on this project.

Unless specified otherwise, water main shall be Push-on Rubber Gasket Joint Ductile Iron conforming to AWWA C150, Class 55. Design pipe joint ends for rubber push-on gasket joints, conforming to AWWA C111. Water main specified as restrained joint, shall be Restrained Joint Ductile Iron Thickness Class 55 pipe, conforming to AWWA C-151 with fittings conforming to AWWA C110.

Cast in or stamp on pipe manufacturer's mark, year of production, and "DI" or "DUCTILE."

Pipe shall be cement mortar lined and have internal and external bituminous coats.

B.2 Fittings

Fittings shall conform to AWWA C110 and AWWA C111, centrifugally cast in metal or sand-lined molds. Use of compact fittings conforming to AWWA C153 is acceptable. In no case shall fitting grade rating be less than adjoining pipe. Fittings shall be from same manufacturer as pipe.

Nuts and bolts for joints and fittings shall be corrosion resistant steel, NSS Technologies, Inc., Cor-Blue or approved equal.

B.3 Polyethylene Sheeting for Pipe Corrosion Protection

Polyethylene sheeting conforming to ASTM D4976, Type I, Class B, color black, Grade E-1, 1200 psi tensile strength, minimum thickness of 8 mil. Tube diameter or sheet width shall conform to AWWA C105.

Furnish tape for polyethylene sheeting that is 2-inch wide, black tape with rubber adhesive and minimum 9 mil polyethylene backing. Tape shall be 3M™ Preservation Sealing Tape 481 or an approved equal.

B.4 Trench Insulation

Extruded polystyrene board conforming to ASTM C578, Type V, rigid, closed cell type, with integral high density skin, Dow Chemical Company STYROFOAM™ Highload 100 or an approved equal.

Thermal Resistance: Typical 5 year aged value of R-5 per inch of thickness per ASTM C518.

Board Size: 24 x 96 x 2-inch thick. Square edges. Compressive Strength: Minimum 100 psi per ASTM D1621.

Water Absorption: 0.7 percent by volume maximum per ASTM D2842.

All bedding, cover and backfill materials shall meet City of Wauwatosa Standards and be approved by the City of Wauwatosa.

C Construction

C.1 General

In accordance to Wisconsin Statute 182.0175, "Damage to Transmission Facilities," Excavator, as defined in 182.0175(1)(bm), shall be solely responsible to provide advance notice to "Diggers Hotline, Inc." (800) 242-8511 not less than three working days prior to commencement of any Excavation, as defined in the statute, required to perform work

contained in this project, and further, excavator shall comply with all other requirements of this statute relative to Excavation.

Before beginning excavation of trench, contractor shall uncover stub end of existing water main to which relay is to connect, to permit adjustments in line and grade and verify connection required.

C.2 Installation of Ductile Iron Pipe

Unless specified otherwise join pipe and fittings by means of a compression type rubber gasket push-on joints conforming with AWWA C111.

Excavation and backfill for buried pipe shall conform to the Standard Specifications for Sewer and Water.

Remove lumped subsoil, boulders, and rock. If rock is encountered, remove to provide a clearance of at least 6 inches below and on each side of pipe, valves, and fittings.

Lay and maintain water mains to lines and grades established in the plans with fittings, valves, and hydrants at required locations.

Trench preparation shall proceed in advance of pipe installation only as far as can be backfilled in the same day.

Contractor shall not deviate from types of excavation indicated in the plans without prior concurrence of engineer except in case of roadways, driveways, and obstructions that may be indicated in the plans as open trench sections.

Place and shape bedding material to pipe, to a minimum depth of three inches under bell and four inches under spigot and compact to 95 percent modified proctor density.

Lower water main, fittings, valves, and hydrants carefully into trench, by means of derrick, ropes, or other suitable tools or equipment, to prevent damage to water main materials and protect coatings and linings.

Lay pipe with bell ends facing direction of laying. When grade exceeds 2 feet of rise per 100 feet of trench, bells shall face upgrade.

Provide holes for bells at each joint but no larger than necessary for joint assembly and assurance that pipe barrel will lie flat on trench bedding.

Trench bedding shall be true and even in order to provide support for full length of pipe barrel, except a slight depression may be provided to allow withdrawal of pipe slings or other lifting tackle.

If pipe laying crew cannot put pipe into trench and in place without getting earth into it, engineer may require placing, before lowering pipe into trench, a heavy, tightly woven, canvas bag of suitable size over each end of pipe and leaving there until connected to adjacent pipe.

Do not place debris, tools, clothing, or other materials in pipe during laying operations. Assemble joint and bring pipe to correct line and grade as each length of pipe is placed in trench.

Take precautions to prevent foreign materials from entering joint space and carefully check joint recess for foreign material before installing gasket.

Remove lumps of clay, mud, cinders, and similar materials that may have accumulated on surface of pipe during storage or laying and encase pipe in polyethylene sheeting in accordance to AWWA C105.

Secure pipe in place with bedding material, placed by hand or equally careful means, keeping bell end open. Remove pipe and fittings that do not allow sufficient and uniform space for joints and replace with pipe and fittings of proper dimensions to ensure such uniform space.

Upon daily and temporary completion of pipe installation, close open ends of pipe by a water-tight plug or other means approved by engineer. This provision applies during daytime inactivity as well as overnight.

If water is in trench, maintain pipe seal in place until water level is lowered four inches below pipe invert.

Whenever it becomes necessary to lay a main over, under, or around a known obstruction, contractor shall furnish and install required fittings. Laying of such fittings will be paid for at linear foot price for each size of main. No additional compensation will be paid to contractor for any expenses incurred because of such obstruction.

When an unknown underground structure interferes with work to such an extent that an alteration of the plans is required and alteration results in a change in cost to contractor, engineer will issue a written order for such altered work, specifying basis of payment or credit for such altered work.

Keep interior and exterior of pipe clean and free from foreign material before installation. Provide necessary means to wipe, brush, swab, or air blast to remove any foreign material from interior of pipe as instructed by pipe manufacturer and as directed by engineer.

Provide and place approved bedding sand and cover under and above water service to depths indicated in the plans. Provide and install crushed concrete backfill to depths indicated. Compact bedding sand and cover, and crushed concrete backfill to 95% modified proctor density.

C.3 Water Main Pressure and Leakage Testing

Pressure Testing:

After pipe has been laid, subject newly laid pipe or any valved section thereof to a hydrostatic pressure of at least 1.5 times working pressure at point of testing.

Tests pressures shall:

Not be less than 1.25 times working pressure at highest point along test section.

Not exceed pipe or thrust restraint design pressures.

Be of at least 2-hour duration.

Not vary by more than plus or minus 5 psi for duration of test.

Not exceed twice rated pressure of valves or hydrants when pressure boundary of test section includes closed gate valves or hydrants. NOTE: Do not operate valves in either direction at differential pressure exceeding rated pressure.

Not exceed rated pressure of valves when pressure boundary of test section included closed, resilient seated gate valves or butterfly valves.

Slowly fill each valved section of pipe and apply specified test pressure, based on elevation of lowest point of line or section under test and corrected to elevation of test gage, by means of a pump connected to pipe acceptable to engineer.

Do not operate valves in either opening or closing direction at differential pressures above rated pressure.

Before applying specified test pressure, completely expel air from section of pipe under test.

If permanent air vents are not located at all high points, contractor shall install corporation cocks at such points to expel air as line is filled with water.

After all air has been expelled, close corporation cocks and apply test pressure. At conclusion of pressure test, remove corporation cocks and plug or leave in place at discretion of City of Wauwatosa.

Carefully examine exposed pipe, fittings, valves, hydrants, and joints during test.

Repair or replace any damaged or defective pipe, fittings, valves, or hydrants that are discovered following pressure test with sound material, and repeat test until it is satisfactory to City of Wauwatosa.

C.4 Leakage Testing

Leakage test may be conducted concurrently with pressure test.

Leakage shall be defined as quantity of water that must be supplied into newly laid pipe, or any valved section thereof, to maintain pressure within 5 psi of specified test pressure after air in pipeline has been expelled and pipe has been filled with water. Leakage shall not be measured by a drop in pressure in a test section over a period of time.

No pipe installation will be accepted if leakage is greater than that determined by following formula:

$$L = SD \text{ times Square Root of } P, \text{ divided by } 133,200$$

Where L is allowable leakage in gallons per hour; S is length of pipe tested in linear feet; D is nominal diameter of pipe in inches; and P is average test pressure during leakage test in pounds per square inch gage.

When hydrants are in test section, test shall be made against main valve in hydrant.

Acceptance shall be determined on basis of allowable leakage. If any test of laid pipe discloses leakage greater than that specified, contractor shall, at its own expense, locate and make repairs or replacement.

C.5 Flushing and Disinfection

Place calcium hypochlorite at upstream end of first section of pipe, at upstream end of each branch main, in first pipe section past valve, in hydrant leads, and at a minimum 500 foot interval in main.

Place the following amounts of calcium hypochlorite granules at beginning of main and at each 500-foot interval:

Pipe Diameter (Inches)	Calcium Hypochlorite Granules (Ounces)
4	0.5
6	1.0
8	2.0
12	4.0
16 and larger	8.0

Contractor may use tablets if prior approval is obtained from engineer. Procedure shall be as follows:

- Place one 5-gram calcium hypochlorite tablet in each hydrant, hydrant branch, and other appurtenance.
- Place 5-gram calcium hypochlorite tablets in accordance to the following table in each section of pipe.

Pipe Diameter (Inches)	Length of Pipe Section (feet)				
	<13	18	20	30	40
4	1	1	1	1	1
6	1	1	1	2	2
8	1	2	2	3	4
10	2	3	3	4	5
12	3	4	4	6	7
16	4	6	7	10	13

Based on 3.25 grams available chlorine per tablet, any portion of tablet rounded to next higher integer.

Attach tablets to inside and top at each end of newly installed pipe with an NSF 61 approved adhesive such as ITW Redhead A7, or an approved equal.

Do not apply adhesive to tablet except on broad side to be attached to surface of pipe.

If tablets are attached before pipe section is placed in trench, mark their position on section so it can be readily determined that pipe is installed with tablets at top.

When installation is completed, fill main with water at a rate such that water within main will flow at a velocity no greater than one foot per second.

Contractor shall separately meter and pay for water for filling and initial flushing of main.

Contractor shall provide labor and material necessary to transfer water from source to main to be tested. Only local City of Wauwatosa Water Utility employees shall operate valves.

Water shall enter main and be tested at low point in system to force entrapped air out at high end through an available hydrant or air release valve.

Close upper end hydrant or valve after air is expelled and chlorinated water discharge is present. Take precautions to assure that entrapped air is eliminated.

Water shall remain in pipe for at least 24 hours or as defined by regulatory requirements. If water temperature is less than 40 degrees F, water shall remain in pipe for at least 48 hours.

Position valves so that strong chlorine solution in main being treated will not flow into water mains in active service.

Water from new mains must successfully pass bacteriological test in accordance to requirements of Wisconsin Department of Natural Resources.

Properly and securely brace and maintain excavation until successful testing, flushing, chlorinating, and sampling of main is completed.

Contractor shall be responsible for protecting any required excavation by means of proper barricades and lanterns during sampling and testing period.

Provide access to main for sampling as directed by engineer. Water Utility will take necessary samples of water and obtain laboratory tests of samples.

D Measurement

The department will measure Ductile Iron (DI), Class 55 Water Main, 12-Inch and Ductile Iron (DI), Class 55 Water Main, 8-Inch by the linear foot, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.7101	Ductile Iron (DI), Class 55 Water Main, 12-Inch	LF
SPV.0090.7102	Ductile iron (DI), Class 55 Water Main, 8-Inch	LF

Payment is full compensation for furnishing all materials; and for excavating, backfilling, and compacting; polyethylene sheeting; trench insulation.

85. Copper Water Service, 2-Inch, Item SPV.0090.7103.

A Description

This work includes providing and installing 2-inch copper water service line at locations indicated in the plans, conforming to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and as hereinafter provided.

B Materials

B.1 General

2-inch copper water service material shall be in accordance to ASTM B88, Type K, soft annealed seamless copper tubing.

2-inch closed cell high-density polystyrene sheet insulation, (Blue Board.)

All fittings including saddles, curb stop and box shall meet City of Wauwatosa standards and be approved by the City of Wauwatosa.

All bedding, cover and backfill materials shall meet City of Wauwatosa standards and be approved by the City of Wauwatosa.

C Construction

C.1 General

The location of 2-Inch copper tubing water services shall be installed at locations indicated in the plans. Typical bury depth of service shall be no less than 6-1/2 feet. If shallower

depths are necessary, provide 2-inch closed cell high-density polystyrene sheet insulation and encapsulate all sides of water service with sheet insulation to each end connection.

Connection to existing water main shall be a “wet tap” connection, complete with approved City of Wauwatosa saddle fitting.

Provide and install new and approved curb stop and box meeting City of Wauwatosa requirements.

Provide and place approved bedding sand and cover under and above water service to depths indicated in the plans. Provide and install crushed concrete backfill to depths indicated. Compact bedding sand and cover, and crushed concrete backfill to 95% modified proctor density.

D Measurement

The department will measure Copper Water Service, 2-Inch by the linear foot provided and installed, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.7103	Copper Water Service, 2-Inch	Each

Payment is full compensation for furnishing all materials; excavating, backfilling, and compacting.

86. Survey Project 1060-34-73, Item SPV.0105.0001.

A Description

Perform work conforming to standard spec 105.6 and 650.

This special provision describes modifying standard spec 105.6 and standard spec 650 to define the requirements for construction staking for this contract.

Replace standard spec 105.6.2 with the following:

The department will not perform any construction staking for this contract. Obtain engineer’s approval prior to performing all survey required to layout and construct the work under this contract.

The survey includes establishing horizontal and vertical position for all aspects of construction including but not limited to building layout, storm sewer, sanitary sewer, water main, subgrade, base, curb and gutter, structure layout, pavement, electrical installations, supplemental control, slope stakes, parking lots, utilities, landscaping elements, fencing, etc.

The department may choose to perform quality assurance surveys during the project. These quality assurance surveys do not relieve the responsibility for performing all survey work required to lay out and construct the work under this contract.

Delete standard spec 650.1.

B (Vacant)

C Construction

Conform to standard spec 650.3 and as modified in this special provision.

Replace standard spec 650.3.3.1 with the following:

Under the Survey Project bid item, global positioning system (GPS) machine guidance for conventional subgrade staking on all or part of the work may be substituted. The engineer may require reverting to conventional subgrade staking methods for all or part of the work at any point during construction if, in the engineer's opinion, the GPS machine guidance is producing unacceptable results.

Replace standard spec 650.3.3.3.4.1 with the following:

The department will provide the contractor staking packet as described in the Construction and Materials Manual (CMM) 7.10. At any time after the contract is awarded, the available survey and design information may be requested. The department will provide that information within 5 business days of receiving the contractor's request. The department incurs no additional liability beyond that specified in standard specification 105.6 or standard specification 650 by having provided this additional information.

Add the following to standard spec 650.3.3.3.6.2:

Record all subgrade elevation checks and submit a hard copy to the engineer at the completion of the project.

D Measurement

Replace standard spec 650.4 with the following:

The department will measure Survey Project 1060-34-73 as a separate single lump sum unit of work, acceptably completed.

E Payment

Replace standard spec 650.5 with the following:

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0001	Survey Project 1060-34-73	LS

Payment is full compensation for performing all survey work required to lay out and construct all work under this contract. No additional payments will be made for restaking due to construction disturbance and knock-outs.

SEF Rev. 13_0925

87. Pavement Cleanup Project 1060-34-73, Item SPV.0105.0002.

A Description

This special provision describes cleanup of dust and debris from pavements within and adjacent to the job site.

B Materials

B.1 Pavement Cleanup

Furnish a vacuum-type street sweeper equipped with a power broom, water spray system, and a vacuum collection system.

Vacuum equipment shall have a self-contained particulate collector capable of preventing discharge from the collection bin into the atmosphere.

Use a vacuum-type sweeper as the primary sweeper, except as specified herein or approved by the engineer.

C Construction

C.1 Pavement Cleanup

Keep all pavements, curb lanes and gutters both closed and open to public traffic within the job-site boundaries free of dust and debris generated from any activity under the contract. Keep all pavements, curb lanes and gutters adjacent to the project free of dust and debris that are affected by land disturbing, dust generating activities, as defined in the contractor's dust control implementation plan.

Provide surveillance to identify if material is being tracked from the jobsite. Clean up spillage and material tracked from the project within an hour of occurrence or as directed by the engineer. Perform cleanup operations in a safe manner.

Provide routine sweeping of all pavements, curb lanes and gutters on local street active haul routes a minimum of once a day as defined in the Dust Control Implementation Plan (DCIP) or as directed by the engineer.

In addition to routine sweeping, conduct sweepings as the engineer directs or approves, to deal with dust problems that might arise during off-work hours or emergencies. Provide the engineer with a contact person available at all times to respond to requests for emergency sweeping. Respond to emergency sweeping requests within 4 hours.

If the vacuum-type sweeper breaks down, a mechanical broom sweeper may be substituted for no more than 24 hours total elapsed time. Repair the vacuum-type sweeper within that 24 hours or substitute a vacuum-type sweeper.

Skid steers with mechanical power brooms may only be utilized on sidewalks and driveways whose pavements will not support the weight of a street sweeper, unless otherwise approved by the engineer.

D Measurement

The department will measure Pavement Cleanup Project 1060-34-73 as a single lump sum unit of work, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0002	Pavement Cleanup Project 1060-34-73	LS

Payment schedule for this item will be in accordance to the percentage of contract value earned.

Payment is full compensation for surveillance, mobilization, sweeping, disposing of materials.

SEF Rev. 12_1008

88. Moving Salt, Item SPV.0105.0003.

A Description

Pick up and move all salt from the temporary salt storage shed and place in the permanent dome, in accordance to the plan details, and as hereinafter provided. The quantity of salt to be determined at the project mandatory pre-bid meeting.

B (Vacant)

C Construction

Pick up and move the salt without damaging the temporary salt shed or the roadway between the temporary salt shed and the new salt dome. If either is damaged, replace damaged building component or repair roadway at contractor expense.

D Measurement

The department will measure Moving Salt by the lump sum unit of work, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0003	Moving Salt	LS

Payment is full compensation for picking up and moving the existing salt.

89. Moving State-Owned Materials, Item SPV.0105.0004.

A Description

Pick up and move department-owned materials from the existing shared state/county DOT yard to the storage area, in accordance to the plan details, and as hereinafter provided.

B (Vacant)

C Construction

Pick up and move the department-owned materials without damaging the materials or adjacent structures. If either is damaged, replace damaged materials or structures at contractor expense. The material shall be placed in a similar fashion to existing condition. Coordinate with the engineer and WisDOT Maintenance staff, Kevin Peiffer, (414) 257-6567, as to which materials shall be moved and the final location of the materials.

D Measurement

The department will measure Moving State-Owned Materials by the lump sum unit of work, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0004	Moving State-Owned Materials	LS

Payment is full compensation for picking up and moving the state-owned materials.

90. Static Scale System, SPV.0105.0005.

A Description

This special provision describes furnishing and installing a fully electronic, pit type, commercial motor vehicle scale with a minimum weighing platform for the purpose of weighing loaded plow and quad axle trucks. The scale shall be furnished and installed complete as specified as follows, including weighbridge, foundation, platform reinforcing, pit coping, load cells, indicators, surge voltage protection system and the services of the manufacturer's service representative. Equipment shall be designed to function in an extreme cold and corrosive environment.

Equipment furnished and installed shall be assembled, erected and placed in proper operating condition in full conformity with drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer unless exceptions are noted by the engineer.

Scale and components shall have been issued a Certificate of Conformance (COC) by the National Type Evaluation program (NTEP) and shall meet the requirements set forth by the National Institute of Standards and Technology (NIST), Handbook 44, "Specifications, Tolerances, and Technical Requirements for Weighing and Measuring Devices". The following specifications represent the minimum static scale requirements.

B Materials

B.1 The Static Scale

Furnish and install one pit type truck scale with a minimum gross capacity of 75 tons (150,000 lbs.) and a minimum weighing platform of 40' x 10' wide. Equipment to consist of parts designed to act as a unit by a manufacturer that has a minimum of five years of experience in design, construction, and operation of equipment for the purpose required.

The platform shall have 24 inch manholes located to facilitate future maintenance.

B.2 Load Cells

The weighing elements shall be stainless steel, hermetically sealed load cells to guard against moisture ingress and barometric effects. Load cells shall be designed to allow for routine cleaning and maintenance without damage to the cell. Load shall be applied to the cells without the use of links, bolts, pins cables or flexure. The scale shall have self-diagnostic capabilities able to identify load cell problems and failure.

B.3 Scale Pit

Furnish and install the scale pit according to the manufacturer's specifications. The weighbridge and load cell assemblies shall be supported by a reinforced concrete pier type or full slab foundation as indicated on the manufacturer's foundation drawings. The dimensions for the scale foundation and platform shall be as recommended by the equipment manufacturer and accepted by the engineer. Reinforcing steel placement and structural steel embedment placement shall be performed as shown on the manufacturer's foundation drawings. Furnish and install any manholes, inlets, pipes, and connections to storm sewer as required to drain the pit.

B.4 Driver Interface Terminal

Drivers will interact with the Driver Interface terminal in one of two ways. Internal users will have an RFID unit and external customers will not.

Furnish and install one driver interface terminal. Equipment to consist of parts desired to act as a unit by a manufacturer experienced in design, construction, and manufacture of electronic components, and operation of equipment for the purpose required. The driver interface terminal shall be designed to be an unattended system. The display shall be a full graphic, alphanumeric LED back-lit display with the capability to prompt the operator

through all operations with true alpha characters. Segmented LED alphanumeric displays are not acceptable.

Terminal location shall be field fit to meet the purpose of the device. Driver's operating the scale must be able to operate all functions of the driver interface terminal and collect the paper tickets without exiting the vehicle. The terminal shall be placed to promote proper positioning of the vehicle on the scale. The driver interface terminal must have a manual touch keyboard or touch screen. The terminal prompts and input data shall be fully customizable by the owner. The terminal shall have the availability to print a paper ticket upon completion of the user interaction/weighing process. The data printed on the ticket must be fully customizable by the owner to include, but not limited to items such as:

- Department/unit
- Site location and ID
- Date and time
- Title (Static scale weights: Report)
- Total gross weight
- Tare weight
- Net weight
- Truck number

The scale system shall include an electronic vehicle identification system through RFID. Supply 125 RFID modules for use by internal customers. The scale system shall be customizable and have the capability to store the following information related to the RFID system:

- Department
- Truck Number
- Truck Tare
- Driver Name

B.5 Static Scale Operation Specifications

The scale system must have the ability to retain all saved data in the event of power loss. All settings and saved data must be retained.

The system must contain a real-time clock with 12 hour AM/PM and 24-hour, month/day/year date format. Two or four digit year date selectable.

The scale instrument shall be capable of being programmed and calibrated in pounds, tons or kilograms.

The system must be able to store tare weights and associate them with truck numbers.

B.6 Remote Interface

The system shall have the capability to send information wirelessly from the scale, and its components, to a remote location. Information must be able to be sorted, searched,

tabulated, and put into a printable report form. The owner must be able to customize the information. The information sent to the remote location shall consist of, but not limited to:

- Department/unit
- Site location and ID
- Date and time
- Title (Static scale weights: Report)
- Total gross weight
- Tare weight
- Net weight
- Truck number

B.7 Remote Display Requirements

Supply one remote display and all poles and mounting hardware. The remote display shall be hard-wired to the scale. The remote display must have the capacity to display the anticipated weight values. The display shall be of fluorescent yellow or red in color, and be visible at night and low visibility situations.

Supply one traffic light at the remote display location to assist the driver with stopping and leaving the scale. A red light shall appear to the driver during the weighing process and a green light shall appear to the driver when weighing is complete. The traffic light must be visible at night and low visibility situations. The traffic light may be incorporated into the remote display described in other sections of this specification.

B.8 Lightning Protection Specifications

A comprehensive lightning protection system shall be provided with the scale. Static scale system shall have been tested and passed lightning simulated lightning strike up to 80,000 amperes. The system shall not require complicated wiring or devices to provide this protection. Major scale components including load cells and scale instrument shall be included in the lightning protection system. Verification of lightning protection system performance shall be available in writing from the manufacturer upon request. Electrical diagrams of the scale grounding and surge protection shall be supplied with submittals. The surge voltage package shall be provided as a unit and be tested and approved by the scale manufacturer.

C Construction

C.1 Submittals

Submit complete foundation and installation drawings, together with detailed specifications and data covering materials, parts, devices and accessories. Drawings shall cover all scale components, foundation details, and pier loading information necessary for the design of the scale foundation or installation. Submit any relevant manufacturer information, including user manuals, instructions and warranty information. Submit any required certifications and testing documentation.

C.2 Training

Upon completion, an experienced, competent, and authorized representative of the manufacturer shall set up and conduct training for WisDOT and Milwaukee County personnel on the operation, maintenance, calibration, installation and repair of the equipment specified under this specification.

D Measurement

The department will measure Static Scale System, completed in accordance to the contract and accepted, as a single complete lump sum unit of work.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0005	Static Scale System	LS

Payment is full compensation for furnishing and installing all materials; coordinating and making all utility hook-ups including drainage; making the system operational; calibrating; testing and providing required training.

91. Removing Former Sheriff's Building Structure, Item SPV.0105.0006.

A Description

A summary of the appraisal report for the existing hotel building structure is on file and available for inspection at the Wisconsin Department of Transportation Southeast Region Office Building, 141 NW Barstow Street, Waukesha, WI 53187-0789. A site visit of the Former Hotel Building Structure site is strongly recommended by all perspective bidders and demolition subcontractors.

Work under this item consists of Removing Former Sheriff's Building Structure located at 10190 West Watertown Plank Road, Wauwatosa, WI 53226 and disposing of all debris and resulting materials in accordance with standard spec 204, and as hereinafter provided.

B (Vacant)

C Construction

C.1 General

A site visit of the Former Sheriff's Building Structure site is strongly recommended by all perspective bidders and demolition subcontractors.

Prior to the demolition of the Former Sheriff's Building Structure under this contract, others will remove asbestos containing materials. The building structural and non-structural components will remain for demolition and removal under this contract.

Conduct removal work in a prudent manner and exercise care to preclude damage to any adjacent buildings. The contractor is responsible for any damage caused by his operations to adjacent buildings. Keep abutting roads, public places, and private property adjacent to the building being removed in a debris or litter-free condition throughout the removal process.

Removal of the existing building foundation and footings are included in this item.

All materials generated during demolition activities are the property of the contractor. Dispose of unclaimed and removed material as specified for disposing of materials in standard spec 203.3.4. Do not burn building to remove. Comply with Wisconsin Department of Natural Resources (DNR) air pollution control rules per standard spec 201.3.

C.2 Demolition Plan

The contractor is responsible for the methods and sequence of demolition, including effects on the overall stability of the building structure being removed. Prior to mobilization to the site, submit the Demolition Plan for review to ascertain compliance with the requirements specified. Include the methods and procedures used to perform demolition and the sequencing and scheduling of demolition, including:

1. The name of the contractor's on-site-employee designated in responsible charge of all removal operations.
2. Methods of removal, proposed haul route(s) and disposal, the proposed haul route, method of hauling, and proposed destination.
3. Acknowledgement that the contractor has visited the site and reviewed the existing structure plans in preparing the removal plan.

Provide two copies of the removal plan and analysis computations to the engineer at least two weeks prior to beginning removal work for review and acceptance.

It is understood that whether or not the engineer concurs in the removal plan as submitted or revised, the contractor will in no way be relieved of the responsibility of providing a safe and controlled removal operation.

C.3 Notice to Department of Natural Resources

Prior to commencement of any demolition activities, notify the Southeast Regional Office of the Wisconsin DNR located at 2300 N. Dr. Martin Luther King Dr., P.O. Box 12436, Milwaukee, WI 53212, Phone (414) 263-8500, at least ten business days in advance of the contractor's intent to raze the Former Sheriff's Building Structure. In the notice to DNR, include the address and type of building to be razed, the proposed date that the building will be razed, and the name of the licensed or approved landfill where the demolition waste will be disposed. Mail a copy of this notice, within ten days of DNR notification, to the WisDOT SE Region, Attn: Kurt Flierl, PO Box 798, Waukesha, WI 53187-0798.

C.4 Hazardous Materials

C.4.1 Lead Based Paint

Lead Based Paint (LBP) may be present on the steel components of the building structure to be removed under this contract. The contractor is responsible for determining if LBP is present. If LBP is found to be present, develop a protocol for its handling and management. All activities shall be conducted in a Lead Safe manner in accordance with OSHA 29 CFR 1926.62 and other applicable regulations.

C.4.2 Asbestos

If asbestos is encountered, immediately cease razing operations on the site and notify the engineer. The department will hire a private consultant to remove any asbestos containing materials that may be encountered.

C.4.3 Underground Fuel Storage Tanks

If tanks are discovered on the site during razing that were not removed as part of or in the absence of an Environmental Site Assessment, immediately cease razing operations on the site and contact the engineer. The department will hire a private consultant to remove the discovered tanks.

C.5 Custody of the Building

Upon written order by the department representative to commence work, the building and surrounding property shall be under the custody of the contractor. Nothing in this proposal shall be interpreted as setting forth the condition of the building or the appurtenances thereto. Except as otherwise provided herein, it is to be understood that the department accepts no responsibility for the protection of the building and appurtenances against damages sustained either prior to or subsequent to the time of the letting of the work under this contract.

While the building is in the contractor's custody, keep the building in a closed condition. The contractor shall take such measures as are necessary to safeguard the public from damages or injury. Do not remove doors or windows from the building until the actual day of razing, unless all openings are sealed as approved by the engineer. Only the contractor and his subcontractor shall salvage building components. At all times, do not allow the public in the building or on the grounds.

C.6 Building Demolition and Removal

Perform work in accordance with standard spec 204 and as hereinafter provided.

Furnish all labor, equipment, tools, transportation and incidentals necessary for the performance of the work. Secure and pay for all permits that are required for the demolition work.

Prepare site, including the installation and maintenance of all barriers, barricades, warning signs, fencing, and all other items as required for the proper protection of persons on the site, members of the public, and property. Leave no hazard unmarked and unprotected after demolition is complete.

Remove all concrete steps, concrete sidewalks, and concrete slabs from the premises. Remove existing parking lot lights, light poles, and bases. Safely disconnect power to the lights and remove electrical appurtenances. Remove all miscellaneous improvements from premises.

Notify public utility companies serving the building in sufficient time, before removal operations, to allow them to disconnect and remove their facilities from the building.

Abandon all water service lines and sanitary sewer laterals in compliance with all ordinances, statutes, regulations, and permit requirements of the municipality in which the building is situated and those of the State of Wisconsin.

Remove heating units, fixtures, and similar appurtenances to the elevation of the basement floor. Remove all furniture, miscellaneous furnishings, miscellaneous appliances, mailboxes, and all other relevant yard improvements and debris.

Until standing walls have been razed, safely brace existing walls at all times to ensure complete safety during the wrecking operations. Excavate as required to remove building structure from the premises.

Break and remove entirely from the site all basement walls, floors and footings. Remove footings up to their bottom elevation above gravel bed.

Dispose of all non-hazardous demolition waste in a landfill licensed or approved in writing by the Department of Natural Resources and in accordance with NR500, Wisconsin Administrative Code. Failure to properly dispose of solid waste is a violation of State Solid Waste Statutes and Administrative code and is subject to issuance of a citation under Wisconsin Statute 287.81(2)(a).

Remove all material from the premises in a safe manner and in compliance with all applicable laws and ordinances. Do not disturb adjacent property. At the end of each day's work, leave site in a safe and secure condition so that no part of the existing building is in danger of toppling or falling and unauthorized admittance is prohibited.

C.7 Disposal of Material

Supplement standard spec 104.8 with the following:

Clear the entire premises of all decomposable and combustible refuse, debris and materials resulting from the removal of the building. Upon completion of the work, leave the entire premises in a neat condition. Do not deposit or leave decomposable or combustible refuse, debris, or materials resulting from the removal of the buildings including any exposed openings resulting from razing activities.

Do not bury materials on site. Use all reasonable means to divert demolition waste from landfills and facilitate recycle or reuse material generated during demolition.

Provide all waste disposal, including loading, transporting, and disposing of all debris, rubble, or trash that results from Removing Former Sheriff's Building Structure. Take all materials designated for disposal to a Wisconsin DNR-approved solid waste disposal facility or at contractor's construction debris disposal site, as appropriate.

C.8 Backfill

Ensure that all exposed openings are free of all refuse and debris.

Backfill exposed openings in accordance with standard spec 204.3.1.2. Compact backfill in accordance with standard spec 207.3.6.2. Furnish backfill meeting the requirements of standard spec 209 for use as backfill material.

C.9 Fencing

After removing the building, furnish and erect suitable fencing around the exposed openings resulting from excavation, to protect and safeguard the public from all hazardous conditions created by the operations. Install the fencing in such a manner to ensure that the public is prevented from falling into any openings. The fence shall be a height of 52-inches, and the posts shall be at least 58-inches high and spaced at a distance no greater than 10-feet apart. Remove the fencing after all open excavations have been backfilled satisfactorily.

D Measurement

The department will measure Removing Former Sheriff's Building Structure as a single lump sum unit of work, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0006	Removing Former Sheriff's Building Structure	LS

Payment is full compensation for preparation of all submittals; for all excavating; for all concrete removal; for design and erection of temporary supports, shoring and bracing; for handling, removing, and disposing of components with Lead Based Paint; for building foundation and footing removal; for building removal; for contacting the Wisconsin DNR; for obtaining and paying for all required permits; for notifying utility companies; for disconnecting and abandoning utilities, sewer, and water services; for removing light poles and light foundations as outlined in this specification; for furnishing, placing and compacting backfill material; for disposing of removed surplus materials including loading, transporting, and unloading; for restoring the work site; for furnishing, installing and removing fencing, barriers, barricades, warning signs, and all other items as required for proper protection; for removing and disposing of heating units, fixtures, and similar appurtenances; for removing and disposing of all miscellaneous furniture, furnishings, and appliances.

92. Salt Dome, Item SPV.0105.0101.

A Description

This special provision describes designing, furnishing and erecting a 150-foot diameter salt storage dome with prefabricated modular wood panels, asphalt roofing shingles, roof vents, overhead door, fans, electrical systems, and appurtenances as shown on the plans; designing and constructing the concrete building foundation and wall; excavating and backfilling in accordance to standard spec 206; proportioning, mixing, placing, and protecting concrete in accordance to standard spec 501; furnishing and placing reinforcement in accordance to standard spec 505; and as specified herein.

The building shall be dome shaped, self-supporting with no internal supports inside to hamper loading and unloading of material complete with one 20-foot wide by 40-foot tall doorway opening. The Salt Dome shall be of sufficient size to store a minimum of 20,000 tons of deicing salt based on the weight of 80 lbs. per cubic foot. Storage of piled salt shall have a repose angle of 32 degrees. Totally unobstructed and usable floor area within the interior walls shall be approximately 17,670 square feet. The building shall be 85 feet high and shall include built-in fan dormers for two 30-inch diameter exhaust fans as specified herein.

The roof is defined as the prefabricated modular wood panels that make up the dome structure. Provide a three year warranty (one year performance bond plus two year warranty bond) on the dome roof. Include labor and materials in the warranty.

Asphalt roofing shingles are defined as self-sealing, architectural shingles with a fiberglass core. The roofing shingles must carry a minimum manufacturer's warranty of 50 years.

Asphalt paved flooring is not included in this bid item. Asphalt paving will be paid for under the HMA Pavement bid item.

A.1 Quality Assurance

Building Manufacturer:

The manufacturer of the dome materials shall be a business regularly engaged in the manufacture, assembly, and construction of equipment required for this project. The manufacturer shall have at least five years of successful experience in providing design and construction of the type of structure required for this project.

Materials:

Provide materials that have a proven performance record. The contractor is responsible for all products, components, accessories, and methods used in constructing the building.

The minimum printed code standard requirements of the following organizations for material quality, fabrication, and installation procedures shall be met or exceeded, for applicable methods employed in the building design:

- American Institute of Steel Construction (AISC)
- American Concrete Institute (ACI)
- American Institute of Timber Construction (AITC)
- American Iron and Steel Institute (AISI)
- American Plywood Association (APA)
- American Softwood Lumber Standard: U. S. Department of Commerce PS-20
- ASTM International (ASTM)

A.2 Submittals

Furnish the following information as proof of conformity to design and performance criteria requirements of this specification. All submittals shall be stamped and signed by a professional engineer licensed to practice in the State of Wisconsin.

In the case of prefabricated buildings and proprietary design, submit advertising literature depicting the proposed building.

Provide all pertinent shop drawings, structural design information and submittals to the engineer prior to ordering and installing any materials required for the work. The engineer must approve all materials, design information and submittals prior to the contractor ordering and installing any materials required for the work. The engineer will review this submittal and respond to the contractor within two weeks. The required shop drawings include, but are not limited to:

- Letter of Design Certification, signed and sealed by a licensed professional engineer including the following:
 - Name and location of the project.
 - Order number.
 - Name of manufacturer.
 - Name of contractor.
 - Building dimensions including diameter, height, and roof slope.
 - Governing building code and year of edition.
 - Design loads (dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration and auxiliary loads).
 - Load combinations (indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code).
 - Building-use category (indicate category of building use and its effect on load importance factors).
- Delegated-Design Submittal: For salt storage building systems indicated to comply with performance requirements and design criteria, including analysis data and calculations signed and sealed by the licensed professional engineer responsible for their preparation.
- Product Data: For each type of salt storage building system component.
- Shop Drawings: For salt storage building system components (include plans, elevations, sections, details, and attachments to other work) including:

- Concrete footings and foundations.
- Steel reinforcement.
- Metal plates and fasteners.
- Wood products.
- Roof panels.
- Wall systems.
- Flashings.
- Barrier walls.
- Doors and frames.
- Overhead door.
- Electrical and lighting systems.
- Exhaust Fans.
- Site work.
- Accessories.
- Warranties.

A.3 Building Permit

After the engineer approves all materials, design information and submittals required for the work, the contractor's plans must also be reviewed and approved by the State of Wisconsin Department of Commerce. Submit plans and fees to the Department of Commerce to obtain a building permit. If the plans are not accepted, revise the plans and repeat the process until the necessary approvals are obtained. The contractor is responsible for all review and permit fees and any associated inspection costs. Allow four weeks for plan review and approval by the Department of Commerce.

A.4 Warranty and Warranty Bond

The required warranty period for the Salt Dome roof, as described in Section A.1, shall be a minimum of 3 years after final acceptance of the Salt Dome (one year performance bond plus two year warranty bond).

The bonding company must have an A.M. Best rating of "A-" or better and the contractor shall provide proof of a 2-year bond commitment before execution of the contract. The Milwaukee County Department of Public Works shall be named as obligee on the warranty bond.

The warranty bond shall be \$50,000. The bond will ensure the proper and prompt completion of any required warranty work for the duration of the warranty period, including payments for furnishing all labor, equipment and materials used according to this specification as prescribed in Section C.10 Warranty Work.

If a subcontractor places the warranted roofing, the subcontractor may provide a dual obligee bond naming the contractor and the Milwaukee County Department of Public Works as obligees.

Failure of the contractor, subcontractor or its surety to issue or renew the warranty bond will be considered a default and will result in forfeiture of the face amount of the bond to the Milwaukee County Department of Public Works.

Perform or commence all warranty work within 15 calendar days of the engineer's written authorization

All warranty work will be as prescribed in Section C.10 Warranty Work of this article. At the end of the warranty period, the contractor will be relieved of the responsibility to perform further warranty work, provided all previous warranty work has been completed.

Maintain insurance, in the course of performing warranty work, as specified in standard spec 107.26 throughout the 3-year warranty period.

A.5 Code Compliance

Build the structure in conformance with all applicable codes.

B Materials

B.1 General

Furnish a 150-foot diameter salt storage dome shaped structure mounted on top of a 14-foot tall sealed concrete wall and constructed with prefabricated modular wood panels, a protective canopied entranceway, concrete wing walls with a height of 14 feet, and asphalt shingles.

B.2 Foundation Excavation

Furnish Backfill Granular in accordance to the pertinent requirements of standard spec 209 for use as backfill material.

B.3 Prefabricated Structure

The dome structure shall be designed to withstand a ground snow load of 30 psf and a wind load of 90 mph. Coefficients shall be applied to the ground snow load to change it to roof snow load and further adjustments made to allow for the slope of the dome panels. Also the wind load shall be adjusted to allow for the slope of the dome panels. Provide an entrance opening with a width of 20 feet and a height of 40 feet as shown on the plans.

The dome structure shall be designed to support a dome loading belt conveyor.

B.3.1 Lumber

The outside framing members shall be minimum 2x6, and interior studs shall be minimum 4x4. The grades shall be S.P.F. species or better, #2 grade or better. Maximum moisture content shall be 19% air or kiln dried. All lumber shall conform to American Softwood Lumber Standard PS-20 latest edition.

All above-ground lumber exposed to weather, or directly in contact with salt, shall be preservative treated with water-borne preservatives for above-ground use, complying with AWWA-LP-2 (CCA .40).

B.3.2 Plywood

The plywood shall be 5/8-inch thick, exposure 1 with exterior glue, APA rated. All plywood shall be Agency rated and conform to PS-1 latest edition.

B.3.3 Glue

The glue for the dome's prefabricated modular wood panels only shall be a waterproof resorcinol resin, factory mixed, applied, and cured per glue manufacturer's instructions.

B.3.4 Hardware

The hardware used to assemble the stress skin panels on site shall be minimum 5/8-inch diameter hot dip galvanized bolts with 2 3/4-inch square washers, also hot dip galvanized. No smaller than 5/8-inch diameter bolts will be accepted to connect the structural panels together. All nails and staples used in the manufacture of the panels shall be galvanized.

B.4 Reinforcing**B.4.1 Reinforcing Steel**

Furnish deformed steel reinforcing bars conforming to AASHTO M31, Grade 60. The steel reinforcing bars shall be epoxy coated.

B.4.2 Anchor Bolts

Anchor bolts shall be unfinished grade ASTM 5/8-inch minimum diameter designation A307 with minimum yield strength $F_y = 36$ ksi. The anchor bolts shall be hot dipped galvanized.

B.4.3 Metal Accessories

Furnish all spacers, chairs, ties and other devices necessary for the proper spacing, supporting and fastening of the reinforcing steel in place.

B.5 Concrete Wall**B.5.1 General**

The retaining wall shall be a reinforced concrete wall 14 feet above finished grade as shown on the plans. The retaining wall shall be designed to withstand the pressure of the stored material and the dome structure's design loads and all applicable load combinations. After concrete curing, the inside of the retaining wall shall be coated with two applications of a mixture of 50% mineral spirits and 50% linseed oil or equal.

Provide a minimum cover over the top of the footing as recommended in the Geotechnical Report.

Design the retaining wall to resist the weight (i.e., forces) of salt stored against it.

Provide design calculations showing that the proposed wall system meets loading and code requirements and is stamped and signed by a licensed professional engineer registered in the State of Wisconsin.

B.5.2 Geotechnical Report

A geotechnical report for the site has been prepared and is available from Jeff Bohen, PE at 141 NW Barstow Street, Waukesha, WI 53187, telephone (414) 750-2928.

The contractor shall be responsible for reproduction costs of any copies requested.

B.5.3 Formliner

Use reusable form liners that are made of highway strength urethane or lightweight one time use elastomeric foam form liners that attach easily to the forming system, and do not compress more than 1/4-inch when poured at a rate of 10 vertical feet/hour.

Formliner shall have a smooth, horizontal brick pattern with round joints. Individual bricks shall be rectangular in shape separated by 1/2-inch wide horizontal and vertical mortar lines. Individual brick dimensions shall have a length of 7 1/2-inches and a height of 2 1/2-inches. Relief of the formliner shall be 1/4-inches.

Use a release agent that is compatible with the form liner and coloring materials.

Wall ties shall have set "break-backs" at a minimum of 3/4-inches from the finished concrete surface.

B.5.4 Concrete Staining

Use concrete stain manufactured for use on exterior concrete surfaces. Use the following products, or equal as approved by the engineer, as part of the finish system:

Tri-Sheen Acrylic by TK Products
TK-5272 Tri-Sheen Pigmented Stain
B-97-200 Series Concrete Stain by Sherwin Williams
(*Natural Look)

B.6 Roof

B.6.1 General

The roof slope, except for the doorway canopy, shall not be less than 26 degrees to reduce snow and ice build-up, roof leaking, and ensure longevity of the shingles and building as a whole.

B.6.2 Asphalt Shingles

Both the dome and canopy entrance roofing material shall be standard, self-sealing, architectural asphalt roofing shingles having a fiberglass core carrying a minimum manufacturer's warranty of 50 years with 30-lb felt underlayment. The shingles shall be installed with large head, galvanized roofing nails as per the manufacturer's instructions.

Material for underlayment of shingle shall be non-perforated, 30 lbs. per 100 sq. ft. asphalt saturated felt, 32 or 36 inches in width conforming to ASTM designation D-226-68.

The color of the shingle shall be Weather Wood per the approved City of Wauwatosa Design Review Board sample. At least 15 working days prior to the start of shingle placement on the dome, supply one 3-foot x 3-foot panel sample of the asphalt shingles for approval by the engineer.

B.6.3 Canopy

Canopy entrance and exterior sidewalls shall be covered with standard double-4 vinyl siding. Siding shall also be placed on any dormer sidewalls that are located on the dome structure. Siding shall be white in color. Vinyl siding shall have a minimum 50-year manufacturer's warranty. The canopy entrance roof material is described in Section B.6.2.

B.7 Electrical Work

Provide power to the building and furnish and install all lighting, wiring, and other electrical equipment as shown on the plans.

Power to the Salt Dome building shall be 208Y/120-Volt, 3-phase, 4-wire, 60 hertz unless otherwise approved by the engineer. Contractor shall confirm power supply with engineer prior to beginning work. On the exterior side of the entryway, the dome installer shall install a heavy duty panelboard (LP-D), 208Y/120-volt, 3-phase, 4-wire, 100A copper bus, 50A/3P main circuit breaker, NEMA 3R, with appropriate circuit breaker and wiring to power the following:

- Furnish two electrical outlets next to the electrical breaker panel in accordance to local code requirements.
- Furnish LED, corrosion resistant light fixtures with all necessary switches and wiring to the fixtures and to the electrical fan. Light fixtures shall be positioned as follows on the appropriate location:
- Four interior fixtures.
- One exterior fixture mounted over the canopy of the entranceway. Exterior fixture shall have photo-cell switch and AUTO/OFF switch.
- All exterior conduits shall be galvanized metal – Rigid Galvanized Steel (RGS). All interior conduits to be non-metallic Schedule 40 PVC.
- All pull boxes and junction boxes inside the structure shall be non-metallic PVC, weatherproof and corrosion resistant. They shall be firmly attached to the walls of the structure. Install a switch on the exterior of the dome for controlling interior lights.
- Install a lockable NEMA 3R weatherproof panelboard with a main breaker and circuit breakers as noted above, to control lighting, outlets, power to the fans and door operator. Mount the panelboard firmly to the exterior of the concrete wall near the entrance and door.
- Furnish, install and provide power for two electrical exhaust fans located one on each side of the Salt Dome. The contractor is responsible for hook-up of exhaust fans.
- Place all electrical underground conduits prior to commencement of pad construction.
- Conduits to be routed where least likely to be damaged by vehicles.

- Fans, door opener and lighting associated with the dome building shall be wired back to the electrical panelboard located on the exterior of the building as indicated previously.
- Luminaires in the salt storage dome shall be LED type high bay fixtures. Units shall be certificated for use in a damp location and 65 degree C environment, lumen output of 24,000 or greater with a 4,000 K color temperature and a wide light distribution pattern. Units shall be auto voltage serving from 120V to 277V with a 20 kA in line surge protection. Units shall not be fused at the luminaire. Lumens per watt shall be greater than 100 and the fixture shall have a projected lumen maintenance rating of greater than 0.85 at 65 degrees C for 100,000 hours. Units shall be hook mounted and have a 3 foot safety chain. Provide bird spikes for any horizontal surface of each luminaire.
- The Luminaire mounted on the exterior of the salt dome shall be an LED flood light with a 6x6 distribution, 4000K CCT, auto voltage sensing (120V–277V) driver and UL 1598 listed for a wet location. The luminaire shall have a gasketed borosilicate prismatic glass lens for an IP65 rating. Unit shall produce a minimum of 25,000 lumens with a lumen to watt ratio of 90 or better. The LEDs shall have a L70 (25 Deg C) rating of over 100,000 hours. The LED driver shall have a rated life of 100,000 hours. The integral surge protection device shall provide an IEEE/ANSI C62.4, Category C level of protection. Unit to be yoke mounted.

B.8 Exhaust Fans

Furnish two heavy-duty electrical exhaust fans. The fans shall be 208V, 3 phase, corrosion resistant with a gravity shutter. Fans and shutters shall have two coats of corrosion resistant paint. The fans shall be 30-inch diameter and 1.5 H.P. with 11,600 CFM at 0-inch static pressure.

Provide a fusible combination motor starter with NEMA 4 rated enclosure. Provide ON/OFF switch, rated NEMA 4, for control of fans. Fans to be powered from the lighting panel provided with the dome.

B.9 Overhead Door

Provide an unobstructed rectangular entrance opening with nominal dimensions to be 40 feet high by 20 feet wide. In the opening, provide an upward acting rolling overhead door designed for a 20 psf minimum wind load. Door shall be made of aluminum. When in the fully open position, the overhead door shall not impede loading and storage of salt or violate conveyor clearances. Supply and install all wood head and jamb framing and blocking as called for by door manufacturer.

A chain hoist to provide capability for manual operation of the door shall be included.

Electric door operator shall be jack shaft, side mounted, model as recommended by door manufacturer for door size and lift condition, with standard hardware operable both from inside and outside of building. Motor to be 208V, 3 phase, maximum 5 Hp. Provide OPEN/STOP/CLOSE pushbuttons rated NEMA 4.

B.10 Finishes

Flashings shall be a minimum of 0.017-inch aluminum material.

C Construction

Coordinate with the dome loading belt conveyor manufacturer and installer to ensure that the structural integrity of the dome is not compromised by the installation of the conveyor, which will be supported from the dome roof.

Coordinate with the engineer in the field for the final door opening and dome loading belt conveyor orientations at least 15 working days prior beginning construction of the salt dome.

C.1 Earthwork and Foundation Excavation

Prepare the site for the building so that the grade within the building area is level to within plus or minus 2 inches, and so that the grade of the surrounding area slopes away from the building in all directions sufficiently to ensure proper drainage. Excavate and backfill to proposed grade for the foundation footings. Compact backfill in accordance to standard spec 207.3.6.2. Coordinate with grading and excavation on site.

C.2 Prefabricated Structure

Transport and unload the prefabricated dome materials at the site. The contractor is responsible for the safe unloading and storage of the prefabricated trapezoidal panels. Erect and assemble the dome structure at the site per the approved shop drawings.

Install all carpentry using skilled carpenters working under proper supervision. The work shall be carried out in a thoroughly high grade and workmanlike manner. The framework shall be assembled using 3 ¼-inch galvanized spiral nails or ring shanked nails. All joints shall be tight and present a smooth surface for gluing. Attach the plywood sheathing to the frame using glue. Use 1 ¾-inch galvanized staples to hold the plywood in place while the panel glue cures. The plywood shall then be beveled to suit the framework.

Assembly and erection of prefabricated panels, installation of the doorway trusses, canopy and all related work must be done in accordance to manufacturer's drawings and specifications. Adjustments may be made on site if found to be necessary and shall be carried out in a workmanlike manner conforming to good building practices.

C.3 Reinforcement

Place reinforcement accurately in position as shown on the shop drawings. Securely fasten and support reinforcement to prevent displacement before and during pouring. Cleaning, bending and placing of reinforcement shall be done in accordance to standard spec 505.

C.4 Concrete Wall

C.4.1 General

Install all required footings, foundations, and/or other required substructures or supports at the required elevations on properly prepared subgrade, as required for the erection of the complete storage building.

The contractor is responsible for checking all dimensions and accuracy of the form work and reinforcing steel prior to placing the concrete. Make minor adjustments necessary in the footings and foundation to accomplish a vertical building axis and level horizontal foundation lines. Follow the normal and recommended practice for the placing and protection of the concrete in accordance to standard spec 501.

C.4.2 Formliner

Supply reusable form liner having a smooth, horizontal brick pattern with round joints. Clean the form liner prior to each pour and ensure that it is free of any build-up. Visually inspect each liner for blemishes or tears, and repair if necessary per manufacturer's recommendations.

Place the formliner on the outside wall faces as indicated in the plans. The smooth, horizontal brick pattern shall extend a minimum of 6" below finished grade.

Apply form release agent per manufacturer's recommendations.

Attach liner securely to forms in accordance to manufacturer's recommendations to maintain a continuous smooth, horizontal brick pattern with round joints. Coordinate wall ties with form liner and form manufacturer, e.g., diameter, size, and frequency where applicable.

Grind or fill pouring blemishes.

C.4.3 Concrete Staining

C.4.3.1 Preparation of Concrete Surfaces

Match or exceed the stain manufacturer's minimum recommended curing time of the concrete or 28 days, whichever is greater before applying base color stain.

Prior to staining, make sure all areas to be stained are clean and dry.

C.4.3.2 Staining Concrete Surfaces

Furnish, prepare, apply, cure and store all materials according to product manufacture directions specified for the type and condition of application required.

Apply the stain in strict conformance with product manufacture requirements.

Apply the concrete stain when the temperature of the concrete surface is 45 degrees F or higher, or as specified by the manufacturer.

The final color of the concrete following application of the stain system shall match the fascia brick color for Storage Building 2 and the approved City of Wauwatosa Design Review Board sample.

Do not begin the staining until adjacent operations are completed to a point where this work can begin without receiving damage or blowing dust. Where this work is adjacent to exposed paved areas, provide temporary covering protection from overspray or splatter.

C.4.3.3 Surfaces to be Coated

Apply the concrete stain to the smooth brick face as shown on the plan. Stain only the outside vertical face of the concrete wall. Do not apply stain to the mortar lines and any horizontal surfaces.

C.4.4 Test Panel

At least 15 working days prior to the start of forming the concrete wall, prepare and deliver to the field office a 4-foot by 4-foot concrete test panel. Cast the test panel with the proposed formliner and apply stain using the same materials and in the same method as proposed for the concrete wall. The pattern, final color, and finish shall match the City of Wauwatosa Design Review Board sample and are to be approved by the engineer prior to placement of any concrete or stain in the field.

Additionally, the engineer will evaluate the stain application and color, the adequacy of the product, and the forming methods to yield the desired results. The engineer shall inspect condition of the test panel and its dimensional quality. All voids and irregularities shall be repaired using the same methods as on the final concrete walls. The engineer will evaluate the test panel for definition and consistency. If the test panel is accepted the workmanship becomes the standard for the balance of the contractors work and incorporation into the final concrete walls.

If the test panel is not accepted, the contractor shall prepare another test panel and repeat the process, using either a different product or different methods. This procedure shall be repeated until the test panel is accepted by the engineer.

C.5 Roof

The roof surface shall be smooth and free from defects. The roof surface shall be dry and clean from dirt, rubbish and other foreign materials before the roofing is started. Cover the roof surface with asphalt shingling. All projecting nails shall be set flush to the roofing sheathing.

The roofing shall be installed in strict accordance with the manufacturer's instructions in the conventional manner after the complete building has been erected.

Flashings shall be installed where called for on the approved drawings and shall be a minimum of 0.017-inch aluminum material.

Apply the roofing shingles with large head galvanized roofing nails. The number and location of the nails shall be installed by the manufacturer's directions.

Roof vents and other openings in the roof shall be properly installed in such a manner to prevent leakage.

C.6 Electrical Work

Perform all electrical work per applicable codes. The work shall be inspected and approved by the local building department.

Coordinate the power supply to the Salt Dome. Power shall be placed underground. Place electrical underground conduit prior to commencement of asphalt pad construction. Locate the electrical panel in compliance with proper clearances in all applicable codes on the interior face of the building wall adjacent to the entryway. Install all electrical work as shown on the plans and as specified herein.

The limits of electrical work for the Salt Dome include the interior and extend 5'-0" beyond the face of the building at grade.

C.7 Finishes

Any wood exposed to the elements shall be properly flashed.

C.8 Ventilation

Provide suitable openings located at or near the highest point of the roof to provide a minimum ratio of 1 sq. in. of free air area for each 55 sq. ft. of building floor area.

C.9 Testing

Testing for all materials shall be in accordance to the pertinent section of the standard specifications and performed by the contractor. Provide maintenance and service information for the principal components of the Salt Dome to the Milwaukee County Department of Public Works.

C.10 Warranty Work

Warranty work shall include all proper repairs or corrections made necessary by defective materials or inferior workmanship and does not include normal wear and tear. Contractor shall provide all necessary labor, material and equipment required.

Maintain insurance for performing warranty work as specified in standard spec 107.26 throughout the warranty period.

If warranty work causes damage to the building structures and all associated components, repair or replacement of the damage will be the responsibility of the contractor. Use replacement materials of the same kind specified in the original contract unless mutually agreed otherwise by the Milwaukee County Department of Public Works and the contractor.

All warranty work shall require a permit from the county. The county will provide contact information for obtaining a permit to the contractor.

Document all warranty work performed. Use the department's form DT2305 to provide this information to the county each time work is performed.

C.11 Remedial Work

Remedial work will be based on the result of manual surveys or evaluations. Perform remedial work in the same calendar year that the distresses were recorded. Remedial work to be performed and materials to be used will be the joint decision of the contractor and the engineer.

The contractor will have the first option to perform the remedial work. If, in the opinion of the engineer, the problem requires immediate attention for the safety of the public, and the contractor cannot perform the remedial work within five calendar days of the engineer's written authorization, the engineer may have the remedial work performed by other forces and at the contractor's expense.

Remedial work performed by other forces will not alter the requirements, responsibilities, or obligations of the warranty.

If remedial action work or elective/preventive action work performed by the contractor necessitates a corrective action to other components of the Salt Dome, then such corrective action will be the responsibility of the contractor.

D Measurement

The department will measure Salt Dome completed in accordance to the contract and accepted, as a single complete lump sum unit of work.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0101	Salt Dome	LS

Payment is full compensation for designing the 150-foot diameter salt storage dome, concrete walls, and footings; for furnishing all required submittals and shop drawings; for providing all manuals; for coordinating with the dome loading belt conveyor manufacturer and installer; for fabricating, transporting, unloading, and storing dome materials; for inspections with the local building department; for preparing the foundation; for furnishing and placing all concrete; for furnishing all excavating, bedding, backfilling, and compacting; for furnishing, erecting, and installing all materials including the prefabricated dome structure, lumber, plywood, glue, hardware, reinforcing steel, anchor bolts, metal accessories, foundation, concrete wall, wing walls, roofing, asphalt shingles, roof vents, felt underlayment, vinyl siding, fans, fan dormers, overhead door, safety chains, flashing; for providing and installing all electrical materials and components including service, panel mounting hardware, metering, electrical panel, breakers, outlets, switches, wiring, fixtures, lights, luminaires, bird spikes, conduits, pull boxes, junction boxes, pushbuttons and for making all connections; for providing all coatings; for furnishing all galvanizing; for furnishing formliners and attaching formliners to forms; for forming and pouring test panels; for delivery of test panels to site; for producing the

proposed smooth brick pattern surface treatment; for finishing and protecting the surface treatment; for concrete sealing; for properly disposing of surplus material and test panels; for furnishing and applying concrete stain; for preparing the concrete surface; for testing all necessary items; for obtaining all necessary permits; for furnishing all review and permit fees and any associated inspection costs; for obtaining Department of Commerce approval; for control of water; for furnishing all remedial work; for the warranty and warranty bond; for performing warranty work.

93. Storage Building 1, Item SPV.0105.0102; Storage Building 2, Item SPV.0105.0103; Salt Brine Building, Item SPV.0105.0104; Bins, Item SPV.0105.0105.

A Description

A.1 General

This special provision describes furnishing, constructing and installing building structures at the Milwaukee County Department of Public Works maintenance yard with reinforced concrete, precast concrete hollow core planks, concrete masonry units, steel joists and beams, metal siding and ceiling, roofing, mechanical and HVAC, plumbing, insulation, eaves and gutters, downspouts, sectional overhead doors, service doors, windows, frames and appurtenances as shown on the plans; furnishing and constructing the reinforced concrete building foundations and walls; excavating and backfilling in accordance to standard spec 206; proportioning, mixing, placing, and protecting concrete in accordance to standard spec 501; furnishing and placing reinforcement in accordance to standard spec 505; and as specified herein.

The roof is defined as the metal roof panels with rake trim and floating ridge, eave with gutter, and downspouts that comprise Storage Building 1 and Storage Building 2. The roof is also defined as the precast concrete hollow core planks with insulation, 60 mil rubber membrane, and fascia that comprise the Salt Brine Building. Provide a three year warranty on all roofing. (One year performance bond plus two year warranty bond.) Include labor and materials in the warranty.

Eight-inch diameter guard posts and bollards are not included in these bid items and will be paid for under a separate bid item.

Except gas unit heaters, electric unit heaters, electric water heaters, overhead door openers, and fans; all other electrical equipment and appurtenances on or within the building structures are not included in these bid items and will be paid for under the Common Electrical Work bid items.

A.1.1 Storage Building 1

The building structure shall be rectangular-shaped with exterior dimensions measuring 140 feet in length, 60 feet in width, and 24 feet-10 inches in height from finished grade including roofing materials as shown on the plans. The exterior walls shall consist of 12-inch concrete masonry units with reinforcement and metal siding above 12-inch thick

reinforced concrete walls with formliner measuring 12 feet in height from finished floor as shown on the plans and specified herein.

Interior walls shall consist of 12-inch thick reinforced concrete measuring 12 feet in height from finished floor and dividing the structure into eight sections. The concrete floor shall consist of 7-inch thick reinforced concrete slabs as shown on the plans.

Roofing for Storage Building 1 shall consist of steel joists, metal roof panels with rake trim and floating ridge, eave with gutter, and downspouts as shown on the plans and specified herein.

The structure shall include two exterior service doors on the west side of the building, two exterior service doors on the east side of the building, and eight sectional overhead doors each with 30-foot wide by 18-foot tall openings. Exterior service doors shall include a 4-foot by 6-foot door stoop with reinforced concrete footings outside the structure as shown on the plans.

A.1.2 Storage Building 2

Storage Building 2 shall include four shelter sections on the north end of the structure; eight storage sections in the center of the structure; and a heated carpenter room, a water distribution room, and an electrical room on the south end of the structure. The building structure shall be rectangular-shaped with exterior dimensions measuring 490 feet in length, 40 feet in width, and 24 feet in height from finished grade including roofing materials as shown on the plans.

The exterior walls for the heated carpenter room, water distribution room, and electrical room shall consist of 12-inch concrete masonry units with reinforcement, 2-inch rigid insulation, 4-inch concrete masonry units, fascia brick, and metal siding as shown on the plans and specified herein. The remaining exterior walls shall consist of 12-inch concrete masonry units with reinforcement and metal siding above 12-inch thick reinforced concrete walls with formliner measuring 8 feet in height from finished floor as shown on the plans and specified herein.

The interior walls separating the heated carpenter room from the water distribution room and the electrical room shall consist of 8-inch concrete masonry units with reinforcement measuring 10 feet in height from finished floor. The ceiling for the water distribution room and the electrical room shall consist of 8-inch thick precast concrete hollow core planks as shown on the plans.

The interior walls separating the heated carpenter room from the storage sections of the building structure shall consist of 12-inch concrete masonry units with reinforcement and insulation measuring 22 feet in height from finished floor.

Interior walls separating the storage sections shall consist of 12-inch concrete masonry units with reinforcement above 12-inch thick reinforced concrete walls measuring 8 feet in height from finished floor.

Roofing for Storage Building 2 shall consist of steel joints, metal roof panels with rake trim and floating ridge, eave with gutter, and downspouts as shown on the plans and specified herein.

The concrete floor shall consist of 7-inch thick reinforced concrete slabs as shown on the plans.

The structure shall include five exterior service doors, eight single interior service doors, one double interior service door, eight sectional overhead doors each with 20-foot wide by 18-foot tall openings, and one sectional overhead door with a 14-foot wide by 12-foot tall opening. Overhead door and shelter openings are all to be located on the west side of the structure. Exterior service doors shall include a 4-foot by 6-foot door stoop with reinforced concrete footings outside the structure as shown on the plans.

The heated carpenter room shall include one 3-foot wide by 4-foot tall window on the west side of the building, two 60-inch diameter ceiling fans, a shop sink, an eye wash station, and two floor drains. The ceiling for the heated carpenter room shall consist of a metal ceiling panels with R36 fiberglass insulation as shown on the plans.

The water distribution room shall include one floor drain.

Concrete splash pads measuring three feet in length and one-foot in width shall be included for all downspouts on the east side of the building structure.

A.1.3 Salt Brine Building

Salt Brine Building shall include a brine room, an electrical room, a water meter room, and a storage tank equipment pad located south of the building. The brine room shall be rectangular-shaped with exterior dimensions measuring 36 feet in length, 24 feet-8 inches in width, and 22 feet in height from finished floor not including the roofing materials as shown on the plans. The electrical room shall be rectangular-shaped with exterior dimensions measuring 8 feet in length, 16 feet in width, and a minimum of 10 feet in height from finished grade not including roofing materials as shown on the plans. The water meter room shall be rectangular-shaped with exterior dimensions measuring 8 feet in length, 9 feet-4 inches in width, and a minimum of 10 feet in height from finished grade not including roofing materials as shown on the plans.

The storage tank equipment pad shall consist of reinforced concrete slab and shall be rectangular-shaped with exterior dimensions measuring 46 feet in length, 33 feet in width, and 2 feet in thickness with 12-inch border having a total depth of 3 feet-6 inches not including structural fill as shown on the plans. Six 4-inch concrete tank pads with a 12-foot diameter shall be included above the reinforced concrete slab as shown on the plans.

Storage containment tanks, brine maker and loading pad hopper are not included in this bid item and will be furnished and installed by others.

The walls for the brine room shall consist of 12-inch concrete masonry units with reinforcement and insulation, and the exterior walls for the electrical room and the water meter room shall consist of 8-inch concrete masonry units with reinforcement and insulation as shown on the plans and specified herein.

Roofing for the brine room, the electrical room, and the water meter room shall consist of precast concrete hollow core planks with insulation, 60 mil rubber membrane, and fascia.

The concrete floor inside the brine room, the electrical room, and the water meter room shall consist of 8-inch thick reinforced concrete slabs as shown on the plans.

The structure shall include one exterior service door on the north side of the brine room, one exterior service door on the east side of the electrical room, one exterior service door on the east side of the water meter room, and one sectional overhead door with a 16-foot wide by 18-foot tall opening located on the north side of the brine room. All service doors shall include a 4-foot by 6-foot door stoop with reinforced concrete footings outside the structure as shown on the plans.

The brine room shall include one trench measuring 9 feet in length, 12 inches in width, and 6 inches in depth with a 14-inch wide and 1/4-inch thick diamond plate stainless steel trench cover and appurtenances as shown on the plans; one 6-foot diameter manhole having a depth of 6 feet and the brine room's flooring sloped to its frame and grate; and two roof drains. Furnish a 4-inch schedule 80 PVC carrier pipe with two 45 degree elbows at each end as shown on the plans for a connection between the brine room and the spray bar.

A.1.4 Bins

The building structure shall be rectangular-shaped measuring 151 feet in length, 60 feet in width, and varying in height from 8 feet to 10 feet from finished grade as shown on the plans. The walls shall consist of 12-inch thick reinforced concrete dividing the structure into 12 sections each measuring 24 feet in length and 29 feet-6 inches in depth between the walls as shown on the plans and specified herein. The concrete floor shall consist of 16-inch thick reinforced concrete as shown on the plans.

A.2 Quality Assurance

Building Contractor:

The building contractor shall be regularly engaged in the assembly, construction, and erection of structures required for this project. The building contractor shall have at least five years of successful experience in providing construction of the type of structures required for this project.

Materials:

Provide materials as indicated on the plans and meeting this specification. The contractor is responsible for all products, components, accessories, and methods used in constructing the building.

The current code standard requirements of the following organizations for material quality, fabrication, and installation procedures shall be met or exceeded, for applicable methods employed in the building design:

- American Institute of Steel Construction (AISC)
- American Concrete Institute (ACI)
- American Iron and Steel Institute (AISI)
- Precast/Prestressed Concrete Institute (PCI)
- ASTM International (ASTM)

A Certificate of Compliance may be furnished for materials specified to a recognized standard or code in accordance to standard spec 106.3.3.

A.3 Submittals

Furnish the following information as proof of conformity to design and performance criteria requirements of this specification. All submittals shall be stamped and signed by a professional engineer licensed to practice in the State of Wisconsin.

In the case of prefabricated buildings and proprietary design, submit stamped plans by a professional engineer licensed to practice in the State of Wisconsin certifying that the prefabricated building design, materials, and fabrication meet this specification.

Provide all pertinent shop drawings, structural design information and submittals to the engineer prior to ordering and installing any materials required for the work. The engineer must approve all materials and submittals prior to the contractor ordering and installing any materials required for the work. The required shop drawings include, but are not limited to:

- Letter of Design Certification, signed and sealed by a professional engineer licensed to practice in the State of Wisconsin including the following:
 - Name and location of the project
 - Order number
 - Name of manufacturer
 - Name of contractor
 - Building dimensions including diameter, height, and roof slope
 - Governing building code and year of edition
 - Shop Drawings: For building structure components (include plans, elevations, sections, details, and attachments to other work) including:
 - Concrete footings and foundations
 - Steel reinforcement
 - Steel joists and beams
 - Metal siding, ceiling and roofing
 - Gutters and downspouts
 - Metal plates and fasteners
 - Wall systems

- Insulation
- Flashings
- Barrier walls
- Concrete masonry units
- Brick
- Windows
- Doors and frames
- Overhead doors
- Fans
- Moisture and vapor barriers
- Site work and excavation
- Sealing and fire stopping
- Gas unit heaters, electric unit heaters, and electric water heaters
- Pipe and fittings (mechanical and plumbing)
- Branch takeoffs
- Valves (ball, drain, butterfly, check, and gate)
- Thermometers, press gauges, and strainers
- Hangers and supports (mechanical and plumbing)
- Plumbing specialties (floor and roof drains, trap guards, hub drains, cleanouts, water hammer arrestors, backflow preventers, manholes and castings, shop sink, and eye wash station)
- Plumbing fixtures and equipment
- Hardware
- Accessories
- Warranties

A.4 Building Permits

Department of Commerce approval has been obtained by the department. Building permits shall be obtained by the contractor.

A.5 Testing, Operation, and Training

Testing for materials shall be in accordance to the pertinent section of the standard specifications and performed by the contractor. Provide a complete manual containing installation, operation, maintenance, lubrication requirements, and service information for each component of mechanical and electrical equipment or systems to the engineer.

Each operation and maintenance (O&M) manual shall include, but not be limited to, the following:

- Diagrams and illustrations
- Detailed description of the function of each principal component of the system
- Performance and nameplate data
- Installation instructions
- Procedure for starting
- Proper adjustment
- Test procedures

- Operating procedure
- Shutdown instructions
- Emergency operating instructions and troubleshooting guide
- Equipment use Safety precautions
- Bill of material/parts list
- List of electrical relay settings, control and alarm contact settings
- Electrical interconnection wiring diagram for equipment furnished including all control and lighting systems

Maintenance and overhaul instructions shall include detailed assembly drawings with part numbers, parts list, instructions for ordering spare parts, and complete preventive maintenance instructions required to assure satisfactory performance and longevity of the equipment.

Lubrication instructions shall list parts with diagrams, exhibits, and pictures of equipment to be greased or oiled; shall recommend type, grade, and temperature range of lubricants; and shall recommend frequency of lubrication.

The O&M manual submittal shall be bound with a binder clip and placed in an expansion type manila file pocket. Each file pocket shall be clearly labeled with the equipment description and tag number. The file pockets shall be submitted to the engineer in similarly labeled expanding wallets with ties.

Whenever possible, material shall be 8-1/2 inches by 11 inches or 11 inches by 17 inches z-folded to 8-1/2 inches by 11 inches. If necessary, materials larger than 11 inches by 17 inches may be provided. They shall be folded to approximately 8-1/2 inches by 11 inches so that the title block is clearly visible without unfolding. Provide an electronic copy of the drawing in an Autocad or Microstation form. Items not available as a vector drawing shall be provide in PDF format.

All material shall be tailored to the specific function that the equipment serves in the facility. If material covers more than one product type or includes equipment information not relevant to the project, the applicable information for the equipment supplied shall be clearly indicated by highlighting the information using a yellow felt tip marker manufactured for that purpose. Highlighting that obliterates the information when photocopied is not acceptable. The relevant information shall also be indicated by an arrow located in the margin. If catalog cuts are included in the submittal, the catalog name and number, and the company name, address and telephone number shall be provided on the catalog cut or typewritten on a separate sheet of paper.

Provide training to the Milwaukee County Department of Public Works regarding proper operation and maintenance of all equipment. One training session is required at the site. Contact Mr. Dan Goeden at (414) 257-6585 to coordinate the training. Demonstrate startup and shutdown procedures for all equipment. All training shall be conducted during normal working hours.

A.6 Warranty and Warranty Bond

The required warranty period for the roofing on each roofed structure, as described in Section A.1, shall be a minimum of three years after final acceptance of each building structure and roof. (One year performance bond plus two year warranty bond.)

The bonding company must have an A.M. Best rating of “A-“or better and the contractor shall provide proof of a 2-year bond commitment before execution of the contract. The Milwaukee County Department of Public Works shall be named as obligee on the warranty bond.

The warranty bond shall be \$50,000 for each warranted roof. The bond will insure the proper and prompt completion of any required warranty work for the duration of the warranty period, including payments for furnishing all labor, equipment and materials used according to this specification as prescribed in Section C.17 Warranty Work.

If a subcontractor places the warranted roofing, the subcontractor may provide a dual obligee bond naming the contractor and the Milwaukee County Department of Public Works as obligees.

Failure of the contractor, subcontractor or its surety to issue or renew the warranty bond will be considered a default and will result in forfeiture of the face amount of the bond to the Milwaukee County Department of Public Works.

Perform or commence all warranty work within 15 calendar days of the engineer’s written authorization

All warranty work will be as prescribed in Section C.17 Warranty Work of this article. At the end of the warranty period, the contractor will be relieved of the responsibility to perform further warranty work, provided all previous warranty work has been completed.

Maintain insurance, in the course of performing warranty work, as specified in standard spec 107.26 throughout the three year warranty period. (One year performance bond plus two year warranty bond.)

A.7 Code Compliance

Build each structure in conformance with all applicable codes.

B Materials

B.1 General

Furnish Storage Building 1, Storage Building 2, Salt Brine Building, and Bins as described in Section A.1 with appurtenances as shown on the plans and as specified herein.

B.2 Excavation

B.2.1 Foundation Excavation

Furnish Backfill Granular in accordance to the pertinent requirements of standard spec 209 for use as backfill material at locations shown on the plans.

B.2.2 Slab Excavation

Furnish 6 inches of ¾-inch clear stone conforming to Course Aggregate Size No. 1 as shown on the plans and in accordance to section 8.33.3 of the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments for use as backfill material under a 6 mil polyethylene film moisture barrier of natural color with a laboratory tested vapor transmission rating at 0.2 perms.

Slab excavation for Bins and the storage tank equipment pad at the Salt Brine Building shall be backfilled as shown on the plans with structural fill conforming to Base Aggregate Dense ¾-inch in accordance to standard spec 305.

B.3 Structural

B.3.1 Reinforcing Steel

For cast in place concrete, furnish steel reinforcing bars conforming to standard spec 505.

B.3.2 Structural Steel

Furnish all materials and incidentals necessary to install structural steel including bearing plates, columns, joists, beams, lintels, and miscellaneous shapes and plates required to erect the structural framing as shown on the plans and specified herein.

Furnish structural steel conforming to the following requirements:

- Structural shapes, plates and bars unless otherwise noted or shown shall be ASTM A-50.
- Structural steel pipe shall be ASTM A501 or ASTM A53, Type E or S.
- Welding rods shall be according to AWS Specification for mild Steel Covered Arc-Welding Electrodes, A5.1.
- Galvanizing shall be according to ASTM A-123.
- High strength steel bolts shall be ASTM Specification A-325 or A490. Furnish a copy of the manufacturer's inspection test report with the result to the engineer.
- Anchor Bolts shall be ASTM A307 or A36.

All exposed structural steel specified on the plans shall be painted in accordance to Section B.5.5 Paint after shop fabrication.

B.3.3 Anchors and Fasteners

Furnish anchors and fasteners conforming to the following requirements:

- Hooked anchor bolts: Type 304 or type 316
- Expansion: Type 303 or type 316
- Fasteners: Type 303, type 304, or type 316

Acceptable manufacturers of expansion bolts are as follows:

- Hilti Kwik Bolt
- ITW Ramset/Red Head Trubolt Wedge Anchors
- Powers Fastening Co., Power Bolt
- Or approved equal

B.3.4 Metal Accessories

Furnish all spacers, chairs, ties and other devices necessary for the proper spacing, supporting and fastening of the reinforcing steel in place.

B.4 Concrete

B.4.1 Cast in Place

Proportion, mix, and furnish concrete in accordance to standard spec 501.

B.4.2 Precast Concrete Hollow Core Planks

B.4.2.1 Fabrication and Design

Design shall be in accordance to the PCI Manual for the Design of Hollow Core Slabs, latest edition. The concrete minimum compressive strength shall be 4000 PSI at 28 days.

Pretension prestress strands by either a dead weight system or a single strand jacking system. Mark strands for slippage. If slippage occurs, detension strand and restress. Check tension of strands to insure accurate results.

Detension prestress strands when concrete reaches a strength of 3,000 PSI or greater as required by design.

Install weld angles, anchor inserts and other required embedded items straight and as shown on approved shop drawings. Verify that structural and anchorage inserts are within allowable tolerances.

Wet or steam cure precast concrete hollow core planks. Make clean, smooth and straight without fins, broken edges or structural defects before delivery.

Precast concrete hollow core planks shall conform to the following fabrication tolerances:

- Length: plus or minus ½ inch of length indicated on approved shop drawing
- Width: plus or minus ¼ inch
- Thickness: plus or minus 1/8 inch
- Differential camber between adjacent units of the same design: ¼ inch per 10 feet
- Locations of inserts within planks: plus or minus 1 inch

Concrete mix design shall be in accordance to the latest edition of ACI Committee 211 with reference to ACI Subcommittee 2 report Recommended Practice for Selecting Proportions for No-Slump Concrete. Measurements for concrete mix shall be within the following limits:

- Cement: plus or minus 1 percent
- Water: plus or minus 1 percent
- Fine aggregate: plus or minus 2 percent
- Course aggregate: plus or minus 2 percent
- Admixtures: plus or minus 3 percent
- Grout: Normal, minimum 10,000 PSI 28-day strength

Manufacturer shall take cylinder tests per ASTM C 192, for each mix design, for each day of production, or for each 100 cubic yards of concrete.

B.4.2.2 Precast Concrete Components

Furnish the following components for the precast hollow core planks:

- Hollow core plank: 48-inch wide units with pretensioned prestress strands
- Beam for opening 1-101B
- Grout: Non-Shrink, minimum 28-day strength: 2,500 PSI.
- Strand: Uncoated 7-wire strand conforming to ASTM A 416, including supplement. Grade 250 or 270
- Anchors, inserts, lip angles, etc: Galvanized steel, ASTM A123
- Headers and bearing angles: Galvanized steel, ASTM A123
- Bearing pads: Multi-monomer plastic strips
- Joint treatments:
 - Foam backer rods: Expandable, flexible type as recommended by precast manufacturer
 - Interior joint sealant: Polyurethane conforming to Caulk section of this article
- Portland Cement: ASTM C-150, gray Type I or III
- Aggregate:
 - Normal weight: ASTM C 33, for fine to coarse gradation
 - Light weight: ASTM C 330, for fine to coarse gradation
- Admixtures:
 - Air-entraining admixtures: ASTM C 260
 - Chemicals: conform to ASTM C 494
 - Calcium chloride: not permitted
- Water: Potable

B.4.3 Concrete Masonry Units

B.4.3.1 General

Furnish materials complying with ACI 530.1/ASCE 6 "Specifications for Masonry Structures," except as otherwise indicated. Revise ACI 530.1/ASCE 6 to exclude Sections 1.4 and 1.7; Parts 2.1.2, 3.1.2, and 4.1.2; and Articles 1.5.1.2, 1.5.1.3, 2.1.1.1, 2.1.1.2, and 2.3.3.9; and modify Article 2.1.1.4 by deleting requirement for installing vent pipes and conduits built into masonry.

Where fire-resistance ratings are indicated for unit masonry work, provide materials and construction which are identical to those of assemblies whose fire endurance has been determined by testing in compliance with ASTM E-119 by a recognized testing and inspecting organization.

Furnish exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.

Furnish standard concrete masonry units with size dimensions of 16 inches long x 8 inches high x 4 inches wide with a normal weight unless otherwise indicated (125 lbs per cubic foot or more, oven dry weight of concrete). Furnish special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions. Provide bullnose units for windowsills and door openings unless otherwise indicated.

B.4.3.2 Mortar and Grout

Furnish mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

Mortar and grouter materials shall conform to the following requirements:

- Portland Cement: ASTM C-150, Type II, or I except III may be used for cold weather construction. Provide colored mortar to match existing.
- Exterior above grade mortar shall have Best-Tuff water repellent added.
- Masonry Cement: Not permitted.
- Hydrated Lime: ASTM C-207, Type S.
- Aggregate for Mortar: ASTM C-144, except for joints less than 1/4" use aggregate graded with 100% passing the No. 17 sieve. Provide from single source.
- Aggregate for Grout: ASTM C-404.
- Water: Clean, potable, and free of amounts of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to mortar or any metal in the wall.
- Do not lower the freezing point of mortar by use of admixtures or anti-freeze agents.
 - Do not use calcium chloride in mortar or grout.
- Mortar for Unit Masonry: Comply with ASTM C-270, Proportion Specifications for types of mortar required.
 - Type M: 1/4 part lime per part of portland cement. Use Type M for masonry below grade and in contact with earth.
 - Type S: Over 1/4 up to 1/2 part lime per part of portland cement. Use for all masonry except for masonry in contact with earth.
 - Grout for Masonry: Comply with ASTM C-476.

B.4.3.3 Masonry Accessories

Furnish the following masonry accessories:

- Horizontal Joint Reinforcing and Ties for Masonry
- Welded wire units prefabricated in straight lengths of not less than 10', with matching corner ("L") and intersection ("T") units. Fabricate from cold-drawn steel wire complying with ASTM A-82, with deformed continuous side rods and plain cross rods, into units with widths of approximately 2" less than nominal width of walls and partitions as required to position side rods for full embedment in mortar with mortar coverage of not less than 5/8" on joint faces exposed to exterior and not less than 1/2" elsewhere. Provide the following type of joint reinforcing unless otherwise indicated.

- For single-wythe masonry, provide truss type design with continuous diagonal cross rods spaced not more than 16" o/c.
 - For multi-wythe masonry, provide ladder type design with perpendicular cross rods spaced not more than 16" o/c.
- Number of Side Rods: Single pair for single wythe masonry and as indicated for multi-wythe masonry, or if not otherwise indicated, one side rod for each brick wythe and one side rod for each face shell of each concrete masonry wythe.
- Wire Size: Fabricate with 9-gauge side and cross rods.
- Wire Finish: Provide manufacturer's standard mill galvanized finish.
- For exterior and below grade walls, fabricate from steel wire with mill galvanized finish with 0.80 zinc coating ASTM A-641, Class 3.
- Reinforcing Bars: Deformed steel, ASTM A-615, Grade 360, of the sizes shown.
- Non-Metallic Expansion Joint Strips: Provide premolded, compressible, elastic fillers of foam rubber or neoprene.
- Bond Breaker Strips: 15-lb. asphalt roofing felt complying with ASTM D-226.
- Fill all masonry block cores in outside walls with expanded polystyrene bead insulation.

B.4.3.4 Flashings for Masonry

Furnish concealed flashings, shown to be built into masonry. Thru-wall flashings shall consist of virgin polyvinyl chloride with plasticizers and other modifiers, formed into uniform flexible sheets not less than 20-mils thick and black in color, unless otherwise indicated.

B.4.4 Clear Sealer

Furnish a silicate blend water-based concrete sealer. The concrete sealer shall be clear liquid when applied, dry invisible, and leave the aesthetic appearance of the substrate unchanged. The clear sealer shall conform to the following requirements:

- Weight per gallon: 8.25 lb/gal to 8.45 lb/gal
- Active ingredient: Silicate Blend
- Active content: 9%
- pH: 11 to 12
- Volatile organic: 0 lbs/gal
- Flash point – SETA: >210° F
- Solubility in water: Soluble
- Appearance: Clear liquid

B.4.5 Formliner

Use reusable form liners that are made of highway strength urethane or lightweight one time use elastomeric foam form liners that attach easily to the forming system, and do not compress more than 1/4-inch when poured at a rate of 10 vertical feet/hour.

Formliner shall have a smooth, horizontal brick pattern with round joints. Individual bricks shall be rectangular in shape separated by ½-inch wide horizontal and vertical mortar lines. Individual brick dimensions shall have a length of 7 ½-inches and a height of 2 ½-inches. Relief of the formliner shall be ¼-inches.

Use a release agent that is compatible with the form liner and coloring materials.

Wall ties shall have set "break-backs" at a minimum of ¾-inches from the finished concrete surface.

B.4.6 Concrete Staining

Use concrete stain manufactured for use on exterior concrete surfaces at locations shown on the plans for Storage Building 1 and Storage Building 2. Use the following products, or equal as approved by the engineer, as part of the finish system:

Tri-Sheen Acrylic by TK Products
TK-5272 Tri-Sheen Pigmented Stain
B-97-200 Series Concrete Stain by Sherwin Williams
(*Natural Look)

B.5 Building Materials

B.5.1 General

Furnish all materials and equipment as shown on the plans and specified herein.

B.5.2 Fascia Brick

Furnish modular size brick conforming to ASTM C216, Grade SW, Type FBX. The bricks shall be rectangular in shape and manufactured to the following actual dimensions: 3-5/8 inches x 2-1/4 inches x 7-5/8 inches. Acceptable manufacturers include Champion Companies of Wisconsin, Red Matt, or approved equal.

The color of the fascia brick shall match the City of Wauwatosa Design Review Board samples and are to be approved by the engineer prior to ordering materials. At least 15 working days prior to the start of work, supply a sample of 10 bricks for approval by the engineer.

Furnish mortar and grout materials in accordance with Section B.4.3 Concrete Masonry Units.

B.5.3 Insulation

B.5.3.1 Definitions

Thermal Resistivity: Where the thermal resistivity of insulation products are designed by "r-values," they represent the reciprocal of thermal conductivity (k-values). Thermal conductivity is the rate of heat flow through a homogenous material exactly 1" thick. Thermal resistivities are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

B.5.3.2 General

Furnish material conforming to the following requirements at locations shown on the plans:

- Foundation Wall Insulation: Provide rigid cellular thermal insulation complying with ASTM C-578, Type 1, 0.90 pcf minimum density, aged R-value of 4.00 and 3.60 at 40 degrees F and 75 degrees F respectively. Provide 2" thickness unless otherwise indicated on drawings.
- Mineral/Glass Fiber Blanket/Batt Insulation: Glass or other inorganic fibers, formed into flexible, resilient blankets or semi-rigid sheets; complying with FS HH-I-521; type as indicated; density as indicated, but not less than 1.0 lb. per cu. ft.; approximate thermal conductivity (K-value at 75 degrees F) of 0.27; thickness as indicated; manufacturer's standard lengths and widths, as needed to coordinate with structural elements of spaces to be insulated.
 - Type 1: Units without facing or membrane. Provide semi-rigid units where required for self-support by friction fit.
- Auxiliary Insulating Materials:
 - Polyethylene Vapor Retarder: Provide 6 mil polyethylene film, with laboratory tested vapor transmission rating at 0.2 perms, natural color.
 - Tape for Vapor Retarder: Pressure sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder.

B.5.3.3 Board Insulation

Furnish materials that provide a continuous thermal barrier at building enclosure elements meeting the following requirements:

- Insulation: Type A: FS HH-I-524, Type 4, for all installation; extruded cellular polystyrene; square edges, board size of thickness as indicated. Thermal resistance "R" per 1 inch of 5.0 min.
- Adhesive Materials: Type 1: Type recommended by insulation manufacturer for application.

B.5.3.4 Foamed in Place Masonry Insulation

Furnish two component thermal insulation produced by combining a plastic resin and catalyst foaming agent surfactant which, when properly ratioed and mixed together with compressed air, produce a cold-setting foam insulation with the following properties:

- Fire-resistance: Minimum 4 hour fire resistance wall rating (ASTM E-119) for concrete masonry units when used in standard 2 hour rated CMUs.
- Surface burning characteristics:
 - Flame spread: 5
 - Smoke developed: 50 – 100
 - Fuel contributed: 0
- R-Value: Minimum 4.5 per inch at 35 degrees F mean (ASTM C-177)
- Shrinkage: Less than 2 percent
- Dry density: 0.7 pounds per cubic foot

B.5.4 Hardware

Furnish items as listed in the following schedules, complete to function as intended.

- Hardware Set #1
 - 1-1/2 pr. Hinges BB1191 4-1/2 x 4-1/2 x NRP x US32D
 - Lockset supplied by owner installed by contractor
 - Closers 4111N CUSH HO x AL
 - Weather-strip 130SS
 - Sweep 200SSS
 - OH STOP/HO10-346 x 630
 - Threshold 612SS Cutting and Coping in Field
 - Latch Guard Rockwood 320

- Hardware Set #2
 - 1-1/2 pr. Hinges BB1191 4-1/2 x 4-1/2 x NRP x US32D
 - Lockset L9080L x 06A x 630 (Note master keyway)
 - Closers 4111N CUSH HO x AL
 - Weather-strip 130SS
 - Sweep 200SSS
 - OH STOP/HO10-346 x 630
 - Threshold 612SS Cutting and Coping in Field
 - Latch Guard Rockwood 320

- Hardware Set #3
 - 3 pr. Hinges BB1191 4-1/2 x 4-1/2 x US32D
 - Lockset L9080L x 06A x 630 (Note master keyway)
 - Closers 4111N CUSH HO x AL
 - Weather-strip 130SS
 - Sweep 200SSS
 - OH STOP/HO10-346 x 630
 - Threshold 612SS Cutting and Coping in Field
 - Latch Guard Rockwood 320
 - 1 pr. Surface Bolts 8" – 630 x 630
 - 1 Astragal by Door Supplier
 - 1-1/2 pr. Hinges BB1191 4-1/2 x 4-1/2 x NRP x US32D
 - Exit Device 98L x US32D (Note keyway)
 - Closer 4111N CUSH HO x AL
 - Sweep 200SSS
 - Threshold 612SS Cutting and Coping in Field
 - Weather-strip 130SSS
 - Latch Guard Rockwod 320

Door locks and keys to be furnished by the Milwaukee County Department of Public Works. Contact Mr. Dan Goeden, (414) 257-6585, at least 15 working days prior to the start of door installation to coordinate the supply of door locks and keys.

B.5.5 Paint

Furnish paint, varnish, stain enamel, lacquer and fillers manufactured by PPG, Sherwin-Williams, Tnemec, or equal as approved by the engineer. Supply high quality paint accessory materials approved by the manufacturer such as linseed oil, shellac, turpentine and other materials not specifically indicated herein but required to achieve the finishes specified.

Paints shall be ready-mixed except field catalyzed coatings. Pigments shall be fully ground maintaining a soft paste consistency, capable of being readily and uniformly dispersed to a complete homogeneous mixture. Paints shall have good flowing and brushing properties and be capable of dry or curing free of streaks or sags.

Coatings shall be applied according to the following finishing schedule:

- Ferrous metals interior and exterior, excluding interior wellhead piping
 - 1 coat – S-W Kem Bond HS Universal Metal Primer B50Z series at 2.0 – 5.0 mils DFT.
 - 2 coats – S-W Industrial Enamel HS B54 Z series at 2.0 – 4.0 mils DFT per coat.
- Concrete Walls, interior
 - 1 coat – S-W PrepRite Masonry Primer B28W300 at minimum 3 mils DFT.
 - 2 coats – S-W Pro Industrial Waterbased Epoxy Eg-Shel K45 series at minimum 1.5 mils DFT per coat.
- Concrete Masonry Units, interior and exterior
 - 1 coat – S-W Heavy Duty Blockfiller B42W46 at 10 –18 mils DFT (calculated).
 - 2 coats – S-W Pro Industrial Waterbased Epoxy Eg-Shel K45 series at minimum 1.5 mils DFT per coat.
- Aluminum and Galvanized metals, interior and exterior
 - 2 coats META Latex B42 series at 3.0 to 4.0 mils.

The color of the paint shall match the City of Wauwatosa Design Review Board samples and are to be approved by the engineer prior to ordering materials. At least 15 working days prior to the start of work, supply paint chip samples of each color for approval by the engineer.

The lower 10 feet of the Salt Brine Building exterior walls shall be painted to match the color of the fascia brick on Storage Building 2, and the upper 12 feet of the Salt Brine Building exterior walls shall be painted to match metal siding on Storage Building 1 and Storage Building 2.

B.5.6 Caulk

All caulk products shall have minimum 20-year manufacturer's warranty. Before the building structures are accepted by the department, replace sealants which fail because of loss of cohesion or adhesion, or do not cure.

B.5.6.1 Sealant Materials

Furnish the following materials:

- Sealant: Silicone base, single component, chemical curing; conforming to requirements of FS TT-S-1543, Class A; Shore A hardness of maximum 50; non-staining; color as selected.
- One-Component DyMonic Sealant: Polyurethane based, one-part elastomeric sealant, complying with FS TT-S-230C.
- Multi-Component Polyurethane Sealant: Polyurethane based, multi-compound chemically cured elastomeric sealant, complying with FS TT-S-00227E, Class A, Type I (self-leveling).
- Three-Component Epoxidized Polyurethane Sealant: Three-component epoxidized polyurethane sealant, conforming to ASTM C-920-86, Type M, Grade NS, Class 25 and US Federal Specification TT-S-00227-E, Class A, Type II.

B.5.6.2 Accessories

Furnish the following materials:

- Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- Joint filler: ASTM D1056; round, closed cell polyethylene foam rod; oversized 30 to 50 percent.
- Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

B.6 Metal Siding and Ceiling

Furnish factory-formed metal siding, wall and ceiling panels including fascia, soffit and liner panels for horizontal and vertical installation carrying a minimum manufacturer's non-prorated warranty of 25 years. Obtain metal panel products from a single manufacturer.

Furnish a siding system conforming to the following performance requirements:

- Air Infiltration: Maximum 0.011 cfm/lf of seam at static pressure of +/-6.24 psf when tested per ASTM E1680.
- Water Penetration: No uncontrolled water penetration through the panel joints at a static pressure of 12.0 psf when tested in accordance with ASTM E1646.
- Color Change and Fade Resistance: No cracking, peeling, blistering or loss of adhesion when tested in accordance with ASTM G23; color change, after removal of surface deposits such as dirt or chalk, maximum 5 Δ Hunter units.
- Humidity Resistance: No blistering, peeling or loss of adhesion, after 2000 hours testing in accordance with ASTM D2247.

Manufactured metal siding panels shall conform to the following requirements:

- Profile: Major longitudinal ribs 1 3/16" deep, spaced 12" on center; minor longitudinal ribs centered between major ribs, spaced 3" on center panel; normal-run where ribs protrude from panel plane, viewed from exterior, reverse-run where ribs recede from panel plane, viewed from exterior.
- Size: 36" cover width, lengths indicated on the plans.
- Material: Galvalume Sheet Steel conforming to ASTM A792; AZ55 coating for bare; AZ50 coating for painted; 24 gauge sheet thickness.
- Finish: Polyvinylidene fluoride color coat, minimum 70% polyvinylidene fluoride resin content, applied to sight-exposed face of sheet after pretreatment and priming in accordance with coating manufacturer's recommendations.

Manufactured metal ceiling panels shall conform to the following requirements:

- Profile: Major longitudinal ribs 3/4" deep, spaced 9" on center; minor longitudinal ribs centered between major ribs.
- Size: 36" cover width, lengths indicated on the plans.
- Material: Galvalume steel sheet conforming to ASTM A792, AZ55 coating for bare; AZ50 coating for painted; 26 gauge sheet thickness.
- Finish: Polyvinylidene fluoride color coat, minimum 70% polyvinylidene fluoride resin content, applied to sight-exposed face of sheet after pretreatment and priming in accordance with coating manufacturer's recommendations.

Furnish the manufacturer's standard sheet metal trim matching panel material and finish, break-formed to profiles indicated on the plans, and including, but not limited to copings, gutters and downspouts, and termination and transition strips.

Supply galvanized clips and fasteners required for installation of panels in accordance with manufacturer's installation instructions and other indicated items.

The finish color, texture, and pattern of the metal panels shall match the City of Wauwatosa Design Review Board samples and are to be approved by the engineer prior to ordering materials. At least 15 working days prior to the start of work, supply one 4-foot x 4-foot mock-up for approval by the engineer. At the project site, install a job mock-up using acceptable products and manufacturer approved installation methods. Include eave, ridge, gutter, gable and hip conditions. Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required. Mock-up may be incorporated into final construction upon approval from the engineer.

B.7 Roofing

B.7.1 Elastomeric Sheet Roofing

Furnish adhered elastomeric sheet membrane roofing, roof insulation boards, and flexible flashings as shown on the plans and carrying a minimum manufacturer's non-prorated warranty of 20 years. Achieve the requirements for a Class "A" rated Underwriter's

Laboratories, Inc. roof membrane assembly, and 80 mph requirements for wind uplift resistance.

Manufacturers offering elastomeric sheet membranes which may be incorporated in the work include Carlisle, Firestone, or approved equal.

Manufacturers offering roof insulation boards which may be incorporated in the work include Hunter Panels, Firestone, Atlas, Celotex, or approved equal.

Membrane materials shall conform to the following requirements:

- Single ply roofing membrane: 60 mil E.P.D.M. (ethylene propylene diene monomer) roofing sheet.
- Seaming materials: per membrane manufacturer.
- Roof flashing material: 60 mil (minimum) uncured EPDM by same manufacturer of roofing sheet.

Rigid insulation shall conform to the following requirements:

- 2 loosely applied layers of equal and uniform thickness of polyisocyanurate foam with glass fiber mat facers suitable for loose-laid insulation and ballasted single-ply roof membrane.
- Sheet sizes: 48 x 96 inch (minimum dimensions) with staggered joints (both directions) between layers.
- Manufacturer or roofing membrane shall approve insulation products and application procedure(s) before installation and certify approved in writing if requested.
- Minimum R-value by CAN/ULC-S770 15-year time-weighted average LTTR:
 - 2.0 inches: R12.1
 - 4.0 inches: R25.0

Tapered insulation shall conform to the following requirements:

- Roof saddles: Expanded polystyrene board.
- Minimum density: 1.5 PCF
- Minimum compressive strength: 15 PSI
- Thickness: as indicated on the plans.
- Sheet size: 48x96 inch. Factory pre-cut boards with top surface to provide continuous slopes indicated. Maximum thickness per layer shall not exceed 8 inches.

Furnish bonding adhesive, cements, primers, cleaners, mastics, foam rods, fillers, sealers, fastener strips, termination bars, coated rust resistant fasteners, sealants, perimeter fastener strips, etc. manufactured and/or approved for use by roof system manufacturer. Use compatible materials.

Furnish pipe seals for utilities projecting through the roof. Do not use pourable sealer pockets without the engineer's approval. Provide filler and sealer approved by roofing material manufacturer. Furnish metal dams in accordance to Section B.15 Flashing.

Vapor retarder shall be a high strength 2-ply kraft laminate with asphalt adhesive accepted for FM or UL construction assemblies.

B.7.2 Metal Roofing

Furnish factory-formed sheet metal roofing including flashings and trim carrying a minimum manufacturer's non-prorated warranty of 25 years. Obtain metal panel products from a single manufacturer. Furnish product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.

Furnish a system conforming to the following performance requirements:

- Air infiltration: Maximum 0.06 cfm per lineal foot of seam at static pressure of 6.24 psf when tested per ASTM E1680.
- No uncontrolled water penetration through the joints at a static pressure of 6.24 psf when tested in accordance with ASTM E1646.
- Color change and fade resistance: No cracking, peeling, blistering or loss of adhesion when tested in accordance with ASTM G23; color change, after removal of surface deposits such as dirt or chalk, maximum 5 NBS units.
- Humidity resistance: No blistering, peeling or loss of adhesion after 1000 hours testing, in accordance with ASTM D2247.

Manufactured metal roof panels shall conform to the following requirements:

- Profile: Vertical leg standing seam panel with male/female seams to be mechanically interlocked at jobsite with mechanical seamer per the manufacturer's recommendations.
- Size: 2" high seam by 16" width. Length as indicated on the plans.
- Panel Surface: Striated 2"
- Material: Galvalume steel sheet conforming to ASTM A792, AZ50 coating for bare; AZ50 coating for painted; 24 gauge sheet thickness.
- Finish: Polyvinylidene fluoride color coat, minimum 70% polyvinylidene fluoride resin content, applied to sight-exposed face of sheet after pretreatment and priming in accordance with coating manufacturer's recommendations.

Furnish the manufacturer's standard sheet metal trim matching panel material and finish, break-formed to profiles indicated on the plans, and including, but not limited to copings, gutters and downspouts, and termination and transition strips.

Supply galvanized clips and fasteners required for installation of panels in accordance with manufacturer's installation instructions and other indicated items.

The finish color, texture, and pattern of the metal panels shall match the City of Wauwatosa Design Review Board samples and are to be approved by the engineer prior to ordering materials. At least 15 working days prior to the start of work, supply one 4-foot x 4-foot mock-up for approval by the engineer. At the project site, install a job mock-up using acceptable products and manufacturer approved installation methods. Include eave, ridge, gutter, gable and hip conditions. Maintain mock-up during construction for

workmanship comparison; remove and legally dispose of mock-up when no longer required.

B.8 Mechanical

B.8.1 General

The limits of mechanical work for Storage Building 1, Storage Building 2, and the Salt Brine Building includes the interior and extends 5'-0" beyond the face of each building structure at grade as shown on the plans. All mechanical work beyond the 5'-0" limits as noted above, is separately quantified and is not included herein.

Furnish mechanical materials in accordance to the standards shown on the plans and specified herein.

B.8.1.1 HVAC Identification

Furnish identification materials conforming to the following requirements:

- Stencils: Not less than 1 inch high letters/numbers for marking pipe and equipment.
- Snap-on Pipe Markers: Cylindrical self-coiling plastic sheet that snaps over piping insulation and is held tightly in place without the use of adhesive, tape or straps. Not less than 1 inch high letters/numbers and flow direction arrows for piping marking. Acceptable manufacturers are as follows: W. H. Brady, Seton, Marking Services, or approved equal.
- Engraved Name Plates: White letters on a black background, 1/16 inch thick plastic laminate, beveled edges, and screw mounting. Acceptable manufacturers are as follows: Setonply Style 2060 by Seton Name Plate Company, Emedolite- Style EIP by EMED Company, Marking Services, W. H. Brady, or approved equal.
- Valve Tags: Round brass tags with 1/2 inch numbers, 1/4 inch system identification abbreviation, 1-1/4 inch minimum diameter, with brass jack chains or brass "S" hooks around the valve stem. Acceptable manufacturers are as follows: EMED Company, Seton Name Plate Company, Marking Services, W. H. Brady, or approved equal.

B.8.1.2 Sealing and Firestopping

For fire and/or smoke rated penetrations, furnish materials conforming to the following requirements:

- Manufacturers: 3M, Hilti, Rectorseal, STI/SpecSeal, Tremco, or approved equal.
- All firestopping systems shall be provided by the same manufacturer.
- Fire stop systems shall be UL listed or tested by an independent testing laboratory approved by the Department of Commerce.
- Submittals: Submit product data for each firestop system. Submittals shall include product characteristics, performance and limitation criteria, test data, MSDS sheets, installation details and procedures for each method of installation applicable to this project. For non-standard conditions where no UL tested system exists, submit manufacturer's drawings for UL system with known performance for which an engineering judgment can be based upon.

- Use a product that has a rating not less than the rating of the wall or floor being penetrated. Reference plan drawings for identification of fire and/or smoke rated walls and floors.
- Use firestop putty, caulk sealant, intumescent wrapstrips, intumescent firestop collars, firestop blocks, firestop mortar or a combination of these products to provide a UL listed system for each application required for this project. Provide mineral wool backing where specified in manufacturer's application detail.

For non-rated penetrations, furnish materials in accordance to the following requirements:

- In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the uninsulated pipe and the cored opening or a water-stop type wall sleeve.
- At pipe penetrations of non-rated interior partitions, floors and exterior walls, use urethane caulk in annular space between pipe insulation and sleeve. For non-rated drywall, plaster or wood partitions where sleeve is not required use urethane caulk in annular space between pipe insulation and wall material.
- Where shown on the plans or specified herein, pack annular space with fiberglass batt insulation or mineral wool insulation. Provide 4-inch sheet metal escutcheon around duct on both sides of partition or floor to cover annular space.

B.8.2 Motors for HVAC Equipment

B.8.2.1 Product Criteria

Motors shall conform to all applicable requirements of NEMA, IEEE, ANSI, and NEC standards and shall be listed by UL for the service specified. Select motors for conditions in which they will be required to perform; i.e., general purpose, splashproof, explosion proof, standard duty, high torque or any other special type as required by the equipment or motor manufacturer's recommendations.

Furnish motors for starting in accordance with utility requirements and compatible with starters as specified.

B.8.2.2 Single Phase, Single Speed Motors

Furnish NEMA rated 115 volt, single phase, 60 hertz motors for all motors 1/3 HP and smaller. Use permanent split capacitor or capacitor start, induction run motors equipped with permanently lubricated and sealed ball or sleeve bearings and Class A insulation. Service factor shall be not less than 1.35.

B.8.3 Valves for HVAC Piping

Where valves are specified for individual mechanical services, all valves shall be of the same manufacturer unless prior written approval is obtained from the engineer.

Submit a schedule of all valves indicating type of service, dimensions, materials of construction, and pressure/temperature ratings for all valves to be used on the project. Temperature ratings specified are for continuous operation.

Acceptable manufacturers are as follows: Anvil, Armstrong, Bell & Gossett, Cash-Acme, Consolidated, Conval, Crane, Crosby, DeZurik, Durco, Fisher, Grinnell, Griswald, Hammond, Hancock, Hoffman, Illinois, Jamesbury, Keystone, Kunkle, Leslie, Lunkenheimer, Metraflex, Milwaukee, Mission, Mueller, Newco, Nexus, Nibco, Powell, RP&C, Sarco, Spence, Stockham, Taco, Tasco, Thrush-Amtrol, Vogt, Watts, or approved equal.

For natural gas systems, furnish shut off valves conforming to the following requirements:

- 2" and smaller: Ball valve, bronze body, threaded ends, stainless steel ball, full or conventional port, teflon seat, blowout-proof stem, two-piece construction, suitable for 150 psig working pressure, UL listed for use as natural gas shut-off.
- 2-1/2" through 4": Cast iron body, flanged ends, bronze bearings, electroless nickel plated cast iron plug with Hycar resilient plug seal, Buna-N stem seal packing, lever actuator, 175 psi W.O.G., UL listed for use as natural gas shut-off.
- 5" and larger: Cast iron body, flanged ends, stainless steel bearings, resilient faced plugs, totally enclosed hand wheel actuators, 175 psi W.O.G., UL listed for use as natural gas shut-off.
- Acceptable manufacturers are as follows: DeZurik, Homestead, Rockwell, Walworth, or approved equal.

Furnish gas pressure regulators conforming to the following requirements:

- 2" and smaller: Cast iron body, aluminum spring and diaphragm, Nitrile diaphragm, threaded ends, 150 psi W.O.G., -20°F to 150°F.

B.8.4 Hangers and Supports for HVAC Piping and Equipment

B.8.4.1 General

Provide all supporting devices as required for the installation of mechanical equipment and materials. All supports and installation procedures are to conform to the latest requirements of the ANSI Code for pressure piping.

Do not hang any mechanical item directly from a metal deck or run piping so it rests on the bottom chord of any truss or joist. Support apparatus and material under all conditions of operation, variations in installed and operating weight of equipment and piping, to prevent excess stress, and allow for proper expansion and contraction.

Protect insulation at all hanger points

B.8.4.2 Design Criteria

Materials and application of pipe hangers and supports shall be in accordance with MSS Standard Practice SP-58 and SP-69 unless noted otherwise.

Piping connected to base mounted pumps, compressors, or other rotating or reciprocating equipment shall have vibration isolation supports for a distance of one hundred pipe diameters or three supports away from the equipment, whichever is greater. Standard pipe hangers and supports as specified in this section are required beyond the 100 pipe diameter/3 support distance.

Piping flexible connections and vibration isolation supports are required for piping connected to coils that are in a fan assembly where the entire assembly is mounted on vibration supports; the vibration isolation supports are required for a distance of one hundred pipe diameters or three supports away from the equipment, whichever is greater. Piping flexible connection and vibration isolation supports are not required when the fan section is separately and independently isolated by means of vibration supports and duct flexible connections. Standard pipe hangers and supports as specified in this section are required when there are no vibration isolation devices in the piping and beyond the 100 pipe diameter/3 support distance.

Piping supported by laying on the bottom chord of joists or trusses will not be accepted.

Fasteners depending on soft lead for holding power or requiring powder actuation will not be accepted.

Allow sufficient space between adjacent pipes and ducts for insulation, valve operation, and routine maintenance.

B.8.4.3 Pipe Hangers and Supports

Furnish all supporting steel required for the installation of mechanical equipment and materials, whether or not it is specifically indicated or sized, including angles, channels, beams, etc. to suspend or floor support tanks and equipment. Acceptable pipe hanger and support manufacturers are as follows: Cooper B-Line, Fee and Mason, Grinnell, Kindorf, Michigan Hanger, Unistrut, or approved equal.

Furnish pipe hangers and supports conforming to the following requirements:

- Hangers for Steel Pipe Sizes 1/2" Through 2":
 - Carbon steel, adjustable, clevis, black finish.
- Hangers for Steel Pipe Sizes 2-1/2" and Over:
 - Carbon steel, adjustable, clevis, black finish; or adjustable steel yoke, cast iron roll, double hanger.
- Multiple or Trapeze Hangers:
 - Steel channels with welded spacers and hanger rods if calculations are submitted to the engineer.
- Wall Support:
 - Welded steel bracket with hanger.
 - Perforated epoxy painted finish, 16-12 gauge minimum, steel channels securely anchored to wall structure with interlocking, split type, bolt secured, galvanized pipe/tubing clamps. When copper piping is being supported, provide flexible elastomeric/thermoplastic isolation cushion material to completely encircle the piping and avoid contact with the channel or clamp or provide manufacturers clamp and cushion assemblies.
- Vertical Riser Support:
 - Carbon steel riser clamp, copper plated when used with copper pipe.

- Insulation Protection Shields:
 - Galvanized carbon steel of not less than 18 gauge for use on insulated pipe 2-1/2 inch and larger. Minimum shield length shall be 12 inches.
- Steel Hanger Rods:
 - Threaded both ends, threaded one end, or continuous threaded, black finish.
 - Size rods for individual hangers and trapeze support as indicated in the following schedule.
 - Total weight of equipment, including valves, fittings, pipe, pipe content, and insulation, are not to exceed the following limits indicated.
 - Provide rods complete with adjusting and lock nuts.

Maximum Load (Lbs.) (650°F Maximum Temp.)	Rod Diameter (inches)
610	3/8
1130	1/2
1810	5/8

B.8.4.4 Beam Clamps

Furnish beam clamps conforming to the following requirements:

- MSS SP-69 Type 23 malleable black iron clamp for attachment to beam flange to 0.62 inches thick for single threaded rods of 3/8, 1/2, and 5/8 inch diameter, for use with pipe sizes 4 inch and less. Furnish with a hardened steel cup point set screw.
- MSS SP-69 Type 28 or Type 29 forged steel jaw type clamp with a tie rod to lock clamp in place, suitable for rod sizes to 1-1/2 inch diameter but limited in application to pipe sizes 8 inch and less without prior approval from the engineer.

B.8.4.5 Corrosive Atmosphere Coatings

The Salt Brine Building is a corrosive atmosphere. Furnish Type 304 stainless steel pipe supports for use in corrosive atmospheres. Stainless steel pipe supports shall comply with ANSI / MSS SP-58.

B.8.5 Building Facility Fuel Piping

B.8.5.1 Design Criteria

Submit schedule indicating the ASTM specification number of the pipe being proposed along with its type and grade and sufficient information to indicate the type and rating of fittings for each service.

Order all Type E and Type S steel pipe with heat numbers rolled, stamped, or stenciled to each length or each bundle, depending on the size of the pipe, and in accordance with the appropriate ASTM specification. Any installed material not meeting the specification requirements must be replaced with material that meets these specifications without additional cost to the department. Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM specifications.

Construct all piping for the highest pressures and temperatures in the respective system in accordance with ANSI B31, but not less than 125 psig unless specifically indicated otherwise. Non-metallic piping will be acceptable only for the services indicated. It will not be acceptable in occupied spaces and ventilation plenum spaces, including plenum ceilings.

Where weld fittings or mechanical grooved fittings are used, furnish only long radius elbows having a centerline radius of 1.5 pipe diameters. Where ASTM A53 grade A pipe is specified, ASTM A53 grade B pipe may be substituted. Where the grade or type is not specified, contractor may choose from those commercially available.

B.8.5.2 Natural Gas Service

All charges for the gas service as shown on the plans, including the connection from the main in the street or other location to the gas meter, shall be paid by the contractor, including setting of gas meter(s) and all work performed by the gas company.

Furnish natural gas materials conforming to the following requirements:

- 2" and Smaller: ASTM A53, type E or S, standard weight (schedule 40) black steel pipe with ASTM A197/ANSI B16.3 class 150 black malleable iron threaded fittings or ASTM A234 grade WPB/ANSI B16.9 standard weight, seamless, carbon steel weld fittings.
- 2-1/2" and Larger: ASTM A53, type E or S, standard weight black steel pipe with ASTM A234 grade WPB/ANSI B16.9 standard weight, seamless, carbon steel weld fittings.

For vents and relief valves, use pipe and pipe fittings as specified for the system to which the relief valve or vent is connected.

Unions and flanges shall conform to the following requirements:

- 2" and Smaller: ASTM A197/ANSI B16.3 malleable iron unions with brass seats. Use black malleable iron on black steel piping and galvanized malleable iron on galvanized steel piping. Use unions of a pressure class equal to or higher than that specified for the fittings of the respective piping service but not less than 250 psi.
- 2-1/2" and Larger: ASTM A181 or A105, grade 1 hot forged steel flanges of threaded, welding and of a pressure class compatible with that specified for valves, piping specialties and fittings of the respective piping service. Flanges smaller than 2-1/2" may be used as needed for connecting to equipment and piping specialties. Use raised face flanges per ANSI B16.5 for mating with other raised face flanges on equipment with flat ring or full face gaskets. Use ANSI B16.1 flat face flanges with full face gaskets for mating with other flat face flanges on equipment.

B.8.6 Fuel-Fired Heaters

B.8.6.1 Warranty

Furnish gas fired unit heaters heat exchangers warranted for five years. Remainder of unit heater components shall be warranted for 1 year from startup.

Furnish radiant heat tubes warranted against internal corrosion for 10 years. Remainder of infrared radiant heater components shall be warranted for 1 year from date of startup.

Furnish direct fired make-up air units warranted for 12 months from date of startup.
Furnish indirect fired make-up air units warranted for 12 months from date of startup.

B.8.6.2 Gas Fired Unit Heaters

Acceptable manufacturers of gas fired unit heaters include: Modine, Reznor, Sterling, Trane, or approved equal. Gas fired unit heaters shall be horizontal discharge, direct vent sealed combustion type, and AGA certified for use with natural gas. Minimum annual fuel utilization efficiency (A.F.U.E.) shall be 80. All wiring shall comply with the National Electrical Code.

Construct casing of cold rolled steel with baked enamel finish. Furnish direct drive propeller type fan statically and dynamically balanced and including fan safety guard and adjustable vertical and horizontal louvers for control of air diffusion on discharge of unit. Use Type 316 stainless steel burners, electronic spark ignition with electronic flame supervision and timed lockout control. Furnish heavy gauge stainless steel heat exchanger and factory installed induced draft blower for heat exchanger pre-purge and combustion gas venting. Provide a hinged access panel on the bottom of the unit to access the burner or provide side access (pull out drawer) to burner assembly. Use a single point power connection. Unit shall be approved for vertical or side wall venting.

Unit heater exterior shall be coated with a Heresite P-413C coating.

Provide spark ignited intermittent pilot system with electronic flame supervision and AGA gas controls, including manual main shut off valve, 24 volt redundant combination gas control valve with 100 percent safety shut off valve and main gas pressure regulator.

Provide fan controls and limit safety controls including but not limited to:

- Pressure switch to verify combustion/exhaust gas airflow.
- High limit controls.
- Fan time delay to delay the fan start until the heat exchanger reaches a predetermined temperature and to allow the fan to operate, after burner shut down, to remove heat exchanger residual heat.

Furnish an air inlet/vent termination assembly and threaded hanger connections.

B.8.7 Heating Terminal Units

Ratings for forced circulation coils shall be certified in accordance with ARI 410. Electrical equipment and heaters shall be UL listed for the service specified. Electrical components and work shall be in accordance with the National Electrical Code.

Acceptable manufacturers of electric heaters include: Berko, Chromalox, Markel, Trane, or approved equal. Use corrosion resistant heating elements, designed and spaced for even distribution of air across the heating element and installed to prevent noise of expansion and contraction.

Furnish units with necessary overheat protection, reset devices, air flow interlock switch, contactors, transformers, local non-fused disconnect switch that is prewired, and other controls as may be required by codes.

Fan powered units must be provided with thermostat and controls to maintain fan operation until residual heat in the heating elements has been dissipated. The fans and motors shall be balanced and mounted for vibration free operation.

Construct cabinets of 20 gauge steel. Furnished exposed cabinets with a baked enamel finish in one of the manufacturer's standard colors as selected by the engineer.

B.9 Plumbing

B.9.1 General

The limits of plumbing work for Storage Building 1, Storage Building 2, and the Salt Brine Building includes the interior and extends 5'-0" beyond the face of each building structure at grade as shown on the plans. The only exception is a 2-inch non-potable water line which runs from the south side of Storage Building 2 to a yard hydrant and is included in the bid item for Storage Building 2. All other plumbing work beyond the 5'-0" limits as noted above, is separately quantified and is not included herein.

Furnish plumbing materials in accordance to the standards shown on the plans and specified herein. All products and materials used are to be new, undamaged, clean and in good condition.

B.9.1.1 Lead Free Requirements

All materials that contact potable water shall be lead free. Lead free refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content $\leq 0.25\%$ per the Federal Safe Drinking Water Act as amended January 4, 2011 Section 1417. This requirement applies to all of the subsequent plumbing specification sections and plumbing drawings and supersedes any part or model number that may conflict with this requirement.

B.9.1.2 Plumbing Identification

Furnish identification materials conforming to the following requirements:

- Engraved Name Plates:
 - White letters on a black background, 1/16 inch thick plastic laminate, beveled edges, screw mounting. Acceptable manufacturers are as follows: Setonply Style 2060, W.H. Brady, MSI, or approved equal.

- Adhesive Labels:
 - Pressure-sensitive, adhesive backed vinyl pipe markers with applicable labeling, 3/4" min. size for lettering with flow arrows and conforming to ANSI / ASME A.13-2007 standards. Acceptable manufacturers are as follows: Seton Opti-Code, MSI, W.H. Brady, or approved equal. Clean piping and/or insulation before application.
- Snap-around pipe markers:
 - One-piece, preformed, vinyl construction, snap-around or strap-around pipe markers with applicable labeling and flow direction arrows, 3/4" min. size for lettering. Provide nylon ties on each end of pipe markers. Acceptable manufacturers are as follows: Seton Setmark, W.H. Brady, MSI, or approved equal.
- Valve Tags:
 - Round brass tags with 1/2 inch numbers, 1/4 inch system identification abbreviation, 1-1/4 inch minimum diameter, with brass jack chains and brass "S" hooks around the valve stem. Acceptable manufacturers are as follows: Seton, W. H. Brady, MSI, or approved equal.
- Underground Warning Tape:
 - Detectable underground warning tape, 5.0 mil overall thickness, 6" width, 0.0035" thick aluminum foil core with polyethylene jacket bonded to both sides. Color code tape and print caution along with name of buried service in bold letters on face of tape. Acceptable manufacturers are as follows: Seton, W.H. Brady, MSI, or approved equal.
- Underground Tracer Wire:
 - All underground non-metallic sewers/mains and water services/mains shall be provided with tracer wire installations. Tracer wire installations shall conform with Section 182.0715(2r) of Wisconsin Statutes and prevailing Department of Safety and Professional Services Chapter 384 requirements. Tracer wire shall be continuous solid copper or steel plastic coated with split bolt or compression-type connectors.

B.9.1.3 Plumbing Bedding and Backfill

Within the interior and extending to 5'-0" beyond the face of each building structure at grade as shown on the plans, thoroughly compact sand or crushed stone chip bedding up to a point 12 inches above the top of the pipe. Bedding and backfill shall meet the following gradations:

Gradation for Bedding Sand		Gradation for Crushed Stone Chip Bedding	
Sieve Size	% Passing (by Wt)	Sieve Size	% Passing (by Wt)
1 inch	100	1/2 inch	100
No. 16	45 - 80	No. 4	75 - 100
No. 200	2 - 10	No. 100	10 - 25

Backfill above the bedding under existing and future utilities, paving, sidewalks, curbs, roads and buildings shall be granular materials, pit run sand, gravel, or crushed stone, free from large stones, organic, perishable, and frozen materials.

B.9.1.4 Sealing and Firestopping

For fire and/or smoke rated penetrations, furnish materials conforming to the following requirements:

- Manufacturers: 3M, Hilti, Tremco, or approved equal.
- All firestopping systems shall be provided by the same manufacturer.
- Fire stop systems shall be UL listed or tested by an independent testing laboratory approved by the Department of Commerce.
- Submittals: Submit product data for each firestop system. Submittals shall include product characteristics, performance and limitation criteria, test data, MSDS sheets, installation details and procedures for each method of installation applicable to this project. For non-standard conditions where no UL tested system exists, submit manufacturer's drawings for UL system with known performance for which an engineering judgment can be based upon.
- Use a product that has a rating not less than the rating of the wall or floor being penetrated. Reference plan drawings for identification of fire and/or smoke rated walls and floors.
- Use firestop putty, caulk sealant, intumescent wrapstrips, intumescent firestop collars, firestop blocks, firestop mortar or a combination of these products to provide a UL listed system for each application required for this project. Provide mineral wool backing where specified in manufacturer's application detail.

For non-rated penetrations, furnish materials in accordance to the following requirements:

- In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the uninsulated pipe and the cored opening or a water-stop type wall sleeve. The operating bolts of the mechanical type seal shall be accessible from the interior of the building.
- At pipe penetrations of non-rated interior partitions, floors and exterior walls, use urethane caulk in annular space between pipe insulation and sleeve. For non-rated gypsum board, plaster or wood partitions where sleeve is not required use urethane caulk in annular space between pipe insulation and wall material.

B.9.1.5 Concrete Work

Provide all anchor bolts, metal shapes, and/or templates required to be cast into concrete or used to form concrete for support or installation of plumbing piping, fixtures, specialties and equipment. Coordinate locations of equipment and pipe penetrations in wet areas.

B.9.2 Plumbing Specialties

Furnish plumbing specialties conforming to the following requirements:

- Floor Drains
 - Manufacturers: Josam, Smith, Sioux Chief, Watts, Zurn, or approved equal.
 - FD-1: 4" enameled heavy duty cast iron two piece body with double drainage flange, weep holes, heavy duty adjustable 9" round coated cast iron tractor grate strainer, with sediment bucket, bottom outlet and with the addition of the trap guard diaphragm called out below Zurn Z-556-Y.
- Trap Guards
 - Flexible elastomeric PVC construction diaphragm trap guard for installation in new and existing floor drains, hub drains, and trench drains; ASSE 1072. Trap guard to prevent trap evaporation and waste backflow. Size as applicable to the drain outlet size, up to 4" size.
- Hub Drains
 - Manufacturers: Josam, Smith, Sioux Chief, Watts, Zurn, or approved equal.
 - HD-1: 3" minimum cast iron hub section up 2" minimum above floor level, with full-sized deep seal P-trap and with the addition of the trap guard diaphragm called out above.
- Roof Drains
 - Manufacturers: Josam, Smith, Sioux Chief, Watts, Zurn, or approved equal.
 - RD 1: 4" minimum bottom outlet roof drain, enameled cast iron body with flashing collar and gravel stop, cast iron dome strainer, adjustable extension, underdeck clamp, 15" diameter.
- Cleanouts
 - Manufacturers: Josam, Smith, Sioux Chief, Watts, Zurn, or approved equal.
 - Interior Concrete Floor Areas: Enameled cast iron body with round or square adjustable scoriated polished nickel bronze cover, tapered threaded ABS closure plug.
 - Interior Finished Wall Areas: Line type cleanout tee with tapered threaded ABS cleanout plug, round polished stainless steel access cover secured with machine screw. Screw shall not pass completely through the ABS plug. Trim screw as necessary.
 - Interior Exposed Vertical Stacks: Line type cleanout tee with tapered threaded ABS closure plug.
 - Interior Horizontal Lines: Cast iron hub with tapped ferrule and tapered threaded ABS or PVC closure plug, or no-hub coupling and blind plug.
- Water Hammer Arrestors
 - Manufacturers: PPP Industries, Sioux Chief, Watts, or approved equal.
 - ANSI A112.26.1, ASSE 1010; sized in accordance with PDI WH 201, precharged piston type constructed of hard drawn Type K copper, threaded brass adapter, brass piston with o-ring seals, FDA approved silicone lubricant, suitable for operation in temperature range 35 to 150 degrees F, maximum 250 psig working pressure, 1500 psig surge pressure.

- Backflow Preventers
 - Manufacturers: Beeco, Conbraco, Febco, Watts, or approved equal.
 - Hose Connection Vacuum Breakers: ASSE 1011, brass or bronze construction, EPDM diaphragm and seat, rated for 125 psig and 180 deg F.
 - Reduced Pressure Zone Backflow Preventers: ASSE 1013, reduced pressure zone backflow assembly complete with inlet strainer, inlet and outlet ball, or non-rising stem gate isolation valves. Line size for minimum pressure drop. Constructed of bronze or epoxy coated cast iron body with bronze and plastic internal parts, stainless steel springs, non-threaded vent outlet, 4 test cocks, rated for 175 psig and 210 deg F, with air gap apparatus on drain. Watts 009 is not considered an equal.
- Manholes
 - Precast reinforced concrete manhole sections, 48" diameter minimum manholes, 36" diameter minimum catch basins, ASTM C478. Construct base of 6" thick precast reinforced concrete or 8" thick cast in place concrete. Construct top of precast reinforced concrete eccentric cone and adjusting rings or 6" thick reinforced concrete slab with concentric opening.
 - Seal between sections with rubber ring gaskets, ASTM C443, or plastic preformed gasket material. Seal pipe penetrations with flexible watertight rubber gasketed seals.
 - Steps to be constructed of cast iron or polypropylene coated steel reinforcing rod.
 - Frame and cover or grate to be cast iron, ASTM A48, Class 35B, of style indicated, with minimum 24" diameter manhole opening, 20" diameter catch basin opening and pickhole. Provide gasketed self-sealing covers on sanitary manholes.
- Vent Flashings
 - Flashing boot of material compatible with roofing membrane with base flange for adhering to membrane and stainless steel drawband for securing to vent pipe.
- Water Meter
 - Supplied by Wauwatosa Water Department 7725 W. North Ave, Wauwatosa, WI 53213 – (414) 479-8963.

B.9.3 General Duty Valves for Plumbing Piping

Where valve types are specified for individual plumbing services, each valve type shall be of the same manufacturer unless prior written approval is obtained from the engineer. Valves to be line size unless specifically noted otherwise.

B.9.3.1 Water System Valves

Furnish water system valves conforming to the following requirements:

- All water system valves to be rated at not less than 125 water working pressure at 240 degrees F unless noted otherwise. All valves shall contain less than 15% zinc.

- Ball Valves
 - 3" and smaller: Two piece bronze body; sweat or threaded ends, stainless steel ball and stem; glass filled teflon seat; teflon packing and threaded packing nut; blowout-proof stem; 600 psig WOG. Provide valve stem extensions for valves installed in all piping with insulation. Acceptable manufacturers are as follows: Apollo 70-240LF, Milwaukee UPBA150S, Nibco S-580-66-LF, Watts LFB-6001-66, or approved equal.
- Drain Valves
 - 3/4 inch ball valve with integral threaded hose adapter, sweat or threaded inlet connections, with threaded cap and chain on hose threads. Acceptable manufacturers are as follows: Watts B-6000-CC/B-6001-CC series, Apollo, Kitz, Milwaukee, Nibco, or approved equal.

B.9.3.2 Compressed Air Systems

Furnish shut-off valves conforming to the following requirements:

- 3" and smaller: Two or three piece bronze body; threaded ends, chrome plated bronze ball; glass filled teflon seat; teflon packing and threaded packing nut; blowout-proof stem; 600 psig WOG. Acceptable manufacturers are as follows: Apollo 70-100, Kitz, Milwaukee BA100, Nibco T585-70 or T-590-Y, Watts B-6000, or approved equal.

B.9.3.3 Specialty Valves and Valve Accessories

Furnish gauge valves conforming to the following requirements:

- Use 1/4" ball valves. Needle valves and gauge cocks will not be accepted.

Furnish safety relief valves conforming to the following requirements:

- Bronze body, temperature and pressure actuated, stainless steel stem and spring, thermostat with non-metallic coating, test lever, suitable for 125 psig water working pressure at 240 degrees F, sized for full BTUH input and operating pressure of equipment, with valve capacity on metal label. For equipment less than or equal to 200,000 BTUH input, provide AGA, UL or ASME listed and labeled valve. Provide ASME listed and labeled valve for larger equipment. Acceptable manufacturers are as follows: Bell & Gossett, A. W. Cash, Conbraco, Watts, Wilkins, or approved equal. Temperature and pressure relief valve shall be sized per AGA rating for BTUH input, Re: SPS 382.40(5)(d).

B.9.4 Hangers and Supports for Plumbing Piping and Equipment

Provide all supporting devices as required for the installation of plumbing equipment and materials. All supports and installation procedures are to conform to the latest requirements of the ANSI Code for building piping. Fasteners depending on soft lead for holding power or requiring powder actuation will not be accepted.

Materials and application of pipe hangers and supports shall be in accordance with MSS Standard Practice SP-58 unless noted otherwise. Acceptable manufacturers of hangers and supports are as follows: Anvil, Cooper B-Line, Pate, or approved equal.

Piping connected to pumps, compressors, or other rotating or reciprocating equipment is to have vibration isolation supports for a distance of one hundred pipe diameters or three supports away from the equipment, whichever is greater. Standard pipe hangers/supports as specified in this section are required beyond the 100 pipe diameter/3 support distance.

Provide all supporting steel required for the installation of plumbing equipment and materials including angles, channels, beams, etc. to suspended or floor supported tanks and equipment. All of this steel may not be specifically indicated on the plans.

Furnish pipe hangers and supports conforming to the following requirements:

- Hangers for Pipe Sizes 1/2" Through 2"
 - Carbon steel, adjustable swivel ring. Acceptable manufacturers are as follows: Cooper B-Line B3170NF, Anvil 69 or 70, or approved equal.
 - Carbon steel, adjustable clevis, standard. Acceptable manufacturers are as follows: Cooper B-Line B3100, Anvil 260, or approved equal.
- Hangers for Pipe Sizes 2" and Larger
 - Carbon steel, adjustable clevis, standard. Acceptable manufacturers are as follows: Cooper B-Line B3100, Anvil 260, or approved equal.
- Multiple or Trapeze Hangers
 - Steel channels with welded spacers and hanger rods.
- Wall Support
 - Carbon steel welded bracket with hanger. Acceptable manufacturers are as follows: Cooper B-Line 3068 Series, Anvil 194 Series, or approved equal.
 - Perforated, epoxy painted finish, 16-12 gauge, minimum, steel channels securely anchored to wall structure, with interlocking, split-type, bolt secured, galvanized pipe/tubing clamps. Acceptable manufacturers are as follows: Cooper B-Line type S channel with B-2000 series clamps, Anvil type PS 200 H with PS 1200 clamps, or approved equal. When copper piping is being supported, provide flexible elastomeric/thermoplastic isolation cushion material to completely encircle the piping and avoid contact with the channel or clamp or provide manufacturers clamp and cushion assemblies. Acceptable manufacturers are as follows: Cooper B-Line BVT series, Anvil PS 1400 series, or approved equal.
- Vertical Support
 - Carbon steel riser clamp. Acceptable manufacturers are as follows: Cooper B-Line B3373, Anvil 261, or approved equal for above floor use.
- Floor Support
 - Carbon steel pipe saddle, stand and bolted floor flange.
- Copper Pipe Supports
 - All supports, fasteners, clamps, etc. directly connected to copper piping shall be copper plated or polyvinylchloride coated. Where steel channels are used, provide isolation collar between supports/clamps/fasteners and copper piping.

- Steel Hanger Rods
 - Threaded both ends, threaded one end, or continuous threaded, complete with adjusting and lock nuts.
 - Size rods for individual hangers and trapeze support as indicated in the following schedule.
 - Total weight of equipment, including valves, fittings, pipe, pipe content, and insulation, are not to exceed the limits indicated.

Maximum Load (Lbs.) (650°F Maximum Temp.)	Rod Diameter (inches)
610	3/8
1130	1/2
1810	5/8
2710	3/4
3770	7/8
4960	1
8000	1-1/4

- Beam Clamps
 - MSS SP-58 Types 19 & 23 malleable black iron clamp for attachment to beam flange to 0.62 inches thick with a retaining ring and threaded rod of 3/8, 1/2, and 5/8 inch diameter. Furnish with a hardened steel cup point set screw. Acceptable manufacturers are as follows: Cooper B-Line B3036L/B3034, Anvil 86/92, or approved equal.
 - MSS SP-58 Type 28 or Type 29 forged steel jaw type clamp with a tie rod to lock clamp in place, suitable for rod sizes to 1-1/2 inch diameter. Acceptable manufacturers are as follows: Cooper B-Line B3054, Anvil 228, or approved equal.
- Concrete Inserts - Poured in Place
 - MSS SP-58 Type 18 wedge type to be constructed of a black carbon steel body with a removable malleable iron nut that accepts threaded rod to 7/8 inch diameter. Wedge design to allow the insert to be held by concrete in compression to maximize the load carrying capacity. Acceptable manufacturers are as follows: Cooper B-Line B2505, Anvil 281, or approved equal.
 - MSS SP-58 Type 18 universal type to be constructed of black malleable iron body with a removable malleable iron nut that accepts threaded rod to 7/8 inch diameter. Acceptable manufacturers are as follows: Cooper B-Line B3014N, Anvil 282, or approved equal.
- Concrete Inserts - Drilled Fasteners
 - Carbon steel expansion anchors, vibration resistant, with ASTM B633 zinc plating. Use drill bit of same manufacturer as anchor. Acceptable manufacturers are as follows: Hilti, Rawl, Redhead, or approved equal.

B.9.5 Plumbing Insulation

B.9.5.1 General

Materials or accessories containing asbestos will not be accepted.

Use composite insulation systems (insulation, jackets, sealants, mastics, and adhesives) that have a flame spread rating of 25 or less and smoke developed rating of 50 or less, with the following exceptions: Insulation which is not located in an air plenum may have a flame spread rating not over 25 and a smoke developed rating no higher than 50.

B.9.5.2 Insulation and Jackets

Furnish insulation and jackets conforming to the following requirements:

- Manufacturers: Armstrong, Certainteed Manson, K-FLEX USA, Knauf, Owens-Corning, Johns-Mansville, or approved equal.
- Insulating materials shall be fire retardant, moisture and mildew resistant, and vermin proof. Insulation shall be suitable to receive jackets, adhesives and coatings as indicated.
- Rigid Fiberglass Insulation
 - Minimum nominal density of 3 lbs per cu. ft., and thermal conductivity of not more than 0.23 at 75 degrees F, minimum compressive strength of 25 PSF at 10% deformation, rated for service to 450 degrees F.
 - White kraft reinforced foil vapor barrier all service jacket, factory applied to insulation with a self-sealing pressure sensitive adhesive lap, maximum permeance of 0.02 perms and minimum beach puncture resistance of 50 units.
- Jacket material shall be the same as jacket for adjacent insulation.
- PVC Fitting Covers and Jackets
 - White PVC film, gloss finish one side, semi-gloss other side, FS LP-535D, Composition A, Type II, Grade GU. Ultraviolet inhibited indoor/outdoor grade to be used where exposed to high humidity, ultraviolet radiation, or installed outdoors. Jacket thickness shall be 0.02 inch.
- Insulation Inserts and Pipe Shields
 - Manufacturers: B-Line, Pipe Shields, Value Engineered Products, or approved equal.
 - Construct inserts with calcium silicate, minimum 140 psi compressive strength. Piping 12" and larger, supplement with high density 600 psi structural calcium silicate insert. Provide galvanized steel shield. Insert and shield to be minimum 180 degree coverage on bottom of supported piping and full 360 degree coverage on clamped piping. On roller mounted piping and piping designed to slide on support, provide additional load distribution steel plate.
 - Where contractor proposes shop/site fabricated inserts and shields, submit schedule of materials, thicknesses, gauges and lengths for each pipe size to demonstrate equivalency to pre-engineered, pre-manufactured product described above. On low temperature systems, extruded polystyrene may be substituted for calcium silicate provided insert and shield length and gauge are increased to compensate for lower insulation compressive strength.

- Precompressed 20# density molded fiberglass blocks of same thickness as adjacent insulation may be substituted for calcium silicate inserts with one 1"x 6" block for piping through 2-1/2" and three 1" x 6" blocks for piping through 4". Submit shield schedule to demonstrate equivalency to pre-engineered/pre-manufactured product described above.
- Wood blocks will not be accepted.

B.9.5.3 Accessories

All products shall be compatible with surfaces and materials on which they are applied, and be suitable for use at operating temperatures of the systems to which they are applied.

Adhesives, sealants, and protective finishes shall be as recommended by insulation manufacturer for applications specified.

Insulation bands shall be 3/4 inch wide, constructed of aluminum or stainless steel. Minimum thickness shall be 0.015 inch for aluminum and 0.010 inch for stainless steel.

Tack fasteners shall be stainless steel ring grooved shank tacks.

Staples to be clinch style.

Insulating cement shall be ANSI/ASTM C195, hydraulic setting mineral wool. Finishing cement shall be ASTM C449.

Fibrous glass or canvas fabric reinforcing shall have a minimum untreated weight of 6 oz/sq. yd.

Bedding compounds shall be non-shrinking and permanently flexible.

Vapor barrier coatings shall be non-flammable, fire resistant, polymeric resin. Fungicidal water base coating (Foster 40-20 or equal) shall be compatible with vapor barrier coating.

B.9.6 Building Water Distribution

B.9.6.1 General

Order all copper, cast iron, steel, and PVC pipe with each length marked with the name or trademark of the manufacturer and type of pipe and with each shipping unit marked with the purchase order number, metal or alloy designation, temper, size, and name of supplier.

Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM, AWWA or CISPI specifications. Construct all piping for the highest pressures and temperatures in the respective system.

Non-metallic piping will be acceptable only for the services indicated. It will not be acceptable in ventilation plenum spaces, including plenum ceilings.

Where weld fittings or mechanical grooved fittings are used, use only long radius elbows having a centerline radius of 1.5 pipe diameters.

Where ASTM B88, type L H (drawn) temper copper tubing is specified, ASTM B88, type K H (drawn) temper copper tubing may be substituted.

B.9.6.2 Domestic Water

Furnish above ground domestic water materials conforming to the following requirements:

- Type L copper water tube, H (drawn) temper, ASTM B88; wrought copper pressure fittings, ANSI B16.22; lead free (<.2%) solder, ASTM B32; flux, ASTM B813; copper phosphorous brazing alloy, AWS A5.8 BCuP. Copper mechanical grooved fittings and couplings on roll grooved pipe may be used in lieu of soldered fittings.
- Ductile iron pipe, thickness Class 53, AWWA C151/C115; with standard thickness cement mortar lining, AWWA C104; ductile iron mechanical grooved cement mortar lined fittings and couplings on cut grooved pipe, Class 350 12" and below, Class 250 above 12", AWWA C606; ductile iron or gray iron flanged cement mortar lined fittings, Class 250, AWWA C110; rubber gasket joints with non-toxic gasket lubricant, AWWA C111.

Furnish below ground 2-1/2" and smaller domestic water materials conforming to the following requirements:

- Type K copper water tube, O (annealed) temper, ASTM B88; with cast copper pressure fittings, ANSI B16.18; wrought copper pressure fittings, ANSI B16.22; lead free (<.2%) solder, ASTM B32; flux, ASTM B813; or cast copper flared pressure fittings, ANSI B16.26.

Furnish below ground 3" and larger domestic water materials conforming to the following requirements:

- Ductile iron pipe, mechanical or push on joint, thickness Class 52, AWWA C151; with standard thickness cement mortar lining, AWWA C104; ductile iron or gray iron mechanical joint cement mortar lined fittings, Class 250, AWWA C110; ductile iron mechanical joint compact fittings, Class 350, AWWA C153; rubber gasket joints with non-toxic gasket lubricant, AWWA C111. Provide 8 mil tube or sheet polyethylene encasement of iron pipe and pipe fittings in accordance to AWWA C105.
- PVC pressure pipe, DR 18, Class 150, AWWA C900 and C905; with integral bell and elastomeric gaskets, ASTM D3139. Fittings and fitting polyethylene encasement to be same as noted above for ductile iron.

Furnish underground to interior building entrance piping 3" and larger domestic water materials conforming to the following requirements:

- Ductile iron as specified above with factory threaded and machined flanges.

B.9.6.3 Dielectric Unions and Flanges

Furnish dielectric unions 2" and smaller and dielectric flanges 2" and larger with iron female pipe thread to copper solder joint or brass female pipe thread end connections and non-asbestos gaskets, having a pressure rating of not less than 175 psig at 180 degrees.

Acceptable manufacturers are as follows: Watts Regulator Company, Lochinvar, Wilkins, EPCO Sales, Inc., or approved equal.

B.9.6.4 Unions and Flanges

Unions, flanges and gasket materials shall have a pressure rating of not less than 150 psig at 180 degrees. Gasket material for flanges and flanged fittings shall be teflon type. Treated paper gaskets are not acceptable.

Furnish 2" and smaller steel conforming to the following requirements:

- ASTM A197/ANSI B16.3 malleable iron unions with brass seats. Use black malleable iron on black steel piping and galvanized malleable iron on galvanized steel piping.

Furnish 2" and smaller copper conforming to the following requirements:

- ANSI B16.18 cast bronze union coupling or ANSI B15.24 Class 150 cast bronze flanges.

Furnish 2-1/2" and larger steel conforming to the following requirements:

- ASTM A181 or A105, grade 1 hot forged steel flanges of threaded, welding neck, or slip-on pattern on black steel and threaded only on galvanized steel. Use raised face flanges ANSI B16.5 for mating with other raised face flanges or equipment with flat ring or full face gaskets. Use ANSI B16.1 flat face flanges with full face teflon gaskets for mating with other flat face flanges on equipment. Gaskets shall be teflon type.

Furnish 2-1/2" and larger copper conforming to the following requirements:

- ANSI B15.24 Class 150 cast bronze flanges with full face teflon gaskets.

B.9.6.5 Mechanical Grooved Pipe Connections

Furnish mechanical grooved pipe couplings and fittings in accordance to ASTM F1476 as manufactured by Victaulic, Grinnell, Gruvlok, or approved equal. Mechanical grooved pipe connections may be used with cut groove galvanized steel pipe, cut groove ductile iron pipe or roll groove copper pipe where noted. Mechanical grooved components and assemblies shall be rated for minimum 250 psi working pressure.

All mechanical grooved pipe material including gaskets, couplings, fittings and flange adapters shall be from the same manufacturer.

Couplings shall be malleable iron, ASTM A47, or ductile iron, ASTM A536, with painted finish. Reducing couplings are not acceptable.

Fittings used on galvanized steel pipe shall be malleable iron, ASTM A47, or ductile iron, A536, with galvanized finish per ASTM A153. Fittings used on ductile iron pipe shall be cement mortar lined ductile iron with coal tar coating per ASTM A536; conforming to requirements of AWWA C110/C153 and AWWA C606. Fittings used on copper pipe shall be copper.

Gaskets shall be EPDM per ASTM D2000. Gaskets for hot water systems and dry pipe systems to be flush seal design. Furnish heat treated carbon steel oval neck track bolts and nuts per ASTM A183 with zinc electroplated finish per ASTM B633.

Flange adapters shall be ductile iron per ASTM A536; except at lug type butterfly valves where standard threaded flanges shall be used.

B.9.7 Building Sanitary Sewerage

B.9.7.1 General

Order all PVC pipe with each length marked with the name or trademark of the manufacturer and type of pipe and with each shipping unit marked with the purchase order number, metal or alloy designation, temper, size, and name of supplier.

Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM or CISPI specifications. Construct all piping for the highest pressures and temperatures in the respective system.

B.9.7.2 Sanitary Waste and Vent

Furnish sanitary waste and vent materials conforming to the following requirements:

- Interior Above Ground
 - PVC plastic pipe, Schedule 40, Class 12454-B (PVC 1120), ASTM D1785; PVC plastic drain, waste and vent pipe and fittings, ASTM D2665; socket fitting patterns, ASTM D3311; primer, ASTM F656; solvent cement, ASTM D2564.
- Interior Below Ground
 - PVC plastic pipe, Schedule 40, Class 12454-B (PVC 1120), ASTM D1785; PVC plastic drain, waste and vent pipe and fittings, ASTM D2665; socket fitting patterns, ASTM D3311; primer, ASTM F656; solvent cement, ASTM D2564.
- Exterior Below Ground 10" and Smaller
 - Non-reinforced concrete sewer, storm drain and culvert pipe, Class III, ASTM C14; rubber gasket joints, ASTM C443; bell and spigot ends with opposing shoulder or confined O-ring seal configuration, ASTM C302.
- Exterior Below Ground 15" and Smaller
 - PVC plastic pipe, Schedule 40, Class 12454-B (PVC 1120), ASTM D1785; PVC plastic drain, waste and vent pipe and fittings, ASTM D2665; socket fitting patterns, ASTM D3311; primer, ASTM F656; solvent cement, ASTM D2564.

- Type PSM PVC sewer pipe and socket fittings, SDR 35, Class 12454-B (PVC 1120), ASTM D3034; primer, ASTM F656; solvent cement, ASTM 2564; or integral bell and flexible elastomeric seal, ASTM D3212.

B.9.8 Building Storm Drainage

B.9.8.1 General

Order all copper, cast iron, steel, PVC and polyethylene pipe with each length marked with the name or trademark of the manufacturer and type of pipe and with each shipping unit marked with the purchase order number, metal or alloy designation, temper, size, and name of supplier.

Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM, AWWA or CISPI specifications. Construct all piping for the highest pressures and temperatures in the respective system.

Non-metallic piping will be acceptable only for the services indicated. It will not be acceptable in ventilation plenum spaces, including plenum ceilings.

Where weld fittings or mechanical grooved fittings are used, use only long radius elbows having a centerline radius of 1.5 pipe diameters.

Where ASTM A53 type F pipe is specified, grade A type E or S, or grade B type E or S may be substituted at the contractor's option. Where the grade or type is not specified, the contractor may choose from those commercially available.

Where ASTM B88, type L H (drawn) temper copper tubing is specified, ASTM B88, type K H (drawn) temper copper tubing may be substituted.

B.9.8.2 Storm and Clear Water Waste and Vent

Furnish storm and clear water waste and vent materials conforming to the following requirements:

- Interior Above Ground
 - Hubless cast iron soil pipe and fittings, CISPI Standard 301 and ASTM A888; joints shall conform to the requirements of ASTM Standard C-1540 and shall be heavy duty type 304, minimum 28 gauge, stainless steel shielded couplings. Pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute and be manufactured by AB&I, Charlotte, Tyler, or approved equal. Approved coupling manufacturers are as follows: Husky SD 4000, Clamp-All 80 or approved equal.
 - Type M copper water tube, H (drawn) temper, ASTM B88; with cast copper drainage fittings (DWV), ANSI B16.23; wrought copper drainage fittings (DWV), ANSI B16.29; lead free (<2%) solder, ASTM B32; flux, ASTM B813; copper phosphorous brazing alloy, AWS A5.8 BCuP.

- Copper drainage tube (DWV), ASTM B306; with cast copper drainage fittings (DWV), ANSI B16.23; wrought copper drainage fittings (DWV), ANSI B16.29; lead free (<.2%) solder, ASTM B32; flux, ASTM B813; copper phosphorous brazing alloy, AWS A5.8 BCuP.
- Interior Below Ground 15" and Smaller
 - Cast iron soil pipe and fittings, hub and spigot, service weight, CISPI Standard 301, ASTM A 888, and ASTM A74; with neoprene rubber compression gaskets, ASTM C564 and CISPI HSN 85. Pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute and be manufactured by AB&I, Charlotte, Tyler, or approved equal.
 - PVC plastic pipe, Schedule 40, Class 12454-B (PVC 1120), ASTM D1785; PVC plastic drain, waste and vent pipe and fittings, ASTM D2665; fitting patterns, ASTM D3311; primer, ASTM F656; solvent cement, ASTM D2564.
- Exterior Below Ground 10" and Smaller
 - Non-reinforced concrete sewer, storm drain and culvert pipe, Class III, ASTM C14; rubber gasket joints, ASTM C443; bell and spigot or tongue and groove ends.
- Exterior Below Ground 15" and Smaller
 - Cast iron soil pipe and fittings, hub and spigot, service weight, CISPI Standard 301, ASTM A 888, and ASTM A74; with neoprene compression rubber gaskets, ASTM C564 and CISPI HSN 85. Pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute and be manufactured by AB&I, Charlotte, Tyler, or approved equal.
 - PVC plastic pipe, Schedule 40, Class 12454-B (PVC 1120), ASTM D1785; PVC plastic drain, waste and vent pipe and fittings, ASTM D2665; fitting patterns, ASTM D3311; primer, ASTM F656; solvent cement, ASTM 2564.
 - Type PSM PVC sewer pipe and fittings, SDR 35, Class 12454-B (PVC 1120), ASTM D3034; primer, ASTM F656; solvent cement, ASTM 2564; or integral bell and flexible elastomeric seal, ASTM D3212.
 - Corrugated PVC pipe and fittings with smooth interior, ASTM F949; gasketed joint, ASTM D3212; elastomeric gasket, ASTM F477.
 - Corrugated polyethylene pipe with smooth interior and minimum pipe stiffness of 50 psi, ASTM F-405/ASTM F-667, AASHTO M-252/AASHTO M-294 Type S; PVC gasketed fittings, ASTM F1336; elastomeric gasket, ASTM F477.

B.9.9 Compressed Air Piping

B.9.9.1 General

Order all copper and steel pipe with each length marked with the name or trademark of the manufacturer and type of pipe and with each shipping unit marked with the purchase order number, metal or alloy designation, temper, size, and name of supplier.

Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM specifications. Construct all piping for the highest pressures and temperatures in the respective system.

Non-metallic piping will be acceptable only for the services indicated. It will not be acceptable in ventilation plenum spaces, including plenum ceilings.

Where weld fittings or mechanical grooved fittings are used, use only long radius elbows having a centerline radius of 1.5 pipe diameters.

Where ASTM A53 type F pipe is specified, grade A type E or S, or grade B type E or S may be substituted at the contractor's option. Where the grade or type is not specified, the contractor may choose from those commercially available.

Where ASTM B88, type L H (drawn) temper copper tubing is specified, ASTM B88, type K H (drawn) temper copper tubing may be substituted.

B.9.9.2 Compressed Air (Non-medical, Non-lab)

Furnish compressed air conforming to the following requirements:

- Instrument Air: Type L copper water tube, H (drawn) temper, ASTM B88; with cast copper pressure fittings, ANSI B16.18; wrought copper pressure fittings, ANSI B16.22; lead free (<.2%) solder, ASTM B32; flux, ASTM B813; copper phosphorous brazing alloy, AWS A5.8 BCuP.

B.9.10 Water Heaters

Furnish point of use electric water heater manufactured by A.O. Smith, Eemax, In-Sink-Erator, or approved equal. Water heater type shall be under counter point of use electric water heater, and design shall be UL listed with 1 year tank and parts warranty.

Tank shall be constructed of red brass rated for 150 psig with polystyrene insulation, steel jacket, temperature and relief valve sized per CSA rating with drain valve and wall bracket.

Heating element shall be replaceable threaded copper element with adjustable thermostat control, energy cutoff, on-off switch and 3-1/2' cord with grounded plug.

B.9.11 Plumbing Fixtures

Fixture descriptions establish fixture type, quality, materials, features and size. Furnish plumbing fixtures as shown on the plans and as specified herein. Acceptable manufacturers include:

- Faucets: Chicago Faucet, Kohler, Speakman, Symmons, T&S Brass, Zurn, or approved equal.
- Drains: Chicago Faucet, Kohler, McGuire, Zurn, or approved equal.
- Stops and Supplies (Heavy Duty Type): Chicago Faucet Company, T&S Brass, Kohler, McGuire, Zurn, or approved equal.

- Traps: Kohler, McGuire, Dearborn, Zurn, or approved equal. Traps shall be 17 gauge cast brass minimum.
- Trap Wrap: McGuire, Zurn, or approved equal.
- Carriers and Supports: Josam, Smith, Wade, Watts Drainage, Zurn, or approved equal.
- Service Sinks: American Standard, Crane, Kohler, or approved equal.
 - S-1: Wall mounted enameled cast iron service sink with stainless steel rim guard and wall hanger supports.
 - Drain: Trap with strainer, cleanout and floorplate.
 - Stops: Integral with faucet.
- Emergency Eyewash Fountains: Bradley, Encon, Chicago Faucet Company, Guardian, Haws, Speakman, or approved equal.
 - EEW-1: Wall mounted emergency eyewash with plastic bowl, eye and face wash fittings, 1/2" ball valve with push flag operator, dome strainer and wall bracket.
 - Trap: 1-1/4"x1-1/4" 17 gauge cast brass trap with tubular wall return.

B.10 Fans

Furnish two heavy-duty ceiling fans with 4 speed wall mounted controllers as shown on the plans for the heated carpenter room of Storage Building 2. Each fan shall have a 115 V ball bearing motor with a 42,500 CFM rating. The fans shall be 60-inch diameter and white in color with 18-inch downrods.

Fans to be powered from the lighting panel provided under the bid item Common Electrical Work Storage Building 2.

B.11 Overhead Doors

Furnish electrically operated insulated sectional overhead doors, operators, controls, openers and accessories. Provide unobstructed rectangular entrance openings with nominal dimensions as shown on the plans. In the openings, provide an upward acting sectional overhead door designed for a 30 psf minimum wind load and spring cycle requirements of 8,000 cycles. Supply and install all head and jamb framing and blocking as called for by door manufacturer.

Furnish door sections conforming to the following requirements:

- Material: Steel pan construction, 2 inches (51mm) thick, roll formed from 24 gauge minimum thickness commercial quality hot-dipped galvanized steel in compliance with ASTM A 924 and ASTM A 653. Each door section shall have two deep ribs, four pencil grooves, and roll-formed tongue-and-groove joints. End stiles and center stiles shall be riveted to outside face with stainless steel rivets and resistance welded to interior rail. End stiles and center stiles shall be minimum 16 gauge thickness.

- Mounting: Sections mounted in door opening using Lap Jamb Continuous Angle Mounting: section overlap door jambs by 1 inch on each side of door opening. Between-Jamb Bracket Mounting: sections mounted between door jambs, seal against exterior perimeter seal installed along vertical and top horizontal edges of door.
- Insulation: Polystyrene with Hardboard Covers: non-CFC expanded polystyrene with R-value of 16 and U-value of 0.07, with 1/8 inch prime-painted hardboard covers.
- Seals: Sections to be sealed at end stiles with 1/4 inch thick polyethylene foam. Bottom of door shall have flexible U-shaped vinyl seal in aluminum retainer.
- Trussing: Doors designed to withstand specified windload. Deflection of door in horizontal position to be maximum of 1/120th of door width.
- Color and Paint Type: White Kynar polyester paint. Exterior skin shall have two coats of paint, one primer coat and one finish coat.

Electric door operator shall be as recommended by door manufacturer for door size and lift condition, with standard hardware operable both from inside and outside of building. Door operators shall meet the following requirements:

- Type: Jackshaft.
- Motor Horsepower Rating: As Required.
- Electrical Requirements: 115 volt single phase.
- Duty Cycle: 30 cycles/hour.
- Control Wiring: 24 volt control with provisions for connection of safety edge to reverse and external radio control hook-up. Three button momentary contact "open-close-stop" required.

The track shall conform to the following requirements:

- Material: Hot-dipped galvanized steel (ASTM A-653), fully adjustable for adequate sealing of door to jamb or weatherseal.
- Configuration Type: Lift-Clearance.
- Size: 2 inches.
- Mounting: Floor-to-Header Angle-Mount consisting of continuous angle extending from the floor up to the door header for use with steel, wood, or masonry jambs. Continuous angle size not less than 2-5/16 inches by 4 inches by 3/32 inch.
- Finish: Galvanized.

Furnish a counterbalance system provided with aircraft-type, galvanized steel lifting cables with minimum safety factor of 5 to 1. Furnish torsion springs consisting of heavy-duty oil-tempered wire torsion springs on a continuous ball-bearing cross-header shaft.

Furnish the following hardware:

- Hinges and Brackets: Fabricated from galvanized steel.
- Track Rollers: 2 inches diameter consistent with track size, with hardened steel ball bearings.
- Perimeter Seal: Provide perimeter seal for jambs and header.
- Air Infiltration Seal: Provide air infiltration seal between door sections.

At least 15 working days prior to the start of work, submit selection and verification samples of the metal finishes, patterns, and colors for approval by the engineer.

B.12 Service Doors

B.12.1 Steel Doors

Furnish 16 gauge hollow metal doors conforming to Steel Door Institute (SDI)-100 according to the door schedules shown on the plans. Manufacturers offering standard steel doors which may be incorporated in the work include Ceco Corporation, Amweld, Steelcraft Manufacturing Company, Curries, Republic, or approved equal.

B.12.2 Fiberglass Doors

Furnish exterior fiberglass doors according to the door schedule shown on the Salt Brine Building plans and complying with the following requirements:

- E-P series (Extra Heavy Duty)
- Doors to have full height heavy duty vertical fiberglass stiffeners 6 inches on center for superior strength
- Expanded polystyrene solid foam core

Manufacturers offering fiberglass doors which may be incorporated in the work include Ceco Corporation, Amweld, Steelcraft Manufacturing Company, Curries, Republic, or approved equal.

B.13 Frames

B.13.1 Steel Frames

Furnish welded 14 gauge A60 galvanized steel frames conforming to SDI-100 according to the door schedules shown on the plans. Mortar guard boxes shall be minimum gauge and welded in place. Furnish door mutes in accordance with the manufacturer's standard resilient type, removable for replacement.

Manufacturers offering standard steel frames which may be incorporated in the work include Builders Hardware and Hollow Metal, Inc., Amweld, Ceco Corporation, Curries, Republic, Steelcraft Manufacturing Company, or approved equal.

B.13.2 Fiberglass Frames

Furnish pultruded fiberglass frames for service doors according to the door schedule shown on the Salt Brine Building plans. Comply with the requirements of grade specified for corresponding fiberglass doors. Frames for E-P (premier) series fiberglass doors shall be manufactured from 0.1875 inch thick fiberglass pultrusions. Profile must be of standard

hollow type to permit installation into new block walls. Solid (foam filled) or boxed frames will not be accepted.

Supports and anchors shall be fabricated from no less than 0.125 inch thick pultruded fiberglass material. Provide T-strap or wire wall anchors.

Manufacturers offering fiberglass frames which may be incorporated in the work include Ceco Corporation, Amweld, Steelcraft Manufacturing Company, Curries, Republic, or approved equal.

B.14 Window

Furnish window for the heated carpenter room conforming to the window schedule shown on the plans.

B.15 Flashing

The types of work specified in this section include prefinished flashing and sheet metal items, including but not limited to:

- Gutters
- Downspouts
- Fascias
- Cap flashing
- Rake flashing
- Drip edge flashing
- Miscellaneous flashings

Prefinished aluminum flashings, gutters, downspouts, fascia, drip edge and sheet metal items shall be 24-gauge minimum with a 20-year manufacturer's warranty on finish.

The color of the flashing and sheet metal materials shall match the City of Wauwatosa Design Review Board samples and are to be approved by the engineer prior to ordering materials. At least 15 working days prior to the start of work, supply samples of each material for approval by the engineer.

Miscellaneous materials and accessories shall conform to the following requirements:

- Fasteners: Same metal as flashing/sheet metal or other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.
- Bituminous Coating: TS TT-C-494 or SSPC - Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.
- Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, non-drying non-migrating sealant.
- Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed; comply with FS TT-S-0027, TT-S-00230, or TT-S-001543.

- Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size and gauge required for performance.

C Construction

C.1 General

Transport and safely unload building materials at the site. The contractor is responsible for the storage all materials. Erect the building structures at the site per the approved shop drawings using skilled personnel working under proper supervision. The work shall be carried out in a thoroughly high grade and workmanlike manner conforming to good building practices.

C.2 Earthwork and Excavation

Prepare the site for the building so that the grade within the building area is level to within plus or minus 2 inches, and so that the grade of the surrounding area slopes away from the building in all directions sufficiently to insure proper drainage. Excavate and backfill to proposed grade for the foundation footings and slabs. Compact backfill in accordance with standard spec 207.3.6.2.

C.3 Structural

C.3.1 Reinforcing Steel

Place reinforcement accurately in position as shown on the plans. Securely fasten and support reinforcement to prevent displacement before and during pouring. Cleaning, bending and placing of reinforcement shall be done in accordance with standard spec 505.

Provide connection points for the electrical service grounding electrode conductor in the Salt Brine Building and adjacent storage tank equipment pad. Provide similar for the grounding electrode conductor for neutral connection point of transformers XFMR-A and -B in Storage Building 2 and similar for transformer XFMR-E in Storage Building 1. Coordinate with the electrical contractor.

C.3.2 Structural Steel

C.3.2.1 Fabrication and Erection

Unless otherwise specified, structural steel shall be fabricated in accordance with the requirements of the AISC Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings. All members shall fit closely together and shall be straight and true, and the finished work shall be free from burrs, bends, twists, and open joints. Materials for welding shall be of the best available and in accordance with the recommendations of the manufacturer of the material to be welded.

All holes, angles, supports, and braces shall be provided as required.

All unmatched holes in shop assembly of field connections shall be reamed and the pieces match marked before disassembly. Drift pins shall be used only for bringing members into position and not to enlarge or distort holes. Any piece weakened by reaming to compensate for eccentricity to a point where the strength of the joint is impaired shall be

rejected and a new and satisfactory piece shall be provided by the contractor at his own expense. Slotted holes and washers shall be provided for trueing up steel requiring accurate alignment.

During erection, approved temporary bracing shall be installed as required to prevent distortion or damage to the framework due to wind or erection forces.

All beam connections shall be detailed for the loads indicated on the plans. Where loads are not indicated on the plans, connections shall be detailed in accordance with the requirements for framed beam connections and heavy framed beam connections and heavy frame beam connections (Table I, II, and III) of the AISC manual of steel construction ninth edition.

Do not use gas cutting torches in the field for correcting fabrication errors in the structural framing, except on secondary members which are not under stress and will be concealed in the finished structure and when approved by the engineer. Finish gas-cut sections equal to a sheared appearance.

Field connections shall be made by high-strength bolting except as called for on the plans.

Immediately after erection, clean field welds, bolted connections, and abraded areas of the shop paint primer. Apply touchup paint primer by brush or spray which is the same thickness and material as that used for the shop paint.

C.3.2.2 Welding

Welding shall be in accordance with the Structural Welding of the AWS D1.1-72 and shall only be done where shown on the plans, specified, or permitted by the engineer. Welding terms shall be interpreted in accordance with the Standards of the AWS. All welding shall be done only by certified welders using approved welding procedures and approved safety and welding equipment.

No welding will be allowed when surfaces are wet or exposed to rain, or wind, or when operators are exposed to inclement conditions that will hamper good workmanship.

Beam flanges employing full penetration welds shall have a 1-1/4-inch x 3/16-inch back up plate. Back gouge root pass and weld flush on backside of all beam webs where full penetration weld is specified.

All welds, including tack welds that are to be incorporated in the final welds, shall be made by a certified welder and shall be of as sound quality as final welds. Tack welds shall be cleaned and thoroughly fused and final weld. Defective, cracked or broken tack welds shall be removed before final welding. Tack welds must be removed from joints where stress is primary if welding is to be manual.

The welder shall place his identification mark with paint or stamping near the welds made by him in such a manner that all weldments can be properly associated with the welder who deposited them.

All weld metal shall be sound throughout and there shall be no cracks in any weld or weld pass. All craters shall be filled to the full cross-section of the welds. Remove weld scale or slag, spatter, burrs, and other sharp or rough projections in a manner that will leave the surface suitable for any required non-destructive testing and the subsequent cleaning and painting operation.

When welding is unsatisfactory or indicates inferior workmanship, corrective measures will be required by the engineer. Where requirements prescribe the removal of part of the weld or a portion of the base metal, such removal shall be by chipping or grinding. Where corrections require the deposition of additional weld metal, the sides of the area to be welded shall have no less than 1 to 1 slope to allow sufficient room for depositing new metal. Defective or unsound welds shall be corrected either by removing and replacing the entire weld, or as follows:

- Excessive convexity. Reduce to size by removal of excess weld metal by grinding.
- Shrinkage cracks, cracks in base metal, craters, and excessive porosity. Remove defective portions of base and weld metal down to sound metal, and deposit additional sound weld metal.
- Undercutting, undersize, and excessive concavity. Clean and deposit additional weld metal.
- Overlapping and incomplete fusion. Remove and replace the defective portion of weld.
- Slag inclusion. Remove those parts of the weld containing slag and fill with sound weld metal.
- Removal of adjacent base metal during welding. Clean and form full size by depositing additional weld metal.

Where corrections require the deposition of additional weld metal, the electrode used shall be smaller than the electrode used for making the weld. Surface shall be cleaned thoroughly before re-welding.

Cracked welds shall be removed throughout their length.

Where work performed subsequent to the making of a deficient weld has rendered the weld inaccessible or has caused new conditions which would make the correction of the deficiency dangerous or ineffectual, the original conditions shall be restored by removal of welds or members or both before making the necessary corrections, or else the deficiency shall be compensated by additional work according to a revised design approved by the engineer.

Improperly fitted and misaligned parts shall be cut apart and re-welded.

Any material or workmanship which is rejected by the engineer either at the shop, mill or building must be promptly replaced by the contractor to the engineer's entire satisfaction. In the event that faulty welding or its removal for re-welding, shall so damage the base metal that in the judgment of the engineer its retention is not in accordance with the intent of the plans and specifications, the contractor shall remove and replace the damaged material or shall compensate for the deficiency in a manner approved by the engineer.

C.3.2.3 Bolting

High-strength bolts shall conform to the Specifications for the Assembly of Structural Joints using High-Strength Steel Bolts, as approved by the Research Council on Riveted and Bolted Structural Joints using bolts conforming to ASTM Specification A 325F or A490 bolts.

All high strength bolts shall be tightened using direct tension indicators conforming to ASTM F 959-85 for all structural joints using ASTM A 325 or ASTM A 490 bolts. Direct tension indicators (load indicator washers - LIW) shall be tested and a test report shall be furnished in accordance with ASTM F 959-85. The engineer shall have free entry to the manufacturer's works to inspect the manufacture of the load indicator washer.

Special washer location requirements of ASTM F 959-85 shall be used at all bolt connections.

Tightening of each assembly shall progress systematically from the most rigid part of the joint toward the free edges until the load indicator washers on all bolts have been closed to the average gap less than that shown in Table 2 of ASTM F 959-85.

Load indicator washers shall not be substituted for the hardened flat washers required for overwise holes.

Anchor bolts shall be of the best quality mild steel with washers and hexagonal nuts. Threads shall be clean cut and of the American Standard size. Furnish anchor bolts and other connectors required for securing structural steel to in-place work. Anchor bolts shall be accurately set before the concrete is placed unless specifically permitted otherwise by the engineer.

C.3.2.4 Inspection

The engineer shall have free access to the work. Notify the engineer in writing four days in advance of any welding or high strength bolting operations. The engineer shall test the load indicator washers as indicated in Section 12 of ASTM F 959-85. If requested by the engineer, furnish three assemblies of bolt, nut, hardened washer, and LIW to the engineer for testing. The bolt installation shall be judged correct if the average gap is less than that shown in Table 2 of ASTM F 959-85.

Each bolting crew shall be assigned an identification mark. This mark shall be made at each completed connection with a paint stick.

Procedure specifications, procedure qualification tests, and welder's performance tests shall be in accordance with the latest provisions of section IX, Welding Qualifications, American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. All costs of preparing welding procedures specifications and the preparation of procedure and performance qualification test plates shall be paid for by the contractor.

The engineer may inspect all welding and fabrication equipment used in the work to determine that it conforms to the pertinent standard requirements of the latest AWS Specifications for such equipment.

When the quality of the welder's or welding operator's work appears to be below the requirements of these specifications, the engineer will require testing of his qualification by requalification, and any extra inspection costs incurred for this reason shall be paid by the contractor as a repair item.

Magnetic particle testing may be performed on all welds in accordance with Appendix VI "Method for Magnetic Particle Examination" of Section VIII, ASME Unfired Pressure Vessel Code, latest edition. Ultra sonic testing may be used in the inspection.

Any material or workmanship which is rejected by the engineer will require testing of his qualifications by requalification, and any extra inspection costs incurred for this reason shall be paid by the contractor as a repair item.

The fact that steel work has been accepted at the shop and mill shall not prevent its final rejection at the site or even after it has been erected, if it is found to be defective in any way.

Any steel work rejected at the site shall be removed by the contractor from the premises within ten working days from the time the contractor is notified of the rejection.

C.3.3 Anchors and Fasteners

Install per the manufacturer's recommendations. Embedment shall be as shown on the plans. If embedment is not shown, use 3-1/2 inch or 6 bolt diameters, whichever is greater.

C.4 Concrete

C.4.1 General

Install all required footings, foundations, slabs, and/or other required substructures or supports at the required elevations on properly prepared subgrade, as required for the erection of each complete building structure.

C.4.2 Cast in Place

The contractor is responsible for checking all dimensions and accuracy of the form work and reinforcing steel prior to placing the concrete. Make minor adjustments necessary in the footings and foundation to accomplish a vertical building axis and level horizontal foundation lines. Follow the normal and recommended practice for the placing and protection of the concrete in accordance to standard spec 501.

C.4.3 Precast Concrete Hollow Core Planks

C.4.3.1 Delivery and Handling

Mark units with date of production and final position in building structure in locations not visible to exterior view. Check each precast unit at fabrication site before loading for transportation to project site. Do not transport or use broken, cracked, spalled, warped or otherwise defective units. Coordinate delivery and erection of precast concrete planks, provide clear site, provide and maintain access roads to allow crane and trucks to reach work area under their own power.

Handle precast members to position, consistent with their shape and design. Lift and support only from support points. Lifting and handling equipment shall be capable of maintaining support of units during manufacture, storage, transportation, erection, and in position for fastening.

Blocking and lateral support during transport and storage shall be clean, non-staining, and not harmful to exposed surfaces. Provide temporary lateral support to prevent bowing and warping. Protect edges of members to prevent staining, chipping, or spalling of concrete.

C.4.3.2 Plank Installation

Verify acceptable bearing surfaces before plank placement. Masonry wall bearing surfaces require a solid top course.

Install precast concrete planks per approved shop drawings and details. Cooperate with other trades to permit inserting anchors, hangers, etc. Place hangers before units are grouted.

Erect units tight and at right angles to bearing surfaces unless shown otherwise. The minimum bearing is:

- On steel: 2-1/2 inches
- On concrete: 3 inches
- On masonry: 3-1/2 inches

Align and level precast concrete slabs using shims.

Weld inserts in slabs to bearing surfaces.

Use a grout mix consisting of one part Portland cement and 3 parts sand and water. Clean joints before grouting. Grout top surface joints and fill joints between units with grout. Remove grout that seeped through to surface below.

Show all openings created in precast units on site-maintained record drawings.

Protect members from damage caused by field welding or erection operations. Provide non-combustible shields during welding operations.

Seal bottom plank surface in finished areas. Seal joints at bearing and side walls. Seal joints between planks.

Patch planks with minor damage. Match color and texture of surrounding concrete.

C.4.3.3 Field Tolerances

Install precast concrete hollow core planks with the following field tolerances:

- Width of adjacent plank joints: plus or minus $\frac{1}{4}$ inch
- Joint taper: not more than $\frac{1}{4}$ inch total
- Offset between adjacent plank: $\frac{1}{4}$ inch maximum

C.4.4 Concrete Masonry Units

C.4.4.1 Preparation

Deliver masonry materials to project in undamaged condition. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.

Store cementitious materials off the ground, under cover, and in dry location. Store aggregates where grading and other required characteristics can be maintained and contamination avoided. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar, and soil that comes in contact with such masonry. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface. Protect sills, ledges, and projections from mortar droppings. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.

Do not lay masonry units, which are wet or frozen. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch. Remove all masonry damaged by freezing conditions.

Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperatures existing at time of installation except for grout. For grout, temperature ranges apply to anticipated minimum

night temperatures. In heating mortar and grout materials, maintain mixing temperature selected within 10°F.

- 40°F to 32°F:
 - Mortar: Heat mixing water to produce mortar temperature between 40°F and 120°F.
 - Grout: Follow normal masonry procedures.
- 32°F to 25°F:
 - Mortar: Heat mixing water and sand to produce mortar temperatures between 40°F and 120°F; maintain temperature of mortar on boards above freezing.
 - Grout: Heat grout materials to 90°F to produce in-place grout temperature of 70°F at end of workday.
- 25°F to 20°F:
 - Mortar: Heat mixing water and sand to produce mortar temperatures between 40°F and 120°F; maintain temperature of mortar on boards above freezing.
 - Grout: Heat grout materials to 90°F to produce in-place grout temperature of 70°F at end of workday.
 - Heat both sides of walls under construction using salamanders or other heat sources.
 - Use windbreaks or enclosures when wind is in excess of 15 mph.
- 20°F and below:
 - Mortar: Heat mixing water and sand to produce mortar temperatures between 40°F and 120°F; maintain temperature of mortar on boards above freezing.
 - Grout: Heat grout materials to 90°F to produce in-place grout temperature of 70°F at end of workday.
 - Masonry Units: Heat masonry units so that they are above 20°F at time of laying.
 - Provide enclosure and auxiliary heat to maintain an air temperature of at least 40°F for 24 hours after laying units.
 - Do not heat water for mortar and grout to above 160°F.

Protect completed masonry and masonry not being worked on in the following manner. Temperature ranges indicated apply to mean daily air temperatures except for grouted masonry. For grouted masonry temperature ranges apply to anticipated minimum night temperatures.

- 40°F to 32°F:
 - Protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.
- 32°F to 25°F:
 - Completely cover masonry with weather-resistive membrane for at least 24 hours.

- 25°F to 20°F:
 - Completely cover masonry with weather-resistive insulating blankets or similar protection for at least 24 hours, 48 hours for grouted masonry.
- 20°F and below:
 - Except as otherwise indicated, maintain masonry temperature above 32°F for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps or other methods proven to be satisfactory. For grouted masonry maintain heated enclosure to 40°F for 48 hours.

C.4.4.2 Unit Masonry Installation

Before placing, remove loose rust, ice and other coatings from reinforcing.

Build masonry construction to the full thickness shown, except build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness shown or specified.

For building chases and recesses as shown, provide not less than 8 inches of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.

Cut masonry units with a motor-driven, dry cutting saw designed to cut masonry with clean sharp unchipped edges. Cut units as required to provide the pattern shown on the plans and fit adjoining work neatly. Use full units without cutting wherever possible.

Set and build into work anchorage devices and other embedded items required for other work that is attached to or supported by unit masonry. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.

Install masonry units according to the following field tolerances:

- Variation from Plumb: For vertical lines and surfaces of columns, walls, and arises do not exceed 1/4" in 10 ft. or 3/8" in a story height not to exceed 20 ft., nor 1/2" in 40 ft. or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4" in any story or 20-ft. maximum, or 1/2" in 40 ft. or more. For vertical alignment of head joints do not exceed plus or minus 1/4" in 10 ft., 1/2" maximum.
- Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20 ft. maximum, nor 1/2" in 40 ft. or more. For top surface of bearing walls do not exceed 1/8" between adjacent floor elements in 10 ft. or 1/16" within width of a single unit.
- Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2" in any bay or 20 ft. maximum, nor 3/4" in 40 ft. or more.

- Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".
- Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

Do not use frozen materials or materials mixed or coated with ice or frost. For masonry, which is specified to be wetted, comply with the BIA recommendations. Do not build on frozen work. Remove and replace masonry work damaged by frost or freezing.

Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and properly locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half size units at corners, jambs and wherever possible at other locations.

Lay-up walls plumb and true and with courses level, accurately spaced and coordinated with other work.

Stopping and Resuming Work: Rake backs 1/2 masonry unit length in each course. Do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if specified to be wetted), and remove loose masonry units and mortar prior to laying fresh masonry.

As the work progresses, built-in items specified under this and other sections of these special provisions. Fill in solidly with masonry around built-in items.

- Set grilles and louvers.
- Fill space between hollow metal frames and masonry solidly with mortar.
- Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
- Fill concrete masonry unit cores with grout three courses (24 inches) under bearing plates, beams, lintels, posts and similar conditions unless otherwise indicated.

When intersecting load-bearing walls, if carried up separately, block vertical joint with 8" maximum offsets and provide rigid steel anchors spaced not more than 4'-0" o/c vertically, or omit blocking and provide rigid steel anchors at not more than 2'-0" o/c vertically. Form anchors or galvanized steel not less than 1-1/2" x 1/4" x 2'-0" long with ends turned up not less than 2" or with cross-pins. If used with hollow masonry units, embed ends in mortar filled cores.

At non-bearing interior partition walls, build full height of story to underside of solid structure above unless otherwise indicated. Provide 1" space between top of interior non-bearing masonry walls and metal deck or precast plank where steel joists or precast plank spans are 30 ft. or less; provide 2" space where such spans are greater than 30 feet.

Where steel joists run perpendicular through walls, provide 1" clearance between sides of joists and masonry.

Where non-load bearing partitions intersect load bearing walls, provide a 3/8" control joint between walls. Joint shall be free of mortar and suitable for installation of backer-rod and sealant.

Clean exposed concrete masonry unit masonry by dry brushing at the end of each day's work and after final pointing to remove mortar spots and droppings. Comply with recommendations in NCMA TEK Bulletin No. 45.

C.4.4.3 Mortar Bedding and Jointing

Lay brick and solid concrete masonry units with completely filled bed, head and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.

Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and foundation walls and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or to be filled with concrete or grout. For starting courses on footings where cells are not grouted, spread out full mortar bed including areas under cells.

Maintain joint widths shown, except for minor variations required maintaining bond alignment. Unless otherwise indicated, lay walls with 3/8-inch joints. Cut joints flush for masonry walls, which are to be concealed or to be covered by other materials. Unless noted otherwise, tool exposed joints slightly concave using a jointer larger than joint thickness. Rake out mortar in preparation for application of caulking or sealants where shown on the plans.

Remove masonry units disturbed after lying; clean and relay in fresh mortar. Do not pound corners at jambs to fit stretcher units, which have been set in position. If adjustments are required, remove units, clean off mortar, and reset in fresh mortar.

C.4.4.4 Cavity Walls

All exterior walls shall be of the cavity type. Erect cavity type walls with thickness of materials as indicated on the plans. All interior wythes shall be constructed first, at least one block course ahead of the outer wythe. Bond the wythes together with continuous cavity wall ties as specified. Individual cavity wall ties in addition shall be positioned within 8" of the jambs of the openings, except where the wythes are bonded together with masonry returns at jambs.

On units of rigid insulation, install small pads of adhesive spaced approximately 1'-0" o/c both ways on inside face or attach to inside face with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown. Fill all cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

Special precautions must be taken to achieve smooth faces on the inside of the cavity space and to ensure that the bottom of the cavity is clean and free of mortar droppings.

- Use a smooth mortar bed for the exterior wythe and bevel the mortar joint away from the cavity so that a smooth upper surface inclined down toward the cavity results. Trowel flat and smooth any mortar fins on the cavity face of either wythe, which may result.
- To prevent mortar from dropping to the bottom of the cavity, use temporary wood, metal or fiber strips laid on the continuous wall reinforcing and carefully lift them out as the work progresses before the next layer of reinforcement is placed.
- Provide sufficient holes in cavity to permit visual inspection and all necessary cleaning out of mortar droppings at the base and intermediate support of all cavity walls. As a minimum, every third masonry unit in one wythe of the wall shall be left out at the bottom. The cavity shall be inspected and cleaned out at least twice a day during construction of the wall. The inspection and clean out openings shall be sealed only after the cavity is covered above by other construction and the engineer has subsequently inspected the cavity.

C.4.4.5 Weep Holes

Provide weep holes in exterior wythe of cavity walls located immediately above ledges and flashing, spaced no more than 48" o/c, unless otherwise indicated. Weep holes shall be the full joint width. Create weep holes by placing 3/8" round x 4" long medium density polyethylene plastic tubes in mortar bed.

C.4.4.6 Horizontal Joint Reinforcing

Provide continuous horizontal joint reinforcing as shown on the plans and specified herein. Fully embed longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls and 1/2" at other locations. Lap reinforcement a minimum of 6" at ends of units. Do not bridge control and expansion joints with reinforcing, unless otherwise indicated. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend units as directed by the manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.

Space continuous horizontal joint reinforcing in every second block joint or 16" o/c in all exterior and interior bearing walls, and in every third block joint or 24" o/c in all interior non-bearing walls. For all parapets and immediately above and below openings, space reinforcing at 8" o/c vertically.

Reinforce masonry openings greater than 1-foot wide, with horizontal joint reinforcing placed in two horizontal joints approximately 8" apart, both immediately above the lintel and below the sill. Extend reinforcing a minimum of 2 feet beyond jambs of the openings, bridging control joints where provided.

C.4.4.7 Anchoring Masonry Work

Provide anchoring devices of the type indicated on the plans. If not indicated, provide standard type for facing, and back-up involved. Anchor masonry to structural members where masonry abuts or faces such members to comply with the following:

- Provide an open space not less than 1" in width between masonry and structural member, unless otherwise shown. Keep open space free of mortar or other rigid materials.
- Anchor masonry to structural members with metal ties embedded in masonry joints and attached to structure.
- Provide anchors with flexible tie sections, unless otherwise indicated.
- Space anchors as shown but not more than 24" o/c vertically and 36" o/c horizontally.

Anchor single wythe masonry veneer to structural members with metal anchors embedded in masonry joints and attached to structure. Provide anchors with flexible tie section, unless otherwise indicated.

C.4.4.8 Lintels

Install loose lintels of steel and other materials where shown on the plans.

Provide masonry lintels where shown on the plans and wherever openings of more than one foot are shown without structural steel or other supporting lintels. For hollow concrete masonry unit walls, use specially formed "U"-shaped lintel units with reinforcing bars placed as shown on the plans and filled with grout of consistency required to completely fill space between reinforcing bars and masonry unit.

Provide minimum bearing of 8" at each jamb, unless otherwise indicated.

C.4.4.9 Expansion Joints

Provide vertical expansion, control and isolation joints in masonry where shown on the plans. Build in related masonry accessory items as the masonry work progresses.

C.4.4.10 Flashing of Masonry Work

Provide concealed flashings; in masonry work at, or above, all shelf angles, lintels, ledges and other obstructions to the downward flow of water in the wall so as to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections, which could puncture flashing. Place through-wall flashing on sloping bed or mortar and cover with mortar. Seal penetrations in flashing with mastic before covering with mortar. Extend flashings through exterior face of masonry and turn down to form drip.

- Extend flashings the full length of lintels and shelf angles and minimum of 4" into masonry each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4", and through the inner wythe, to within 1/2" of the interior face of the wall in exposed work. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2". At heads and sills turn up ends not less than 2" to form a pan.

- Provide weep holes in the head joints of the same course of masonry bedded in flashing mortar.
- Interlock end joints of deformed metal flashings by overlapping deformations not less than 1-1/2" and seal lap with elastic sealant.
- Install flashings in accordance with manufacturer's instructions.

Install reglets and nailers for flashing and other related work where shown to be built in masonry work. Pour clean, dry sand into cavities to completely fill void spaces at all walls scheduled to have sand filled cores.

C.4.4.11 Parging

Parge predampened masonry walls with Type S or N mortar applied in two uniform coats to a total thickness of 3/4". Scarify first parging coat to ensure full bond to subsequent coat. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8" per foot. Form a wash at top of parging and a cove at bottom. Damp cure parging for at least 24 hours and protect until cured.

Parge all block walls which are in contact with earth and where the floor is below grade. Parge from thru wall flashing line to 16" below finish floor line.

C.4.5 Clear Sealer

Apply one coat of clear sealer to the Bins building structure and cast in place concrete walls and floors as shown in the room finish schedule on the plans. Do not apply sealer to exterior concrete walls that are to be stained. Perform work in accordance to Section C.5.5 Paint.

C.4.6 Formliner

Supply reusable form liner having a smooth, horizontal brick pattern with round joints. Clean the form liner prior to each pour and ensure that it is free of any build-up. Visually inspect each liner for blemishes or tears, and repair if necessary per manufacturer's recommendations.

Place the formliner on the outside wall faces of Storage Building 1 and Storage Building 2 as indicated on the plans. The smooth, horizontal brick pattern shall extend a minimum of 6" below finished grade.

Apply form release agent per manufacturer's recommendations.

Attach liner securely to forms in accordance with manufacturer's recommendations to maintain a continuous smooth, horizontal brick pattern with round joints. Coordinate wall ties with form liner and form manufacturer, e.g., diameter, size, and frequency where applicable.

Grind or fill pouring blemishes.

C.4.7 Concrete Staining

C.4.7.1 Preparation of Concrete Surfaces

Match or exceed the stain manufacturer's minimum recommended curing time of the concrete or 28 days, whichever is greater before applying base color stain.

Prior to staining, make sure all areas to be stained are clean and dry.

C.4.7.2 Staining Concrete Surfaces

Furnish, prepare, apply, cure and store all materials according to product manufacture directions specified for the type and condition of application required.

Apply the stain in strict conformance with product manufacture requirements.

Apply the concrete stain when the temperature of the concrete surface is 45 degrees F or higher, or as specified by the manufacturer.

The final color of the concrete following application of the stain system shall match the fascia brick color for Storage Building 2 and the approved City of Wauwatosa Design Review Board sample.

Do not begin the staining until adjacent operations are completed to a point where this work can begin without receiving damage or blowing dust. Where this work is adjacent to exposed paved areas, provide temporary covering protection from overspray or splatter.

C.4.7.3 Surfaces to be Coated

Apply the stain to the smooth brick face concrete walls of Storage Building 1 and Storage Building 2. Stain only the outside vertical face of the concrete walls as shown on the plans. Do not apply stain to the mortar lines and any horizontal surfaces.

C.4.8 Test Panel

At least 15 working days prior to the start of forming the concrete walls, prepare and deliver to the field office a 4-foot by 4-foot concrete test panel. Cast the test panel with the proposed formliner and apply stain using the same materials and in the same method as proposed for the concrete walls. The pattern, final color, and finish shall match the City of Wauwatosa Design Review Board samples and are to be approved by the engineer prior to placement of any concrete or stain in the field.

Additionally, the engineer will evaluate the stain application and color, the adequacy of the product, and the forming methods to yield the desired results. The engineer shall inspect condition of the test panel and its dimensional quality. All voids and irregularities shall be repaired using the same methods as on the final concrete walls. The engineer will evaluate the test panel for definition and consistency. If the test panel is accepted the workmanship becomes the standard for the balance of the contractors work and incorporation into the final concrete walls.

If the test panel is not accepted, the contractor shall prepare another test panel and repeat the process, using either a different product or different methods. This procedure shall be repeated until the test panel is accepted by the engineer.

C.5 Building Materials

C.5.1 General

Install all materials as shown on the plans and as specified herein per applicable codes.

C.5.2 Fascia Brick

Install bricks in a horizontal pattern at locations shown on the plan for Storage Building 2. Perform work in accordance to the applicable provisions of Section C.4.4 Concrete Masonry Units.

Clean exposed brick masonry surfaces by the bucket and brush hand cleaning method or by the high-pressure water method. Comply with requirements of BIA Technical Notes No. 20 Revised "Cleaning Brick Masonry."

Remove excess grout and protect adjacent surfaces from damage.

C.5.3 Insulation

C.5.3.1 General

Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside in a dry location. Comply with manufacturer's recommendations for handling, storage, and protection during installation.

Protect insulation materials as follows:

- Do not expose to sunlight, except to extent necessary for period of installation and concealment.
- Protect against ignition at all times. Do not deliver plastic insulating materials to project site ahead of installation time.
- Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

Examine substrates and condition for compliance with requirements of the sections in which substrates and related work are specified and determine if other conditions affecting performance of insulation are satisfactory. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

Clean substrates of substances harmful to insulation.

Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.

Install general building insulation as shown on the plans and as required to assure a well-insulated project. Apply insulation to substrate by mechanical anchorage as recommended by manufacturer to provide permanent placement and support of units.

Protect installed insulation and vapor retarders from harmful weather exposures and from possible physical abuses, where possible by nondelayed installation of concealing work or, where that is not possible, by temporary covering or enclosure. Advise the engineer of exposure hazards, including possible sources of deterioration and fire hazards.

C.5.3.1.1 Mineral Fiber Blanket Insulation

Stuff unfaced glass fiber insulation into the spaces between the tops of walls and roof decking, where joists run perpendicular through walls and into miscellaneous voids and cavity spaces as indicated. Compact insulation to approximately 40% of normal maximum volume to a density of approximately 2.5 lbs per cubic foot.

C.5.3.1.2 Vapor Barrier (Retarder) Insulation

Extend vapor retarder to extremities of areas to be protected from vapor and moisture transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates including those which have been stuffed with loose fiber-type insulation.

Seal joints in vapor retarders over framing by lapping not less than two rigid insulation wall furring channels. Fasten vapor retarders to framing at all edges, at perimeter of openings and at lap joints.

Firmly attach vapor retarders to substrates with mechanical fasteners or adhesives as recommended by vapor retarder manufacturer.

Seal joints caused by pipes, conduits, electrical boxes and similar items penetrating vapor retarders with cloth or aluminized tape of type recommended by vapor retarder manufacturer to create an air-tight seal between penetrating objects and vapor retarder.

Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with tape or another layer of vapor retarder.

C.5.3.2 Board Insulation

Verify substrate and adjacent materials and insulation boards are dry and ready to receive insulation and adhesive. Verify substrate surface is flat, free of honeycomb, fins, irregularities, and materials that will impede adhesive bond. Verify insulation boards are unbroken and free of damage with the face membrane undamaged.

C.5.3.2.1 Foundation Perimeter Installation

Apply adhesive in three continuous beads per board length, 1/8 inch thick. Install boards on foundation wall perimeter, vertically. Place boards in a method to maximum contact bedding. Stagger end joints. Butt edges and ends tight to adjacent board and to protrusions. Protect board from damage during backfill operation.

C.5.3.2.2 Exterior Wall Installation

Install 2-inch insulation board between brick and block as detailed on the plans. Fill all masonry blocks in the outside walls with expanded polystyrene insulation.

C.5.3.3 Foamed in Place Masonry Insulation

Examine walls and cavities to determine if conditions would adversely affect performance of insulation. Walls to be insulated must be free of moisture inside and outside of block. Do not inject insulation into wet walls.

Notify engineer at least 24 hours before installation date.

Install in accordance to the manufacturer's recommendations. Fill open cells and voids in designated walls. Install using drill, fill, and patch method. Provide holes near bottom and top of each vertical line of unit cavities. Patch and tuckpoint holes with mortar.

Protect installed insulation from water for 24 hours after installation.

Do not paint walls for 14 days after installing insulation.

C.5.4 Hardware

Provide the engineer with manufacturer's parts list and maintenance instructions for each type of hardware supplied and necessary wrenches and tools required for proper maintenance of hardware.

Install hardware in accordance with manufacturer's recommendations using proper templates.

C.5.5 Paint

C.5.5.1 Preparation

Deliver paint materials in sealed original labeled containers, bearing manufacturer's name, type of paint, brand name, color designation and instructions for mixing and/or reducing. Provide adequate storage facilities. Store paint materials at minimum ambient temperature of 45 degrees F in a well ventilated area. Take precautionary measures to prevent fire hazards and spontaneous combustions.

Use an electronic moisture meter to measure moisture content of surfaces. Do not apply finishes unless moisture contents of surfaces are below following maximums:

- Plaster and gypsum wallboard: 12 percent
- Masonry, concrete and concrete block: 12 percent
- Interior located wood: 15 percent

Ensure surface temperatures and the surrounding air temperature is above 50 degrees F before applying finishes. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above 50 degrees F for 24 hours before, during and 48

hours after application of finishes. Provide minimum 25-foot candles of lighting on surfaces to be finished.

Thoroughly examine surfaces scheduled to be painted prior to commencement of work. Notify the engineer of any condition that may potentially affect proper application. Do not commence until such defects have been corrected. Correct defects and deficiencies in surfaces which may adversely affect work of this section.

Protect other surfaces from paint and damage. Repair damage as a result of inadequate or unsuitable protection. Furnish drop cloths, shield, and protective equipment to prevent spray or droppings from fouling surfaces not being painted and in particular, surfaces within storage and preparation areas.

Place cotton waste, cloths, and materials which may constitute a fire hazard in closed metal containers and remove daily from site.

Remove electrical plates, surface hardware, fittings and fastenings, prior to painting operations. These items are to be carefully stored, cleaned, and replaced on completion of work in each area. Do not use solvent to clean hardware that may remove permanent lacquer finish.

Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry completely.

Remove surface contamination from aluminum surfaces requiring a paint finish by steam, high-pressure water or solvent washing. Apply etching primer or acid etch. Apply paint immediately if acid etching.

Remove dirt, powdery residue and foreign matter from asbestos-cement, board, siding, piping, and shingles. Paint both sides immediately when applicable.

Remove dirt, oil, grease and sand if necessary to provide adhesion key, when asphalt, creosote or bituminous surfaces require a paint finish. Apply latex based, compatible sealer or primer.

Remove dirt, grease and oil from canvas and cotton insulated coverings.

Remove contamination, acid etch and rinse new concrete floors with clear water. Ensure required acid-alkali balance is achieved. Allow to thoroughly dry.

Remove contamination from copper surfaces requiring paint finish by steam, high-pressure water or solvent washing. Apply vinyl etch primer or acid etch. Apply paint immediately if acid etching.

Remove contamination from copper surfaces required to be oxidized. Apply oxidizing solution of copper acetate and ammonium chloride in acetic acid. Rub on repeatedly for correct effect. Once attained, rinse surfaces well with clear water and allow to dry.

Remove surface contamination and oils from galvanized surfaces and wash with solvent. Apply coat of etching type primer.

Remove surface contamination and oils from zinc coated surfaces and prepare for priming in accordance with metal manufacturer's recommendations.

Remove dirt, loose mortar, scale, powder and other foreign matter from concrete and concrete block surfaces which are to be painted or to receive a clear seal. Remove oil and grease with a solution of non-hydrocarbon solvent, rinse well and allow to thoroughly dry.

Remove stains from concrete and concrete block surfaces caused by weathering of corroding metals with a solution of sodium metasilicate after being thoroughly wetted with water. Allow to thoroughly dry.

Fill hairline cracks, small holes and imperfections on plaster surfaces with patching plaster. Smooth off to match adjacent surfaces. Wash and neutralize high alkali surfaces where they occur.

Remove grease, rust, scale, dirt and dust from steel and iron surfaces. Remove heavy coatings of scale by wire brushing, sandblasting or any other necessary method. Ensure steel surfaces are satisfactory before paint finishing.

Clean unprimed steel surfaces by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Prime surfaces to indicate defects, if any. Paint after defects have been remedied.

Sand and scrape shop primed steel surfaces to remove loose primer and rust. Feather out edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Prime steel including shop primed steels.

Prior to finishing glue laminated beams, wash down surfaces with solvent and remove grease and dirt.

C.5.5.2 Application

Apply each coat per Section B.5.5.1 at proper consistency. Each coat of paint is to be slightly darker than preceding coat. Sand lightly between coats to achieve required finish. Do not apply finishes on surfaces that are not sufficiently dry. Allow each coat of finish to dry before following coat is applied, unless directed otherwise by manufacturer. Where clear finishes are required, ensure tint fillers matchwood. Work fillers well into the grain before set. Wipe excess from the surface. Prime top and bottom edges of wood and metal doors with enamel undercoat when they are to be painted.

As work proceeds and upon completion, promptly remove paint where spilled, splashed or spattered. During progress of work keep, premises free from any unnecessary accumulation of tools, equipment, surplus materials and debris. Upon completion of work, leave premises neat and clean to the satisfaction of the engineer.

As directed by the engineer, leave on premises approximately one gallon of each color used. Containers shall be tightly sealed and clearly labeled for identification.

C.5.5.3 Mechanical and Electrical Equipment

Painting and finishing requirements, color-coding, identification banding of equipment, ducting, piping and conduit shall be in conformance with NR 811.32(6). Remove grilles, covers and access panels for mechanical and electrical systems from location and paint separately. Prime and paint insulated and bare pipes, conduits, boxes, insulated and bare ducts, hangers, brackets, collars and supports, except where items are plated or covered with a pre-finished coating.

Replace identification markings on mechanical or electrical equipment when painted over or spattered.

Paint interior surfaces of air ducts, convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to limit of sight line. Paint dampers exposed immediately behind louvers, grilles, convector and baseboard cabinets to match face panels.

Paint exposed conduit and electrical equipment occurring in finished areas. Match the color and texture to adjacent surfaces. Paint both sides and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.

Color-code equipment, piping, conduit and exposed ductwork in accordance with requirements indicated. Color banding and identification shall include flow arrows, naming, numbering, etc.

C.5.5.4 Structural Steel

C.5.5.4.1 Shop Painting

All structural steel except where galvanized shall be given one shop coat of primer with a minimum thickness of 2.0 mils compatible with the finish coats provided in Section B.5.5 Paint, after fabrication and cleaning but before shipping.

All steel work shall be thoroughly cleaned, by sandblasting in accordance to Steel Structures Painting Council Specification SP-6 before shop painting. Paint shall be applied immediately after blast cleaning, thoroughly and evenly and well worked into joints and other open spaces. Paint shall be applied only to dry surfaces. Primer shall be compatible with finish coat as specified in Section B5.5 Paint.

C.5.5.4.2 Field Painting

After erection, thoroughly clean the entire structural steel surface of all dirt, grease, rust, welding slag, or other foreign matter. Touch up affected areas as specified herein.

C.5.6 Caulk

Clean, prepare, and size joints in accordance with manufacturer's instructions. Remove any loose materials and other foreign matter, which might impair adhesion of sealant. Verify that joint shaping materials and release tapes are compatible with sealant. Examine joint dimensions and size materials to achieve required width/depth ratios. Use joint filler to achieve required joint depths, to allow sealants to perform properly. Use bond breaker where required.

Set joint filler units at proper depth or position in joint to coordinate with other work, including installation of bond breakers, backer rods and sealants. Do not leave voids or gaps between ends of joint filler units. Install sealant backer rod for liquid elastomeric sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for application indicated. Install bond breaker tape where indicated and where required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.

Employ only proven installation techniques, which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of the joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

Install sealants to depths as shown or if not shown, as recommended by the sealant manufacturer but within the following general limitations, measured at center (thin) section of bed.

Install One-Component DyMonic Sealant in following joints:

- Between metal door, window frames and exterior masonry
- All other joints in exterior walls and where dissimilar materials butt
- Provide backer rod, joint filler and bond breaker tape as required

Install Three-Component Epoxidized Polyurethane Sealant in the following joints:

- Exterior wall control joints
- Exterior wall expansion joints
- Provide backer rod, joint filler and bond breaker type as required

Install Acrylic-Latex Sealant in following interior joints:

- Between metal frames and masonry walls and partitions
- Interior wall expansion and control joints where joint covers are not called for

C.6 Metal Siding and Ceiling

C.6.1 Preparation

Verify actual measurements and openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Identify fabricated components with UL 90 label where appropriate. Bundle panels in waterproof wrapping paper when nested, or wooden crates when panels cannot be nested. Package trim and accessories in waterproof wrapping paper.

Store materials protected from exposure to harmful conditions. Store materials in manufacturer's unopened packaging until installation of products. Stack prefinished material to prevent twisting, bending, abrasion, scratching and denting. Elevate one end of each skid to allow for moisture run off. Maintain dry, heated storage area for materials until installation of products.

Verify panel support systems are ready for construction activities and within specified tolerances. Verify that rough-in utilities are in correct locations. Coordinate metal siding and ceiling installation with other work including drainage, flashing and trim, deck substrates, parapets, copings, walls and other adjoining work to provide a noncorrosive and leakproof installation. Prevent galvanic action of dissimilar metals.

C.6.2 Installation

Comply with manufacturer's product data, recommendations and installation instructions. Remove manufacturer's protective film, if any, from surfaces of siding and ceiling panels. Install metal siding and ceiling panels to profiles, patterns and drainage indicated and required for leakproof installation. Provide for structural and thermal movement of work.

Seal joints for leakproof installation. Provide uniform, neat seams. Conceal fasteners where possible in exposed work. Cover and seal fasteners and anchors for watertight and leakproof installation. Provide sealant-type joint where indicated. Form joints to conceal sealant.

Install panels plumb, true and in correct alignment with structural framing, in accordance with shop drawings and manufacturer's printed installation instructions. Install panels in horizontal installations using manufacturer's concealed fastening system only; sight-exposed fasteners are prohibited. Install trim using concealed fasteners where possible; sight-exposed non-corroding fasteners color-matched to trim are permitted on vertical surfaces only.

Installation tolerances for panels shall conform to the following requirements:

- Variation from Plumb: Maximum 1/8" in 20 feet.
- Variation from Level: Maximum 1/8" in 20 feet.
- Variation from True Plane: Maximum 1/8" in 20 feet.

The engineer reserves the right to perform post-installation testing of installed metal panels.

Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions. Remove strippable coating and perform dry wipe-down cleaning of panels as erected.

Protect installed products from damage by subsequent construction activities. Replace products having damage other than minor finish damage. Repair products having minor damage to finish in accordance with panel manufacturer's recommendations. The engineer shall be sole judge of acceptability of repair to damaged finishes; replace products having rejected repairs.

C.7 Roofing

C.7.1 Elastomeric Sheet Roofing

Prior to installation, store materials in weather-protected environment clear of ground and moisture. Protect foam insulation board from direct sunlight exposure.

Verify that the roof surface is clean and smooth; free of depressions, waves, or projections; and properly sloped. Verify roof openings and penetrating elements through roof are solidly set and in place. Do not apply roofing materials to damp, frozen, dirty, dusty or surfaces unacceptable to manufacturer.

Make completed roofing system wind and weather tight. Maximum joint openings between insulation and walls and penetrations shall be ¼ inch. Tightly butt other joints, but do not force. Stagger joints (both directions) between layers. Neatly cut and fit insulation to roof penetrations, projections and nailers. Uniformly slope tapered insulations for drainage. Lay saddle overlays to provide a minimum ½ inch per foot pitch from high point to low point. Do not lay more insulation than can be covered with roofing membrane before end of day's work or before onset of inclement weather. Do not install cracked, broken or damaged sheets. Remove and replace damaged sheets.

Single ply roof membrane shall be loose laid. Position single-ply membrane over area to be roofed without stretching. Install sheet with a minimum amount of field splices. Allow membrane to relax ½ hour before splicing and flashing. Membrane and flashing shall be cleaned, lapped and spliced to adjoining sheets and applied following membrane manufacturer's instructions. Terminate membrane with a perimeter fastener strip. Carry membrane over top and 1-½ inches past wood blocking and fully bond to finish material substrate. Clamp membrane down into roof drains. Apply ballast.

Totally bond flashings. Space fasteners as detailed and required to maintain constant compression. Flash soil and vent stacks following manufacturer's instructions using prefabricated units. Seal top edge of flashing with lap sealant or caulking, or cover with metal counterflashing.

Follow membrane manufacturer's standards for roof projections.

Do not expose materials vulnerable to water or sun damage in quantities greater than that which can be weatherproofed during same day.

Protect finished installation.

C.7.2 Metal Roofing

C.7.2.1 Preparation

Verify actual measurements and openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Identify fabricated components with UL 90 label where appropriate. Bundle panels in waterproof wrapping paper. Package trim and accessories in waterproof wrapping paper.

Store materials protected from exposure to harmful conditions. Store materials in manufacturer's unopened packaging until installation of products. Stack prefinished material to prevent twisting, bending, abrasion, scratching and denting. Elevate one end of each skid to allow for moisture run off. Maintain dry, heated storage area for materials until installation of products.

Verify panel support systems are ready for construction activities and within specified tolerances. Verify that rough-in utilities are in correct locations. Coordinate metal roof installation with other adjoining work to provide a noncorrosive and leakproof installation. Prevent galvanic action of dissimilar metals.

C.7.2.2 Installation

Comply with manufacturer's product data, recommendations and installation instructions. Remove manufacturer's protective film, if any, from surfaces of roofing panels. Install metal roofing panels to profiles, patterns and drainage indicated and required for leakproof installation. Provide for structural and thermal movement of work.

Seal joints for leakproof installation. Provide uniform, neat seams. Conceal fasteners where possible in exposed work. Cover and seal fasteners and anchors for watertight and leakproof installation. Provide sealant-type joint where indicated. Form joints to conceal sealant.

Install roofing plumb, true and in correct alignment with structural framing, in accordance with shop drawings and manufacturer's printed installation instructions. Install roofing using manufacturer's concealed fastening system or non-corroding fasteners color-

matched to panel. Install trim using concealed fasteners where possible; sight-exposed non-corroding fasteners color-matched to trim are permitted on vertical surfaces only.

Installation tolerances for panels shall conform to the following requirements:

- Variation from Plumb: Maximum 1/8".
- Variation from Level: Maximum 1/8".
- Variation from True Plane: Maximum 1/8".
- Variation from True Position: Maximum 1/4".
- Variation of Member from Plane: Maximum 1/8".

The engineer reserves the right to perform post-installation testing of installed metal panels.

Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions. Remove strippable coating and perform dry wipe-down cleaning of panels as erected.

Protect installed products from damage by subsequent construction activities. Replace products having damage other than minor finish damage. Repair products having minor damage to finish in accordance with panel manufacturer's recommendations. The engineer shall be sole judge of acceptability of repair to damaged finishes; replace products having rejected repairs.

C.8 Mechanical

C.8.1 General

Perform all mechanical work per applicable codes. The work shall be inspected and approved by the local building department. Install all mechanical work as shown on the plans and as specified herein.

C.8.1.1 Access and Coordination

Arrange for the necessary openings in the building to allow for admittance of all apparatus. When the building access was not previously arranged and must be provided, restore any opening to its original condition after the apparatus has been brought into the building.

Install all piping, conduit and accessories to permit access to equipment for maintenance and service. Provide color coded thumb tacks or screws, depending on the surface, for use in accessible ceilings which do not require access panels.

Verify that all devices are compatible for the surfaces on which they will be used. This includes, but is not limited to, diffusers, register, grilles, and recessed or semi recessed heating and/or cooling terminal units installed in/on architectural surfaces.

C.8.1.2 HVAC Identification

Identify equipment in mechanical equipment rooms by stenciling equipment number and service with one coat of black enamel against a light background or white enamel against a

dark background. Use a primer where necessary for proper paint adhesion. Do not label equipment such as cabinet heaters and ceiling fans in occupied spaces. Where stenciling is not appropriate for equipment identification, engraved name plates may be used.

Identify piping not less than once every 30 feet, not less than once in each room, adjacent to each access door or panel, and on both side of the partition where exposed piping passes through walls, floors or roofs. Place flow directional arrows at each pipe identification location. Use one coat of black enamel against a light background or white enamel against a dark background for stenciling, or provide snap-on pipe markers as specified in Section B.8.

Identify valves with brass tags bearing a system identification and a valve sequence number. Valve tags are not required at a terminal device unless the valves are greater than ten feet from the device or located in another room not visible from the terminal unit. Provide a typewritten valve schedule indicating the valve number and the equipment or areas supplied by each valve. Locate schedules in each mechanical room and in each Operating and Maintenance manual. Schedules in mechanical rooms shall be framed under clear plastic.

Use engraved name plates to identify control equipment.

C.8.1.3 Lubrication

Lubricate all bearings with lubricant as recommended by the manufacturer before the equipment is operated for any reason. Once the equipment has been run, maintain lubrication in accordance with the manufacturer's instructions until the work is accepted by the department. Maintain a log of all lubricants used and frequency of lubrication; include this information in the operating and maintenance manuals at the completion of the project.

C.8.1.4 Sleeves

Provide galvanized sheet metal sleeves for pipe penetrations through interior and exterior walls to provide a backing for sealant or firestopping. Patch wall around sleeve to match adjacent wall construction and finish. Grout area around sleeve in masonry construction. In finished spaces where pipe penetration through wall is exposed to view, sheet metal sleeve shall be installed flush with face of wall.

Pipe sleeves in new poured concrete construction shall be schedule 40 steel pipe sized to allow insulated pipe to run through sleeve and cast in place.

Extend the top of sleeve 1 inch above the adjacent floor in piping floor penetrations located in the mechanical rooms. In finished areas, sleeves shall be flush with rough floor.

Duct sleeves are not required in non-rated partitions or floors.

Install sleeve required for fire dampers in fire-rated partitions and floors.

For duct penetrations through mechanical room floors, provide 1-1/2"x 1-1/2" x 1/8" galvanized steel angles fastened to floor around the perimeter of the duct opening to prevent water from getting to floor opening. Provide urethane caulk between angles and floor and fasten angles to floor 8" on center. Seal corners water tight with urethane caulk.

C.8.1.5 Sealing and Firestopping

For fire and/or smoke rated penetrations, install approved product in accordance with the manufacturer's instructions where pipes penetrate a fire/smoke rated surface. When pipe is insulated, use a product which maintains the integrity of the insulation and vapor barrier. Where firestop mortar is used to infill large fire-rated floor openings that could be required to support weight, provide permanent structural forming. Firestop mortar alone is not adequate to support substantial weight.

For non-rated partitions in exterior wall openings below grade, assemble rubber links of mechanical seal to the proper size for the pipe and tighten in place in accordance with the manufacturer's instructions.

For non-rated partitions at all interior partitions and exterior walls, pipe penetrations are required to be sealed. Apply sealant to both sides of the penetration in such a manner that the annular space between the pipe sleeve or cored opening and the pipe or insulation is completely blocked.

Duct penetrations through non-rated partitions shall require sheet metal escutcheons with fiberglass or mineral wool insulation fill for spaces that include laboratories, clean rooms, animal rooms, kitchens, cart wash rooms, janitor closets, cart wash rooms, toilet rooms, mechanical rooms, conference rooms, private consultation rooms, and where noted elsewhere on the plans.

C.8.1.6 Welder Qualifications

Before any metallic welding is performed, submit the Standard Welding Procedure Specification together with the Procedure Qualification Record as required by Section IX of the ASME Boiler and Pressure Vessel Code and/or the National Certified Pipe Welding Bureau. Welder certifications are required to be renewed every three years. Provide current certification paperwork at the request of the engineer.

Before any polyethylene fusion welding is performed, submit certification that the welders to be used on this project have successfully demonstrated proper welding procedures in accordance with the Code of Federal Regulations, Title 49, Part 192, Section 192.285.

The engineer reserves the right to test the work of any welder employed on the project, at the department's expense. If the work of the welder is found to be unsatisfactory, the welder shall be prevented from doing further welding on the project and all defective welds shall be replaced at the contractor's expense.

C.8.2 Motors for HVAC Equipment

Mount motors on a rigid base designed to accept a motor, using shims if required under each mounting foot to get a secure installation.

When motor will be flexible coupled to the driven device, mount coupling to the shafts in accordance with the coupling manufacturer's recommendations. Using a dial indicator, check angular misalignment of the two shafts and adjust motor position as necessary so that the angular misalignment of the shafts does not exceed 0.002 inches per inch diameter of the coupling hub. Again using the dial indicator, check the shaft for run-out to assure concentricity of the shafts; adjust as necessary so that run-out does not exceed 0.002 inch.

When motor will be connected to the driven device by means of a belt drive, mount sheaves on the appropriate shafts in accordance with the manufacturer's instructions. Use a straight edge to check alignment of the sheaves and reposition sheaves as necessary so that the straight edge contacts both sheave faces squarely. After sheaves are aligned, loosen the adjustable motor base so that the belt(s) can be added and tighten the base so that the belt tension is in accordance with the drive manufacturer's recommendations. Frequently recheck belt tension and adjust if necessary during the first day of operation and again after 80 hours of operation.

Verify the proper rotation of each three-phase motor as it is being wired or before the motor is energized for any reason.

Lubricate all motors requiring lubrication. Record lubrication material used and the frequency of use. Include this information in the maintenance manuals.

C.8.3 Valves for HVAC Piping

Properly align piping before installation of valves in an upright position. Operators installed below the valves will not be accepted. Install valves in strict accordance with valve manufacturer's installation recommendations. Do not support weight of piping system on valve ends.

Install all valves with the stem in the upright position. Valves may be installed with the stem in the horizontal position only where space limitations do not allow installation in an upright position or where large valves are provided with chain wheel operators. Where valves 2-1/2" and larger are located more than 12'-0" above mechanical room floors, install valve with stem in the horizontal position and provide a chain wheel operator. Valves installed with the stems down, will not be accepted.

Install stem extensions when shipped loose from valve.

Prior to flushing of piping systems, place all valves in the full-open position.

Install shut-off valves at all equipment, at each branch take-off from mains, and at each automatic valve for isolation or repair.

When the gas pressure regulator is equipped with a vent connection, run a connection size vent to outside air in accordance with codes. Use a larger size vent when required by the manufacturer's installation instructions.

C.8.4 Hangers and Supports for HVAC Piping and Equipment

C.8.4.1 Installation

Install supports to provide for free expansion of the piping and duct system. Support all piping from the structure using concrete inserts, beam clamps, ceiling plates, wall brackets, or floor stands. Fasten ceiling plates and wall brackets securely to the structure and test to demonstrate the adequacy of the fastening.

Coordinate hanger and support installation to properly group piping of all trades.

Where piping can be conveniently grouped to allow the use of trapeze type supports, use standard structural shapes or continuous insert channels for the supporting steel. Where continuous insert channels are used, pipe supporting devices made specifically for use with the channels may be substituted for the specified supporting devices provided that similar types are used and all data is submitted for prior approval by the engineer.

Perform all welding in accordance with standards of the American Welding Society. Clean surfaces of loose scale, rust, paint or other foreign matter and properly align before welding. Use wire brush on welds after welding. Welds shall show uniform section, smoothness of weld metal and freedom from porosity and clinkers. Where necessary to achieve smooth connections, joints shall be dressed smooth.

C.8.4.2 Hanger and Support Spacing

Place a hanger within 12 inches of each horizontal elbow, valve, strainer, or similar piping specialty item. Where several pipes can be installed in parallel and at the same elevation, provide multiple or trapeze hangers. Support riser piping independently of connected horizontal piping. Adjust hangers to obtain the slope specified in the piping section of this specification.

Space hangers for pipe as follows:

<u>Pipe Material</u>	<u>Pipe Size</u>	<u>Max. Spacing</u>
Steel	1/2" through 1-1/4"	6'-6"
Steel	1-1/2" through 6"	10'-0"

C.8.4.3 Vertical Riser Clamps

Support vertical piping with clamps secured to the piping and resting on the building structure or secured to the building structure below at each floor. Piping 5 inches and above, of lengths exceeding 30 feet, shall be additionally supported on base elbows secured to the building structure, with flexible supporting hangers provided at top of riser to allow for pipe expansion.

C.8.5 Building Facility Fuel Piping

C.8.5.1 General

Promptly inspect shipments to insure that the material is undamaged and complies with the specifications. Cover pipe to prevent rust and corrosion while allowing sufficient ventilation to avoid condensation. Do not store materials directly on grade. Protect pipe, tube, and fitting ends so they are not damaged. Where end caps are provided or specified, take precautions so the caps remain in place. Offsite storage agreements will not relieve the contractor from using proper storage techniques. Storage and protection methods must allow inspection to verify products.

Remove all foreign material from interior and exterior of pipe and fittings.

Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute piping as required to clear such interferences. In all cases, consult the plans for exact location of pipe spaces, ceiling heights, door and window openings, or other architectural details before installing piping.

Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and contract without damage to itself, equipment, or the building structure.

Mitered ells, notched tees, and orange peel reducers are not acceptable. On threaded piping, bushings are not acceptable. "Weldolets" and "Thredolets" may be used for branch takeoffs up to 1/2 the diameter of the main.

Do not route piping through transformer vaults or above transformers, panelboards, or switchboards, including the required service space for this equipment, unless the piping is serving this equipment. Install all valves, and piping specialties, including items furnished by others, as shown on the plans and specified herein. Make connections to all equipment installed by others where that equipment requires the piping services indicated in this section.

C.8.5.2 Welded Pipe Joints

Construct all welded joints by fusion welding in accordance with ASME Codes, ANSI B31, and state codes where applicable. Electrodes shall be with coating and diameter as recommended by the manufacturer for the type and thickness of work being done.

C.8.5.3 Threaded Pipe Joints

Use a Teflon based thread lubricant or Teflon tape when making joints. No hard setting pipe thread cement or caulking will be allowed.

C.8.5.4 Natural Gas

Pitch horizontal piping down 1-inch in 60 feet in the direction of flow. Install a 4-inch minimum depth dirt leg at the bottom of each vertical run and at each appliance. When installing mains and branches, cap gas tight each tee or pipe end which will not be

immediately extended. All branch connections to the main shall be from the top or side of the main.

Do not install gas pipe in a ventilation air plenum.

If an above ground vent terminates in an area subject to snow accumulation, terminate the line at least five feet above grade.

Install a shut off valve at each appliance. Provide a valved connection at the main for equipment and appliances furnished by others.

Piping through a roof shall be run through an approved roof penetration with flashing and counter flashing.

Each gas pressure reducing valve vent and relief valve vent shall be run separately to a point outside of the building, terminated with a screened vent cap, and located according to gas utility regulations.

Clean all welded piping before all regulators and control valves. Test by placing target cloth over piping and blow with compressed air. Clean piping until target cloth is clean and free of debris.

C.8.5.5 Unions and Flanges

Install a union or flange, as required, at each automatic control valve and at each piping specialty or piece of equipment which may require removal for maintenance, repair, or replacement. Where a valve is located at a piece of equipment, locate the flange or union connection on the equipment side of the valve. Concealed unions or flanges are not acceptable.

C.8.5.6 Piping System Leak Tests

Verify that the piping system being tested is fully connected to all components and that all equipment is properly installed, wired, and ready for operation. If required for the additional pressure load under test, provide temporary restraints at expansion joints or isolate them during the test. Verify that hangers can withstand any additional weight load that may be imposed by the test.

Provide all piping, fittings, blind flanges, and equipment to perform the testing. Conduct pressure test with test medium of air or water unless specifically indicated. Minimum test time is indicated in the table below; additional time may be necessary to conduct an examination for leakage. Each test must be witnessed by the engineer. If leaks are found, repair the area with new materials and repeat the test. Caulking will not be acceptable.

Do not insulate pipe until it has been successfully tested.

For hydrostatic tests, use clean water and remove all air from the piping being tested by means of air vents or loosening of flanges/unions. Measure and record test pressure at the high point in the system.

For air tests, gradually increase the pressure to not more than one half of the test pressure; then increase the pressure in steps of approximately one-tenth of the test pressure until the required test pressure is reached. Examine all joints and connections with a soap bubble solution or equivalent method. The piping system exclusive of possible localized instances at pump or valve packing shall show no evidence of leaking. After testing is complete, slowly release the pressure in a safe manner.

Measure natural gas system test pressure with a water manometer or an equivalent device calibrated in increments not greater than 0.1 inch water column. System will not be approved until it can be demonstrated that there is no measurable loss of test pressure during the test period.

<u>System</u>	<u>Pressure</u>	<u>Medium</u>	<u>Duration</u>
Natural gas	100 psig	Air	24 hr

All pressure tests are to be documented on forms to be provided by the contractor.

On piping that can not be tested because of connection to an active line, provide temporary blind flanges and hydrostatically test new section of piping. After completion of test, remove temporary flanges and make final connections to piping. Die penetrate test pass weld or x-ray the piping that was not hydrostatically tested up to the active system.

C.8.6 Fuel-Fired Heaters

Install units as shown on plans and according to the manufacturer's installation instructions. Pipe vents from gas regulator to outside where regulators are provided. Install thermostats where indicated on the plans. Provide all wiring between thermostats and the gas fired item.

Install gas fired units and connect gas, combustion air and vent piping as instructed by the manufacture and in compliance with applicable code requirements. Suspend from building structure to maintain headroom beneath units. Connect combustion air and venting to outside of building as indicated on the plans and terminate per the manufacturer's instructions.

C.8.7 Heating Terminal Units

Install units in accordance with manufacturer's installation instructions. Install branch water or steam/condensate piping to each unit with a minimum of three elbows to allow for expansion and contraction of the piping system. Coordinate location of units with other trades to assure correct recess size for recessed units.

Install electric heating units where indicated on the plans. Where heaters are indicated to be installed in ductwork, provide manufacturers recommended upstream and downstream ductwork to prevent overheating problems.

After installation, provide protective covers to prevent accumulation of dirt on units during balance of construction.

C.9 Plumbing

C.9.1 General

Perform all plumbing work in accordance with requirements of the Wisconsin Administrative Code. The work shall be inspected and approved by the local building department. Install all plumbing work as shown on the plans and as specified herein.

C.9.1.1 Plumbing Excavation and Backfill

Perform all excavation and backfill work necessary to accomplish indicated plumbing systems installation. Excavate to bottom of pipe and structure bedding, 4" in stable soils, 6" in rock or wet trenches and 8" in unstable soil. Finish bottoms of excavations to true, level surface. Excavate whatever materials are encountered as required to place at the elevations shown, all pipe, manholes, and other work. Remove debris and rubbish from excavations before placing bedding and backfill material.

At no time place excavated materials where they will impede surface drainage unless such drainage is being safely rerouted away from the excavation. Remove surplus excavated materials from site.

Verify the locations of any water, drainage, gas, sewer, electric, telephone or steam lines which may be encountered in the excavation. Underpin and support all lines. Cut off service connections encountered which are to be removed at the limits of the excavation and cap.

Provide and maintain all fencing, signs, warning lights, and/or other equipment necessary to keep all excavation pits, trenches and the entire subgrade area safe at all times. No excavation shall be left unattended without adequate protection.

Elevations shown on the plans are subject to such revisions as may be necessary to fit field conditions as directed by the engineer.

Install lines passing under foundations with minimum of 1-1/2 inch clearance to concrete and insure there is no disturbance of bearing soil. Bed pipe up to a point 12 inches above the top of the pipe. Take care during bedding, compaction, and backfill not to disturb or damage piping.

Mechanically compact bedding and backfill to prevent settlement. The initial compacted lift to not exceed 24 inches compacted to 95% density per Modified Proctor Test (ASTM D-1557). Subsequent lifts under pavements, curbs, walks and structures are not to exceed 12 inches and be compacted to 95% density per Modified Proctor Test. Route the equipment over each lift of the material so that the compaction equipment contacts all areas of the surface of the lift.

C.9.1.2 Plumbing Sheeting, Shoring and Bracing

Provide shoring, sheet piling and bracing in conformance with the Wisconsin Administrative Code to prevent earth from caving or washing into the excavation. Shore and underpin to properly support adjacent or adjoining structures. Remove all sheet piling and underpinning after completion of work as directed by the engineer.

C.9.1.3 Plumbing Identification

Identify equipment in mechanical equipment rooms. Engraved name plates may be used as specified in Section B.9. Equipment shall be designated with the contract drawings designation and description. Example: SP-1 Sump Pump.

Identify interior piping not less than once every 30 feet, not less than once in each room, adjacent to each access door or panel, and on both side of the partition where accessible piping passes through walls or floors. Place flow directional arrows at each pipe identification location.

Identify all exterior buried piping for entire length with underground warning tape except for sewer piping which is routed in straight lines between manholes or cleanouts. Place tape 6"-12" below finished grade along entire length of pipe. Extend tape to surface at building entrances, meters, hydrants and valves. Where existing underground warning tape is broken during excavation, replace with new tape identifying appropriate service and securely spliced to ends of existing tape.

Identify valves with brass tags bearing a system identification and a valve sequence number. Valve tags are not required at a terminal device unless the valves are greater than ten feet from the device, located in another room or not visible from device. Provide a typewritten valve schedule and pipe identification schedule indicating the valve number and the equipment or areas supplied by each valve and the symbols used for pipe identification. Locate schedules in mechanical room and in each operating and maintenance manual. Schedule in mechanical room shall be framed under clear plastic.

C.9.1.4 Lubrication

Lubricate all bearings with lubricant as recommended by the manufacturer before the equipment is operated for any reason. Once the equipment has been run, maintain lubrication in accordance with the manufacturer's instructions until the work is accepted by the department. Maintain a log of all lubricants used and frequency of lubrication; include this information in the operating and maintenance manuals at the completion of the project.

C.9.1.5 Sleeves

Provide galvanized sheet metal sleeves for pipe penetrations through interior and exterior walls to provide a backing for sealant or firestopping. Patch wall around sleeve to match adjacent wall construction and finish. Grout area around sleeve in masonry construction. In finished spaces where pipe penetration through wall is exposed to view, sheet metal sleeve shall be installed flush with face of wall.

Pipe sleeves in new poured concrete construction shall be schedule 40 galvanized steel pipe sized to allow insulated pipe to run through sleeve and cast in place.

In all piping floor penetrations, fire rated and non-fire rated, top of sleeve shall extend 1 inch above the adjacent finished floor. In existing floor penetrations, core drill sleeve opening large enough to insert schedule 40 galvanized steel pipe sleeve and grout area around sleeve with hydraulic setting, non-shrink grout. If the pipe penetrating the sleeve is supported by a pipe clamp resting on the sleeve, weld a collar or struts to the sleeve that will transfer weight to existing floor structure.

For pipe penetrations through beams insert a schedule 80 steel pipe sleeve to provide a backing for sealant or firestopping.

C.9.1.6 Sealing and Firestopping

For fire and/or smoke rated penetrations, install approved product in accordance with the manufacturer's instructions where a pipe penetrates a fire/smoke rated surface. When pipe is insulated, use a product which maintains the integrity of the insulation and vapor barrier. Where firestop mortar is used to infill large fire-rated floor openings that could be required to support weight, provide permanent structural forming. Firestop mortar alone is not adequate to support substantial weight.

For non-rated partitions in exterior wall openings below grade, assemble rubber links of mechanical seal to the proper size for the pipe and tighten in place in accordance with the manufacturer's instructions.

For non-rated partitions at all interior and exterior walls, pipe penetrations are required to be sealed. Apply sealant to both sides of the penetration in such a manner that the annular space between the pipe sleeve or cored opening and the pipe or insulation is completely blocked.

C.9.1.7 Welder Qualifications

Welding procedures, welders, and welding operators for all building service piping to be in accordance with certified welding procedures of the National Certified Pipe Welding Bureau and Section 927.5 of ASME B31.9 Building Services Piping or AWS 10.9 Qualification of Welding Procedures and Welders for Piping and Tubing. Before any metallic welding is performed, submit the Standard Welding Procedure Specification together with the Procedure Qualification Record as required by Section 927.6 of ASME B31.9 Building Services Piping.

Before any polyethylene fusion welding is performed, submit certification that the welders to be used on this project have successfully demonstrated proper welding procedures in accordance with the Code of Federal Regulations, Title 49, Part 192, Section 192.285.

The engineer reserves the right to test the work of any welder employed on the project, at the department's expense. If the work of the welder is found to be unsatisfactory, the welder shall be prevented from doing further welding on the project and all defective welds shall be replaced at the contractor's expense.

C.9.2 Plumbing Specialties

Coordinate location and setting of plumbing specialties with adjacent construction. Install in accordance with manufacturers recommendations.

Set floor drains, roof drains, and cleanouts level and plumb adjusted to finished floor elevation, roof elevation or finished wall location. Locate where serviceable. Allow minimum of 18" clearance around cleanouts for rodding. Lubricate threaded cleanout plugs with graphite and oil, teflon tape or waterproof grease. Install trap primer connections where indicated. Provide deep seal traps on floor drains and hub drains installed in mechanical rooms, penthouses or rooms with excessive positive or negative pressure.

Floor drains and hub drains shall have installations of combination trap evaporation/backflow preventer diaphragm installations.

Install water hammer arrestors where indicated and at quick closing valve installations.

Install backflow preventers in accordance with Wisconsin Department of Safety and Professional Services requirements maintaining minimum clearance distances for servicing and testing. Provide indirect waste piping with air gap installation from relief opening to above hub drain or floor drain. Where backflow preventers requiring Department of Safety and Professional Services registration are installed, provide initial registration, testing and report filing required by Department of Safety and Professional Services. List the name and address of the building that the backflow preventer installations occur in.

Excavate for manholes setting precast bases on granular backfill and pouring cast in place bases on undisturbed soil. Seal joints between base, sections, collars and castings with gasketing material for tightly packed waterproof seals. Adjust casting to match finished grade. Form interior shelves with concrete grout for smooth flowlines conforming to the shape and slope of the sewer. Place piping into manholes providing full support of piping on exterior bedding and insuring pipe seals are properly installed and waterproof. Backfill and compact soil around manhole.

Flash vent penetrations through roof. Turn down top of lead flashings into vent pipe. Tighten drawband of membrane boot to vent pipe. Adhere base flashing to deck or membrane. Provide waterproof patch around penetration on existing roofs.

C.9.3 General Duty Valves for Plumbing Piping

Properly align piping before installation of valves. Install and test valves in strict accordance with valve manufacturer's installation recommendations. Do not support weight of piping system on valve ends. Mount valves in locations which allow access for

operation, servicing and replacement. Provide valve handle extensions for all valves installed in insulated piping. Install all valves with the stem in the upright or horizontal position. If possible, install butterfly valves with the stem in the horizontal position. Valves installed with the stems down will not be accepted. Prior to flushing of piping systems, place all valves in the full-open position.

Install shut-off valves at each piece of equipment, at each branch take-off from mains for isolation or repair and elsewhere as indicated.

Install drain valves for complete drainage of all systems. Locations of drain valves include low points of piping systems, downstream of riser isolation valves, equipment locations specified or detailed, other locations required for drainage of systems and elsewhere as indicated.

Install safety relief valves on all pressure vessels and elsewhere as indicated. Inlet and outlet piping connecting to valves must be the same size as valve connections or larger. Pipe discharge to drain where indicated or to floor.

For compressed air valves, install shut-off valves at each piece of equipment, base of drip legs and elsewhere as indicated. Install safety exhaust shut-off valves at terminal equipment designed for frequent removal. Install pressure reducing valves at filter stations and elsewhere as indicated. Mount in readily accessible location for gauge and maintenance access.

C.9.4 Hangers and Supports for Plumbing Piping and Equipment

C.9.4.1 General

Do not hang any plumbing item directly from a metal deck or run piping so its rests on the bottom chord of any truss or joist. Support apparatus and material under all conditions of operation, variations in installed and operating weight of equipment and piping, to prevent excess stress, and allow for proper expansion and contraction.

Protect insulation at all hanger points.

C.9.4.2 Installation

Size, apply and install supports and anchors in compliance with manufacturers recommendations.

Install supports to provide for free expansion of the piping system. Support all piping from the structure using concrete inserts, beam clamps, ceiling plates, wall brackets, or floor stands. Fasten ceiling plates and wall brackets securely to the structure and test to demonstrate the adequacy of the fastening.

Coordinate hanger and support installation to properly group piping of all trades. Where piping can be conveniently grouped to allow the use of trapeze type supports, use standard structural shapes or continuous insert channels for the supporting steel. Where continuous insert channels are used, pipe supporting devices made specifically for use with the

channels may be substituted for the specified supporting devices provided that similar types are used and all data is submitted for prior approval by the engineer.

Size and install hangers and supports, except for riser clamps, for installation on the exterior of piping insulation. Where a vapor barrier is not required, hangers may be installed either on the exterior of pipe insulation or directly on piping.

Perform welding in accordance with standards of the American Welding Society.

C.9.4.3 Hanger and Support Spacing

Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work. Place a hanger within 12 inches of each horizontal elbow, valve, strainer, or similar piping specialty item. Use hangers with 1-1/2 inch minimum vertical adjustment.

Where several pipes can be installed in parallel and at the same elevation, provide multiple or trapeze hangers.

Support riser piping independently of connected horizontal piping. Adjust hangers to obtain the slope specified in the piping section of these specifications. Space hangers for pipe as follows:

<u>Pipe Material</u>	<u>Pipe Size</u>	<u>Max Horiz. Spacing</u>	<u>Max Vert. Spacing</u>
Cast Iron	2" and larger	5'-0"	15'-0"
Copper	1/2" through 3/4"	5'-0"	10'-0"
Copper	1" through 1-1/4"	6'-0"	10'-0"
Copper	1-1/2" through 2-1/2"	8'-0"	10'-0"
Ductile Iron	All	10'-0"	20'-0"
Plastic	Drain and Vent	4'-0"	10'-0"
Plastic	1" or less	32"	4'-0"
Plastic	1-1/4" and over	4'-0"	6'-0"
Plastic	Pure Water 1-1/2" or less	Continuous	5'-0"

C.9.4.4 Vertical Support

Support vertical piping with clamps secured to the piping and resting on the building structure.

C.9.4.5 Concrete Inserts

Select size based on the manufacturer's stated load capacity and weight of material that will be supported. Locate continuous insert channels on 6'-0" maximum centers and 2'-0" from corners. Use inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inch size. Where concrete slabs form finished ceiling, install inserts that are flush with the slab surface.

C.9.5 Plumbing Insulation

C.9.5.1 Installation

Install all insulation in accordance with the latest edition of MICA (Midwest Insulation Contractors Association) Standard and manufacturer's installation instructions. Exceptions to these standards will only be accepted where specifically modified in these specifications, or where prior written approval has been obtained from the engineer.

Install insulation, jackets and accessories in accordance with manufacturer's instructions and under ambient temperatures and conditions recommended by manufacturer. Surfaces to be insulated must be clean and dry.

Do not insulate systems or equipment which are specified to be pressure tested or inspected, until testing, inspection and any necessary repairs have been successfully completed.

Install insulation with smooth and even surfaces. Poorly fitted joints or use of filler in voids will not be accepted. Cover and seal exposed fiberglass insulation when insulation is terminated. No raw fiberglass insulation is allowed. Provide neat and coated terminations at all nameplates, uninsulated fittings, or at other locations where insulation terminates. Install with longitudinal joints facing wall or ceiling.

Seal off raw ends of insulation and butt joints with vapor barrier mastic at intervals of not more than 20 feet on piping requiring a vapor barrier.

Install fabric reinforcing without wrinkles. Overlap seams a minimum of 2 inches.

Use full-length material as delivered from manufacturer wherever possible. Scrap piecing of insulation or pieces cut undersize and stretched to fit will not be accepted. Insulation shall be continuous through sleeves and openings. Vapor barriers shall be maintained continuous through all penetrations. Provide a complete vapor barrier for insulation on the following systems: cold water (potable and non-potable) and storm water.

C.9.5.2 Piping, Valve, and Fitting Insulation

Install insulation with butt joints and longitudinal seams closed tightly. Provide minimum 2" lap on jacket seams and 2" tape on butt joints, firmly cemented with lap adhesive. Additionally secure with staples along seams and butt joints. Coat staples with vapor barrier mastic on systems requiring vapor barrier.

Water supply piping insulation shall be continuous throughout the building and installed adjacent to and within building walls to a point directly behind the fixture that is being supplied.

Install insulation continuous through pipe hangers and supports with hangers and supports on the exterior of insulation. Where a vapor barrier is not required, hangers and supports may be attached directly to piping with insulation completely covering hanger or support and jacket sealed at support rod penetration. Where riser clamps are required to be

attached directly to piping requiring vapor barrier, extend insulation and vapor barrier jacketing/coating around riser clamp.

Install insulation inserts and pipe shields at all hanger and support locations. Inserts may be omitted on 3/4" and smaller copper piping provided 12" long 22 gauge pipe shields are used.

Fittings, valves, unions, flanges, couplings and specialties may be insulated with factory molded or built up insulation of the same thickness as adjoining insulation. Cover insulation with fabric reinforcing and mastic or where temperatures do not exceed 150 degrees, PVC fitting covers. Secure PVC fitting covers with tack fasteners and 1-1/2" band of mastic over ends, throat, seams or penetrations. On systems requiring vapor barrier, use vapor barrier mastic.

Provide a protective PVC jacket for the following insulated piping: Roof Drain bodies and Conductor Piping in the Salt Brine Building. Lap seams and joints a minimum of 2 inches and continuously seal with welding solvent recommended by jacket manufacturer. Lap slip joint ends 4" without fasteners where required to absorb expansion and contraction. For sections where vapor barrier is not required and jacket requires routine removal, tack fasteners may be used.

Provide insulation on new piping as indicated in the following schedule:

Service	Types	Insulation Thickness by Pipe Size				
		1" and Less	1-1/4" to 2"	2-1/2" to 4"	5" to 6"	8" and Larger
Hot Water Supply	Rigid Fiberglass	1"	1"	1.5"	1.5"	1.5"
Cold Water	Rigid Fiberglass	0.5"	0.5"	1"	1"	1"
Non-Potable cold water	Rigid Fiberglass	0.5"	0.5"	1"		
Horizontal Storm Piping and 4'-0" of vertical piping thereafter	Rigid Fiberglass	0.5"	0.5"	0.5"	0.5"	1"
Roof Drain bodies	Rigid Fiberglass	0.5"	0.5"	0.5"	0.5"	1"

The following piping and fittings are not to be insulated:

- Chrome plated exposed supplies and stops (except where specifically noted).
- Water hammer arrestors.
- Piping unions and flanges for systems not requiring a vapor barrier.

C.9.6 Building Water Distribution

C.9.6.1 General

Promptly inspect shipments to insure that the material is undamaged and complies with the specifications. Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid condensation. Do not store materials directly on grade. Protect pipe, tube, and fitting ends so they are not damaged. Where end caps are provided or specified, take precautions so the caps remain in place. Protect fittings, flanges, and unions by storage inside or by durable, waterproof, above ground packaging. Offsite storage agreements will not relieve the contractor from using proper storage techniques. Storage and protection methods must allow inspection to verify products.

Install pipe and fittings in accordance with reference standards, manufacturers' recommendations and recognized industry practices.

Cut pipe ends square. Ream ends of piping to remove burrs. Clean scale and dirt from interior and exterior of each section of pipe and fitting prior to assembly.

Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute piping as required to clear such interferences. Coordinate locations of plumbing piping with piping, ductwork, conduit and equipment of other trades to allow sufficient clearances. In all cases, consult the plans for exact location of pipe spaces, ceiling heights, door and window openings, or other architectural details before installing piping.

Install underground warning tape 6" to 12" below finished grade above all exterior below ground piping. Where existing underground warning tape is encountered, repair and replace.

Maintain piping in clean condition internally during construction.

Provide clearance for installation of insulation, access to valves and piping specialties.

Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and contract without damage to itself, equipment, or building.

Do not route piping through transformer vaults or above transformers, panelboards, or switchboards, including the required service space for this equipment, unless the piping is serving this equipment.

Install all valves and piping specialties, including items furnished by others, as specified and/or detailed on the plans. Provide access to valves and specialties for maintenance. Make connections to all equipment, fixtures and systems installed by others where same requires the piping services indicated in this section.

C.9.6.2 Copper Pipe Joints

Remove all slivers and burrs remaining from the cutting operation by reaming and filing both pipe surfaces. Clean fitting and tube with metal brush, emery cloth or sandpaper. Remove residue from the cleaning operation, apply flux and assemble joint to socket stop. Apply flame to fitting until solder melts when placed at joint. Remove flame and feed solder into joint until full penetration of cup and ring of solder appears. Wipe excess solder and flux from joint.

C.9.6.3 Solvent Welded Pipe Joints

Install solvent welded pipe joints in accordance with ASTM D2855 "Making Solvent Cemented Joints with PVC Pipe and Fittings". Saw cut piping square and smooth. Tube cutters may be used if they are fitted with wheels designed for use with PVC/CPVC pipe that do not leave a raised bead on pipe exterior. Support and restrain pipe during cutting to prevent nicks and scratches. Bevel ends 10-15 degrees and deburr interior. Remove dust, drips, moisture, grease and other superfluous materials from pipe interior and exterior. Check dry fit of pipe and fittings. Reject materials which are out of round or do not fit within close tolerance. Use heavy body solvent cement for large diameter fittings.

Maintain pipe, fittings, primer and cement between 40 and 100 degrees during application and curing. Apply primer and solvent using separate daubers (3" and smaller piping only) or clean natural bristle brushes about 1/2 the size of the pipe diameter. Apply primer to the fitting socket and pipe surface with a scrubbing motion. Check for penetration and reapply as needed to dissolve surface to a depth of 4-5 thousandths. Apply solvent cement to the fitting socket and pipe in an amount greater than needed to fill any gap. While both surfaces are wet, insert pipe into socket fitting with a quarter turn to the bottom of the socket. Solvent cement application and insertion must be completed in less than 1 minute. Minimum of 2 installers is required on piping 4" and larger. Hold joint for 30 seconds or until set. Reference manufacturer's recommendations for initial set time before handling and for full curing time before pressure testing. Cold weather solvent/cement may be utilized only under unusual circumstances and when specifically approved by the engineer.

C.9.6.4 Mechanical Grooved Pipe Connections

Use pipe factory grooved in accordance with the coupling manufacturer's specifications or field grooved pipe in accordance with the same specifications using specially designed tools specially designed for the application. Lubricate pipe and coupling gasket, align pipe, and secure joint in accordance with the coupling manufacturer's specifications.

C.9.6.5 Mechanically Formed Tee Fittings

The use of mechanically formed tee fittings is not permitted on this project.

C.9.6.6 Domestic Water

Maintain piping system in clean condition during installation. Remove dirt and debris from assembly of piping as work progresses. Cap open pipe ends where left unattended or subject to contamination.

Install exterior water piping below predicted frost level in accordance with DSPS Table 382.30-6, but in no case less than 6' bury depth to top of pipe. Maintain minimum of 8' horizontal distance between 2-1/2" and larger water piping and sanitary sewer piping. Maintain minimum of 30" horizontal and 12" vertical distance, water on top, between 2" and smaller water piping and sanitary sewer piping. Where water piping crosses a sanitary sewer, provide minimum 18" vertical clearance and waterproof PVC water pipe sleeve sealed at both ends for distance of 10' from sewer in both directions.

Install interior water piping with drain valves where indicated and at low points of system to allow complete drainage. Install shutoff valves where indicated and at the base of risers to allow isolation of portions of system for repair. Do not install water piping within exterior walls.

C.9.6.7 Underground Pipe Wrap

Use for steel piping encased in concrete or underground which is not in a conduit. Remove all dirt and other foreign material from exterior of pipe. Apply primer as recommended by the manufacturer. Use a spiral wrap process for applying tape to the pipe. Repair any breaks in the tape coating caused by the installation process.

C.9.6.8 Dielectric Unions and Flanges

Install dielectric unions or flanges at each point where a copper-to-steel pipe connection is required in domestic water systems.

C.9.6.9 Unions and Flanges

Install a union or flange at each connection to each piece of equipment and at other items which may require removal for maintenance, repair, or replacement. Where a valve is located at a piece of equipment, locate the flange or union connection on the equipment side of the valve. Concealed unions or flanges are not acceptable.

C.9.6.10 Piping System Leak Tests

Isolate or remove components from system which are not rated for test pressure. Test piping in sections or entire system as required by sequence of construction. Do not insulate or conceal pipe until it has been successfully tested.

If required for the additional pressure load under test, provide temporary restraints at fittings or expansion joints. Backfill underground water mains prior to testing with the exception of thrust restrained valves which may be exposed to isolate potential leaks.

For hydrostatic tests, use clean water and remove all air from the piping being tested by means of air vents or loosening of flanges/unions. Measure and record test pressure at the high point in the system.

Inspect system for leaks. Where leaks occur, repair the area with new materials and repeat the test; caulking will not be acceptable.

Entire test must be witnessed by the engineer. All pressure tests are to be documented on forms to be provided by the contractor.

System	Test Medium	Final Test Pressure	Final Test Duration
*Below Ground Domestic Water	Water	200 psig	2 hr
Above Ground Domestic Water	Water	100 psig	8 hr
Above Ground Non-potable Water	Water	100 psig	8 hr
Below Ground Non-potable Water	Water	100 psig	8 hr

Leakage on exterior mains 3" and larger may not exceed leakage calculated as follows:
GPH Allowable Leakage = [(Feet of Pipe)(Inches Dia. of Pipe)(Test Pressure)⁵]/[133,200]

C.9.7 Building Sanitary Sewerage

C.9.7.1 General

Promptly inspect shipments to insure that the material is undamaged and complies with the specifications. Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid condensation. Do not store materials directly on grade. Protect pipe, tube, and fitting ends so they are not damaged. Where end caps are provided or specified, take precautions so the caps remain in place. Protect fittings, flanges, and unions by storage inside or by durable, waterproof, above ground packaging. Offsite storage agreements will not relieve the contractor from using proper storage techniques. Storage and protection methods must allow inspection to verify products.

Install pipe and fittings in accordance with reference standards, manufacturers' recommendations and recognized industry practices.

Cut pipe ends square. Ream ends of piping to remove burrs. Clean scale and dirt from interior and exterior of each section of pipe and fitting prior to assembly.

Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute piping as required to clear such interferences. Coordinate locations of plumbing piping with piping, ductwork, conduit and equipment of other trades to allow sufficient clearances. In all cases, consult the plans for exact location of pipe spaces, ceiling heights, door and window openings, or other architectural details before installing piping.

Install underground warning tape 6" to 12" below finished grade above all exterior below ground piping. Where existing underground warning tape is encountered, repair and replace.

Maintain piping in clean condition internally during construction.

Provide clearance for installation of insulation, access to valves and piping specialties.

Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and contract without damage to itself, equipment, or building.

Do not route piping through transformer vaults or above transformers, panelboards, or switchboards, including the required service space for this equipment, unless the piping is serving this equipment.

Install all valves and piping specialties, including items furnished by others, as specified and/or detailed on the plans. Provide access to valves and specialties for maintenance. Make connections to all equipment, fixtures and systems installed by others where same requires the piping services indicated in this section.

C.9.7.2 Solvent Welded Pipe Joints

Install solvent welded pipe joints in accordance with ASTM D2855 "Making Solvent Cemented Joints with PVC Pipe and Fittings". Saw cut piping square and smooth. Tube cutters may be used if they are fitted with wheels designed for use with PVC/CPVC pipe that do not leave a raised bead on pipe exterior. Support and restrain pipe during cutting to prevent nicks and scratches. Bevel ends 10-15 degrees and deburr interior. Remove dust, drips, moisture, grease and other superfluous materials from pipe interior and exterior. Check dry fit of pipe and fittings. Reject materials which are out of round or do not fit within close tolerance. Use heavy body solvent cement for large diameter fittings.

Maintain pipe, fittings, primer and cement between 40 and 100 degrees during application and curing. Apply primer and solvent using separate daubers (3" and smaller piping only) or clean natural bristle brushes about 1/2 the size of the pipe diameter. Apply primer to the fitting socket and pipe surface with a scrubbing motion. Check for penetration and reapply as needed to dissolve surface to a depth of 4-5 thousandths. Apply solvent cement to the fitting socket and pipe in an amount greater than needed to fill any gap. While both surfaces are wet, insert pipe into socket fitting with a quarter turn to the bottom of the socket. Solvent cement application and insertion must be completed in less than 1 minute. Minimum of 2 installers is required on piping 4" and larger. Hold joint for 30 seconds or until set. Reference manufacturer's recommendations for initial set time before handling and for full curing time before pressure testing. Cold weather solvent/cement may be utilized only under unusual circumstances and when specifically approved by the engineer.

C.9.7.3 Push-On Gasketed Pipe Connections

Clean pipe end, bell, gasket seat and gasket of dirt or debris. Coat end of pipe and gasket with gasket lubricant. Insure pipe is supported off the ground so lubricant does not pick up dirt. Push spigot end into gasket bell with levered pipe joining tool recommended by pipe manufacturer. Large diameter exterior mains may be joined by pushing end of pipe section with backhoe against wood blocking over pipe end. Insert to fully seated position or to reference mark on pipe.

C.9.7.4 Sanitary Waste and Vent

Verify invert elevations and building elevations prior to installation. Install exterior piping pitched to drain at indicated elevations and slope. Install interior piping pitched to drain at minimum slope of 1/4" per foot where possible and in no case less than 1/8" per foot for piping 3" and larger.

Install exterior piping below predicted frost level and not less than 5' bury depth to top of pipe wherever possible. Where piping is located above predicted frost level, provide frost protection in accordance with SPS 382.30(11)(c).

Flush piping inlets (floor drains, hub drains, mop basins, fixtures, etc.) with high flow of water at completion of project to demonstrate full flow capacity. Remove blockages and make necessary repairs where flow is found to be impeded.

C.9.7.5 Piping System Leak Tests

Isolate or remove components from system which are not rated for test pressure. Test piping in sections or entire system as required by sequence of construction. Do not insulate or conceal pipe until it has been successfully tested.

If required for the additional pressure load under test, provide temporary restraints at fittings or expansion joints.

For hydrostatic tests, use clean water and remove all air from the piping being tested by means of air vents or loosening of flanges/unions. Measure and record test pressure at the high point in the system.

Inspect system for leaks. Where leaks occur, repair the area with new materials and repeat the test; caulking will not be acceptable.

Entire test must be witnessed by the engineer. All pressure tests are to be documented on forms to be provided by the contractor.

System	Medium	Final Test Pressure	Final Test Duration
Sanitary Waste and Vent	Water	10' water	2 hr

C.9.8 Building Storm Drainage

C.9.8.1 General

Promptly inspect shipments to insure that the material is undamaged and complies with the specifications. Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid condensation. Do not store materials directly on grade. Protect pipe, tube, and fitting ends so they are not damaged. Where end caps are provided or specified, take precautions so the caps remain in place. Protect fittings, flanges, and unions by storage inside or by durable, waterproof, above ground packaging. Offsite storage agreements will not relieve the contractor from using proper storage techniques. Storage and protection methods must allow inspection to verify products.

Install pipe and fittings in accordance with reference standards, manufacturers' recommendations and recognized industry practices.

Cut pipe ends square. Ream ends of piping to remove burrs. Clean scale and dirt from interior and exterior of each section of pipe and fitting prior to assembly.

Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute piping as required to clear such interferences. Coordinate locations of plumbing piping with piping, ductwork, conduit and equipment of other trades to allow sufficient clearances. In all cases, consult the plans for exact location of pipe spaces, ceiling heights, door and window openings, or other architectural details before installing piping.

Where copper or steel piping is embedded in masonry, provide protective sleeve covering of elastomeric pipe insulation.

Install underground warning tape 6" to 12" below finished grade above all exterior below ground piping. Where existing underground warning tape is encountered, repair and replace.

Maintain piping in clean condition internally during construction.

Provide clearance for installation of insulation, access to valves and piping specialties.

Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and contract without damage to itself, equipment, or building.

Do not route piping through transformer vaults or above transformers, panelboards, or switchboards, including the required service space for this equipment, unless the piping is serving this equipment.

Install all valves and piping specialties, including items furnished by others, as specified and/or detailed on the plans. Provide access to valves and specialties for maintenance. Make connections to all equipment, fixtures and systems installed by others where same requires the piping services indicated in this section.

C.9.8.2 Copper Pipe Joints

Remove all slivers and burrs remaining from the cutting operation by reaming and filing both pipe surfaces. Clean fitting and tube with metal brush, emery cloth or sandpaper. Remove residue from the cleaning operation, apply flux and assemble joint to socket stop. Apply flame to fitting until solder melts when placed at joint. Remove flame and feed solder into joint until full penetration of cup and ring of solder appears. Wipe excess solder and flux from joint.

C.9.8.3 Welded Pipe Joints

Construct all welded joints by fusion welding in accordance with ASME Codes, ANSI B31, and state codes where applicable. "Weldolets" and "Threadolets" may be used for branch takeoffs up to 1/2 the diameter of the main.

C.9.8.4 Threaded Pipe Joints

Use a thread lubricant or teflon tape when making joints. No hard setting pipe thread cement or caulking are allowed.

C.9.8.5 Solvent Welded Pipe Joints

Install solvent welded pipe joints in accordance with ASTM D2855 "Making Solvent Cemented Joints with PVC Pipe and Fittings". Saw cut piping square and smooth. Tube cutters may be used if they are fitted with wheels designed for use with PVC/CPVC pipe that do not leave a raised bead on pipe exterior. Support and restrain pipe during cutting to prevent nicks and scratches. Bevel ends 10-15 degrees and deburr interior. Remove dust, drips, moisture, grease and other superfluous materials from pipe interior and exterior. Check dry fit of pipe and fittings. Reject materials which are out of round or do not fit within close tolerance. Use heavy body solvent cement for large diameter fittings.

Maintain pipe, fittings, primer and cement between 40 and 100 degrees during application and curing. Apply primer and solvent using separate daubers (3" and smaller piping only) or clean natural bristle brushes about 1/2 the size of the pipe diameter. Apply primer to the fitting socket and pipe surface with a scrubbing motion. Check for penetration and reapply as needed to dissolve surface to a depth of 4-5 thousandths. Apply solvent cement to the fitting socket and pipe in an amount greater than needed to fill any gap. While both surfaces are wet, insert pipe into socket fitting with a quarter turn to the bottom of the socket. Solvent cement application and insertion must be completed in less than 1 minute. Minimum of 2 installers is required on piping 4" and larger. Hold joint for 30 seconds or until set. Reference manufacturer's recommendations for initial set time before handling and for full curing time before pressure testing. Cold weather solvent/cement may be utilized only under unusual circumstances and when specifically approved by the engineer.

C.9.8.6 Mechanical Hubless Pipe Connections

Place the gasket on the end of one pipe or fitting and the clamp assembly on the end of the other pipe or fitting. Firmly seat the pipe or fitting ends against the integrally molded shoulder inside the neoprene gasket. Slide the clamp assembly into position over the gasket. Tighten fasteners to manufacturer's recommended torque.

C.9.8.7 Mechanical Joint Pipe Connections

Comply with AWWA C600/C605 installation requirements. Clean pipe end and socket. Clean and lubricate pipe end, socket and gasket with soapy water or gasket lubricant. Place gland and gasket, properly oriented, on pipe end. Insert pipe end fully into socket and press gasket evenly into recess keeping joint straight. Press gland evenly against gasket, insert bolts and hand tighten nuts. Make joint deflection prior to tightening bolts. Evenly tighten bolts in sequence to recommended torque.

C.9.8.8 Push-On Gasketed Pipe Connections

Clean pipe end, bell, gasket seat and gasket of dirt or debris. Coat end of pipe and gasket with gasket lubricant. Insure pipe is supported off the ground so lubricant does not pick up dirt. Push spigot end into gasket bell with levered pipe joining tool recommended by pipe manufacturer. Large diameter exterior mains may be joined by pushing end of pipe section with backhoe against wood blocking over pipe end. Insert to fully seated position or to reference mark on pipe.

C.9.8.9 Mechanical Grooved Pipe Connections

Use pipe factory grooved in accordance with the coupling manufacturer's specifications or field grooved pipe in accordance with the same specifications using specially designed tools specially designed for the application. Lubricate pipe and coupling gasket, align pipe, and secure joint in accordance with the coupling manufacturer's specifications.

C.9.8.10 Mechanically Formed Tee Fittings

The use of mechanically formed tee fittings is not permitted on this project.

C.9.8.11 Storm and Clear Water Waste and Vent

Verify invert elevations and building elevations prior to installation. Install exterior piping pitched to drain at indicated elevations and slope. Install interior piping pitched to drain at minimum slope of 1/8" per foot where possible and in no case less than 1/16" per foot for piping 3" and larger.

Install exterior piping below predicted frost level and not less than 5' bury depth to top of pipe wherever possible. Where piping is located above predicted frost level, provide frost protection in accordance with SPS 382.30(11)(c).

C.9.8.12 Piping System Leak Tests

Isolate or remove components from system which are not rated for test pressure. Test piping in sections or entire system as required by sequence of construction. Do not insulate or conceal pipe until it has been successfully tested.

If required for the additional pressure load under test, provide temporary restraints at fittings or expansion joints.

For hydrostatic tests, use clean water and remove all air from the piping being tested by means of air vents or loosening of flanges/unions. Measure and record test pressure at the high point in the system.

Inspect system for leaks. Where leaks occur, repair the area with new materials and repeat the test; caulking will not be acceptable.

Entire test must be witnessed by the engineer. All pressure tests are to be documented on forms to be provided by the contractor.

System	Test Medium	Final Test Pressure	Final Test Duration
Storm and Clear Water Waste & Vent	Water	10' water	2 hr

C.9.9 Compressed Air Piping

C.9.9.1 General

Promptly inspect shipments to insure that the material is undamaged and complies with the specifications. Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid condensation. Do not store materials directly on grade. Protect pipe, tube, and fitting ends so they are not damaged. Where end caps are provided or specified, take precautions so the caps remain in place. Protect fittings, flanges, and unions by storage inside or by durable, waterproof, above ground packaging. Offsite storage agreements will not relieve the contractor from using proper storage techniques. Storage and protection methods must allow inspection to verify products.

Install pipe and fittings in accordance with reference standards, manufacturers' recommendations and recognized industry practices.

Cut pipe ends square. Ream ends of piping to remove burrs. Clean scale and dirt from interior and exterior of each section of pipe and fitting prior to assembly.

Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute piping as required to clear such interferences. Coordinate locations of plumbing piping with piping, ductwork, conduit and equipment of other trades to allow sufficient clearances. In all cases, consult the plans for exact location of pipe spaces, ceiling heights, door and window openings, or other architectural details before installing piping.

Where copper or steel piping is embedded in masonry, provide protective sleeve covering of elastomeric pipe insulation.

Maintain piping in clean condition internally during construction.

Provide clearance for installation of insulation, access to valves and piping specialties.

Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and contract without damage to itself, equipment, or building.

Do not route piping through transformer vaults or above transformers, panelboards, or switchboards, including the required service space for this equipment, unless the piping is serving this equipment.

Install all valves and piping specialties, including items furnished by others, as specified and/or detailed on the plans. Provide access to valves and specialties for maintenance. Make connections to all equipment, fixtures and systems installed by others where same requires the piping services indicated in this section.

C.9.9.2 Copper Pipe Joints

Remove all slivers and burrs remaining from the cutting operation by reaming and filing both pipe surfaces. Clean fitting and tube with metal brush, emery cloth or sandpaper. Remove residue from the cleaning operation, apply flux and assemble joint to socket stop. Apply flame to fitting until solder melts when placed at joint. Remove flame and feed solder into joint until full penetration of cup and ring of solder appears. Wipe excess solder and flux from joint.

C.9.9.3 Threaded Pipe Joints

Use a thread lubricant or teflon tape when making joints. No hard setting pipe thread cement or caulking are allowed.

C.9.9.4 Compressed Air

Install a 4" minimum depth dirt leg at the bottom of each vertical run and at each outlet connection with shutoff valve at bottom of dirt leg.

C.9.9.5 Piping System Leak Tests

Isolate or remove components from system which are not rated for test pressure. Test piping in sections or entire system as required by sequence of construction. Do not insulate or conceal pipe until it has been successfully tested.

For air tests, gradually increase the pressure to not more than one half of the test pressure; then increase the pressure in steps of approximately one-tenth of the test pressure until the required test pressure is reached. Examine all joints and connections with a soap bubble solution or equivalent method. System will not be approved until it can be demonstrated that there is no measurable loss of test pressure during the test period.

Inspect system for leaks. Where leaks occur, repair the area with new materials and repeat the test; caulking will not be acceptable.

Entire test must be witnessed by the engineer. All pressure tests are to be documented on forms to be provided by the contractor.

<u>System</u>	<u>Test Medium</u>	<u>Final Test Pressure</u>	<u>Duration</u>
Compressed Air	Air	150 psig	24 hr

C.9.10 Water Heaters

Install plumbing equipment where indicated in accordance with manufacturer's recommendations. Coordinate equipment location with piping, ductwork, conduit and equipment of other trades to allow sufficient clearances. Locate equipment and arrange plumbing piping to provide access space for servicing all components.

Adjust and level equipment. Connect equipment to water and drain piping using unions or flanges and isolation valves.

Size temperature and pressure relief valves per CSA rating and pipe temperature and pressure relief valves to floor drain or floor as indicated on the plans. Start up and test equipment. Adjust operating and safety controls for proper operation.

C.9.11 Plumbing Fixtures

Install plumbing fixtures in accordance with manufacturer's instructions. Set level and plumb. Secure in place to counters, floors and walls providing solid bearing and secure mounting. Bolt fixture carriers to floor and wall. Secure rough-in fixture piping to prevent movement of exposed piping.

Install each fixture with trap easily removable for servicing and cleaning. Install fixture stops in readily accessible location for servicing.

Install barrier free fixtures in compliance with IBC 1108, 3408, SPS 362, and Federal ADA Accessibility Guidelines. Install barrier free lavatory traps parallel and adjacent to wall and supplies and stops elevated to 27" above floor to avoid contact by wheelchair users.

Each fixture shall have a stop valve installation to control the fixture. Stop valves shall be heavy duty type with brass stems and screwed or sweat inlet connections. Compression type inlets are not acceptable.

Cover pipe penetrations with escutcheons. Exposed traps, stops, piping and escutcheons to be chrome plated brass, same items in concealed locations may be of rough brass finish.

Set floor mounted water closets, floor mounted service sinks; counter mounted lavs and sinks; lav and sink faucets and drains with full setting bed of flexible non-staining plumber's putty.

Seal openings between walls, floors and fixtures with mildew-resistant silicone sealant same color as fixture.

Test fixtures to demonstrate proper operation. Replace malfunctioning units or components. Adjust valves for intended water flow rate to fixtures without splashing, noise or overflow. Adjust self-closing lavatory faucets to 15 second cycle. Adjust shower valve temperature limit stops to 110 degree maximum outlet temperature.

Protect fixtures during construction. At completion clean plumbing fixtures and trim using manufacturer's recommended cleaning methods and materials.

C.10 Disinfection of Domestic Water Lines

Verify that domestic water system is completed and cleaned. Do not start until conditions are satisfactory. Disinfect domestic water lines, and flush out systems at completion of treatment. Provide necessary signs, barricades, and notices to prevent any person from accidentally consuming water or disturbing system being treated.

Verify pH factor of water to be treated. If pH factor is less than 7.2, introduce sufficient alkali during disinfectant injection. If pH factor is greater than 7.6, introduce sufficient acid during disinfectant injection.

Inject disinfectant throughout system to obtain 50 to 80 ppm residual. Starting at outlet closest to water source, bleed water from each outlet until water produces odor of disinfectant. Repeat process at each outlet throughout system.

Test for disinfectant residual at ends of piping runs and remote outlets. Maintain disinfectant in system for 24 hours. If disinfectant residual is less than 25 ppm, repeat system treatment.

Remove disinfectant from system. Permit no more than residual rate of incoming water or 1.0 ppm, whichever is greater. Furnish disinfection report including the following information:

- Date issued
- Project name and location
- Treatment contractor's name, address, and phone number
- Type and form of disinfectant used
- Time and date of disinfectant injection start
- Time and date of disinfectant injection completion
- Test locations
- Initial and 24 hour disinfectant residuals in ppm for each outlet tested
- Time and date of flushing start
- Time and date of flushing completion
- Disinfectant residual after flushing in ppm for each outlet tested

Bacteriological laboratory shall be certified by the State of Wisconsin. Instruct bacteriological laboratory to take water samples no sooner than 24 hours after flushing system. Take water samples at each of the following locations:

- Where water enters system
- Ends of piping runs
- Remote outlets

Analyze water samples in accordance with Standard Methods for the Examination of Water & Waste Water, 14th edition, published by American Water Works Association, 6666 West Quincy Ave., Denver, CO 80235. Bacteriological report shall include:

- Date issued
- Project name and location
- Laboratory's name, certification number, address, and phone number
- Time and date of water sample collection
- Name of person collecting samples
- Test locations
- Time and date of laboratory test start
- Coliform bacteria test results for each outlet tested
- Certification that water conforms or fails to conform to bacterial standards of Federal Safe Drinking Water Act
- Bacteriologist's signature

Repeat system treatment if bacteriological test proves water quality to be unacceptable.

C.11 Fans

Perform the work per applicable codes. Install the fans per the manufacturer's instructions. Turn over to the electrical contractor the 4-speed controller and sufficient interconnecting cable to reach from the 4-speed controller to the fan for installation by the electrical contractor.

C.12 Overhead Doors

Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

Ensure that openings are square, flush and plumb. Do not proceed with installation of doors, operators, controls and accessories until unacceptable conditions are corrected.

Install door, track and operating equipment complete with all necessary accessories and hardware according to manufacturer's instructions.

Lubricate bearings and sliding parts. Assure weathertight fit around door perimeter and adjust doors for proper operation, balance, clearance and similar requirements.

Remove temporary coverings and protection of adjacent work areas. Repair or replace installed products damaged prior to or during installation. Clean installed products in accordance with manufacturer's instructions.

C.13 Service Doors

C.13.1 Steel Service Doors

Mechanically interlock longitudinal seams of honeycomb core type doors and panels. Leave seams invisible, or weld, fill and grind smooth. Reinforce and prepare doors to receive hardware. Fill surface depressions with metallic paste filler and grind to smooth uniform finish. Provide fixed astragal on inside of inactive leaf.

Install doors in accordance with SDI-100 except as amended in this section. Install doors plumb and square, and with maximum diagonal distortion of 1/16 inch.

C.13.2 Fiberglass Service Doors

At the Salt Brine Building, install fiberglass doors and accessories according to the manufacturer's instructions and as specified herein. For factory finished doors, restore finish before installation if fitting or machining is required at project site. Fit fiberglass doors accurately in frames. Shim as necessary.

Remove protective wrappings from doors. Clean fiberglass doors in accordance with the manufacturer's recommended procedure.

C.14 Frames

C.14.1 Steel Frames

Accurately form and cut mitered corners of welded type frames. Weld on inside surfaces. Grind welded joints to smooth uniform finish. Accurately cope and securely weld butt joints of mullions and transoms of glazed lights. Grind welded joints to smooth uniform finish according to the door schedules on the plan.

Provide removable mullions for double doors. Reinforce head sections where mullions occur.

Reinforce frames wider than 4 feet with 12 gauge formed steel channels weld in place, flush with top of frames. Reinforce and prepare frames to receive hardware. Reinforce jambs and heads of frames for doors which occur in glazed screens.

Place a minimum of 3 single mutes on single door frames and space equally along strike jambs.

Place minimum of 2 single bumpers on double door frames. Place on frame heads.

Provide jamb anchors in accordance with SDI-100. Weld floor jamb anchors in place. Fill surface depressions of hollow frames with metallic paste filler and grind to smooth finish.

Install door frames in accordance with SDI-100 except as amended in this section. Install hollow metal frames plumb and square, at locations shown on the plans with a maximum diagonal distortion of 1/16 inch. Ensure frames are securely and rigidly anchored to adjacent construction.

C.14.2 Fiberglass Frames

At the Salt Brine Building, install fiberglass frames and accessories according to the manufacturer's instructions and as specified herein. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

Place frames before construction of enclosing walls and ceilings.

In masonry construction, provide at least three wall anchors per jamb; install adjacent to hinge locations on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors. For openings 90 inches or more in height, install an additional anchor at hinge and strike jambs.

Remove protective wrappings from doors and frames. Clean fiberglass frame assemblies in accordance with the manufacturer's recommended procedure.

C.15 Window

Install window in the heated carpenter room in conformance to standard building practices.

C.16 Flashing

C.16.1 Fabricated Metal Units

Shop-fabricate work to greatest extent possible. Comply with details shown on the plans, applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations. Form exposed sheet metal work without excessive oil canning, buckling and tool marks, true to line and levels as indicated, and with exposed edges folded back to form hems.

Fabricate non-moving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder.

Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1" deep, filled with mastic sealant concealed within joints.

Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant in compliance with industry standards.

Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

C.16.2 Flashing Installation

Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual." Anchor units of work securely in place by methods indicated providing for thermal expansion of metal units. Conceal fasteners where possible and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.

Clean exposed metal surfaces and removing substances which might cause corrosion of metal or deterioration of finishes.

Protect flashings and sheet metal work during construction to ensure that completed work will be without damage or deterioration.

C.17 Warranty Work

Warranty work shall include all proper repairs or corrections made necessary by defective materials or inferior workmanship and does not include normal wear and tear. Contractor shall provide all necessary labor, material and equipment required.

Maintain insurance for performing warranty work as specified in standard spec 107.26 throughout the warranty period.

If warranty work causes damage to the building structures and all associated components, repair or replacement of the damage will be the responsibility of the contractor. Use replacement materials of the same kind specified in the original contract unless mutually agreed otherwise by the Milwaukee County Department of Public Works and the contractor.

All warranty work shall require a permit from the county. The county will provide contact information for obtaining a permit to the contractor.

Document all warranty work performed. Use the departments form DT2305 to provide this information to the county each time work is performed.

C.18 Remedial Work

Remedial work will be based on the result of manual surveys or evaluations. Perform remedial work in the same calendar year that the distresses were recorded. Remedial work to be performed and materials to be used will be the joint decision of the contractor and the engineer.

The contractor will have the first option to perform the remedial work. If, in the opinion of the engineer, the problem requires immediate attention for the safety of the public, and the contractor cannot perform the remedial work within five calendar days of the engineer's written authorization, the engineer may have the remedial work performed by other forces and at the contractor's expense.

Remedial work performed by other forces will not alter the requirements, responsibilities, or obligations of the warranty.

If remedial action work or elective/preventive action work performed by the contractor necessitates a corrective action to other components of the building structures, then such corrective action will be the responsibility of the contractor.

D Measurement

The department will measure Storage Building 1, Storage Building 2, Salt Brine Building, and Bins completed in accordance to the contract and accepted, as a single complete unit of work.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0102	Storage Building 1	LS
SPV.0105.0103	Storage Building 2	LS
SPV.0105.0104	Salt Brine Building	LS
SPV.0105.0105	Bins	LS

Payment is full compensation for designing, furnishing, constructing and installing each building structure as specified in this article; for all required submittals and shop drawings; for providing all manuals; for fabricating, transporting, unloading, and storing all materials; for coordinating inspections with the local building department and correcting all deficiencies; for preparing the foundation; for furnishing and placing all concrete; for site work; for all excavating, bedding, backfilling, and compacting; for designing, furnishing, installing, and removing all sheeting, shoring, and bracing; for furnishing, erecting, and installing all materials including the reinforced concrete walls and footings, precast concrete hollow core planks, concrete masonry units, fascia brick, mortar and grout, metal siding and ceiling, metal roofing, elastomeric sheet roofing, HVAC equipment and motors, all insulation, fascia, rake trim, floating ridge, eaves and gutters, downspouts, carrier pipes, sectional overhead doors and openers, service doors, windows, frames, hardware, reinforcing steel, bolts, anchors and fasteners, masonry and metal accessories, ceiling fans, trim, flashing, moisture and vapor barriers, expansion joints, caulk, sealant materials, concrete splash pads, and all other appurtenances as shown on the plans; for providing all coatings; for all galvanizing; for all sealing and fire stopping; for fabricating, erecting, and installing all structural steel including bearing plates, columns, joists, beams, lintels, and miscellaneous shapes and plates; for all welding; for all bolting; for providing and installing all plumbing materials and components including piping and

fittings, elbows, floor and roof drains, trap guards, hub drains, cleanouts, water hammer arrestors, backflow preventers, manholes and castings, vent flashings, water meter coordination, shop sink, eye wash station, fixtures and equipment, pipe wrap, and for making all connections; for furnishing and installing valves including ball, drain, butterfly, check, and gate; for furnishing and installing thermometers, press gauges, and strainers; for furnishing and installing all building sanitary sewerage, sanitary waste and vent materials, building storm drainage, storm and clear water waste and vent materials, and compressed air systems including piping and components; for furnishing and installing all hangers and supports including beam clamps; for all corrosive atmosphere coatings; for providing and installing all mechanical materials and components including piping and fittings, elbows, branch takeoffs, gas unit heater, electric unit heaters, electric water heaters, and for making all connections; for furnishing and installing all unions and flanges; for all lubrication; for furnishing and installing all sleeves; for furnishing and installing all building facility fuel piping; for natural gas service including setting of gas meters and work performed by the gas company; for furnishing and installing HVAC and plumbing identification; for all welding; for furnishing formliners and attaching formliners to forms; for forming and pouring test panels; for job mock-ups; for delivery of test panels and mock-ups to site; for producing the proposed smooth brick pattern surface treatment; for finishing and protecting the surface treatment and completed work; for concrete, brick, and block sealing; for all parging; for properly disposing of all surplus material, test panels, and mock-ups; for furnishing and applying concrete stain and paint; for preparing the concrete surface; for testing all necessary items including potable water; for performing all piping system leak tests; for disinfection of domestic water lines; for obtaining all necessary permits and associated fees and inspection costs; for providing all training; for frost protection; for control of water; for cleaning plumbing fixtures and trim; for providing and removing protective covers to prevent accumulation of dirt on units during balance of construction; for all remedial work; for the warranty and warranty bond; for performing warranty work; and for furnishing all labor, supervision, tools, equipment and incidentals necessary to complete the contract work.

94. Dewatering Catch Basin, SPV.0105.0106.

A Description

A.1 General

This special provision describes furnishing, constructing and installing a dewatering catch basin at the Milwaukee County Department of Public Works maintenance yard as shown on the plans.

This special provision includes:

- Pre-engineered, shop fabricated metal wall and sloped roof metal building.
- Structural-steel framing.
- Metal roof panels.
- Metal wall panels.
- Metal soffit panels.
- Accessories.

Related Requirements:

- Concrete – Set anchor rods provided by this section. Locate anchor rods based upon layout information from this section.
- Concrete- Footing/Foundation layout to be coordinated with work from this section.
- Utility Rough-Ins.
- Coordinate roof and wall appearance as specified herein, and with that of proposed adjacent buildings.

A.2. Action Submittals

Product Data: For each type of metal building system component.

Shop Drawings: For metal building system components. Include plans, elevations, sections, details, and attachments to other work. Shop drawings shall clearly show all metal building reactions for design of foundations.

Samples: For each type of exposed finish required.

Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data and calculations signed and sealed by the qualified professional engineer responsible for their preparation.

A.3 Informational Submittals

Welding certificates.

Manufacturer Accreditation: Statement that metal building system and components were designed and produced by a manufacturer accredited according to the International Accreditation Service's AC472.

Metal Building System Certificates: For each type of metal building system, from manufacturer.

- Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
 - a. Name and location of Project.
 - b. Order number.
 - c. Name of manufacturer.
 - d. Name of Contractor.
 - e. Building dimensions including width, length, height, and roof slope.
 - f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
 - g. Governing building code and year of edition.
 - h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, auxiliary loads (cranes), loads imposed on the structure by equipment and building use.

- i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
- j. Building-Use Category: Indicate category of building use and its effect on load importance factors.

Material test reports.

Source quality-control reports.

Field quality-control reports.

Warranties: Sample of special warranties.

A.4 Closeout Submittals

Maintenance data.

Execution and Closeout Requirements per Forward 45.

Project Record Documents: As Built Drawings and Specifications.

A.5 Quality Assurance

Manufacturer Qualifications: A qualified manufacturer and member of MBMA

- § Accreditation: According to the International Accreditation Service's AC472.
- § Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a qualified professional structural engineer who is licensed to practice structural engineering in the State of Wisconsin. This engineer shall seal and sign documents. This engineer shall submit documents and obtain all necessary approvals.

Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

Welding Qualifications: Qualify procedures and personnel according to the following:

- AWS D1.1/D1.1M, "Structural Welding Code - Steel"
- AWS D1.3, "Structural Welding Code - Sheet Steel"

Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.

Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

Preinstallation Conference: Conduct conference at Project site.

Provide components of metal building system all from one manufacturer.

A.6 Warranty

Special Warranty on Metal Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

- Finish Warranty Period: 20 years from date of Substantial Completion.

Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.

- Warranty Period: 20 years from date of Substantial Completion.

B Materials

B.1 Manufacturers

Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following or approved equal:

- American Buildings Company
- Butler Manufacturing Company
- CBC Steel Buildings
- Ceco Building Systems
- Chief Buildings; Division of Chief Industries, Inc.
- Elite Structures, Inc.
- Garco Building Systems
- Inland Buildings
- Nucor Building Systems
- Olympia Steel Building Systems
- Schulte Building Systems, LLP
- Star Building Systems
- VP Buildings; a United Dominion company
- Owner Approved Equals

B.2 Metal Building System Performance

Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

Structural Performance: Metal building systems shall be designed according to procedures in MBMA's "Metal Building Systems Manual."

- Design Loads: As required by MBMA's "Metal Building Systems Manual" and 2009 International Building Code.

- Deflection Limits: Design metal building system assemblies to withstand design loads with deflections no greater than the following:
 - a. Purlins and Rafters: Vertical deflection of 1/180 of the span.
 - b. Girts: Horizontal deflection of 1/180 of the span.
 - c. Metal Roof Panels: Vertical deflection of 1/240 of the span.
 - d. Metal Wall Panels: Horizontal deflection of 1/180 of the span.
 - e. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.
- Drift Limits: Engineer building structure to withstand design loads with drift limits no greater than the following:
 - a. Lateral Drift: Maximum of 1/200 of the building height.
- Metal panel assemblies shall withstand the effects of gravity loads and loads and stresses within limits and under conditions indicated according to ASTM E 1592.

Seismic Performance: Metal building systems shall withstand the effects of earthquake motions determined according to 2009 International Building Code.

Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

- Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C)] material surfaces.

Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 at test-pressure difference of 2.86 lbf/sq. ft. (137 Pa).

Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at a wind-load design pressure of not less than 2.86 lbf/sq. ft. (137 Pa).

B.3 Structural-Steel Framing

Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafter, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.

- General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly.
- Frame Configuration: Single gable
- Exterior Column Type: Tapered.
- Rafter Type: Uniform depth.

End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly.

Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating.

Bolts: Provide plain-finish bolts for structural-framing components that are primed or finish painted. Provide zinc-plated or hot-dip galvanized bolts for structural-framing components that are galvanized.

Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.

B.4 Metal Roof Panels

Manufacturer Standard Standing-Seam Metal Roof Panels: Formed with ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.

- Material: Zinc-coated (galvanized)] steel sheet, thickness as required for structural design.
 - a. Exterior Finish: Two-coat fluoropolymer].
 - b. Color: The finish color, texture, and pattern of the metal panels shall match the City of Wauwatosa Design Review Board samples and are to be approved by the engineer prior to ordering materials. At least 15 working days prior to the start of work, supply one 4-foot x 4-foot mock-up for approval by the engineer. At the project site, install a job mock-up using acceptable products and manufacturer approved installation methods. Include eave, ridge, gutter, gable and hip conditions. Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.

- Clips: Manufacturer's standard, fixed type fabricated from zinc-coated (galvanized) steel sheet.
- Joint Type: Mechanically seamed, folded according to manufacturer's standard.
- Panel Coverage: 16 inches (406 mm)
- Panel Height: 2 inches (51 mm)
- Uplift Rating: as required per structural design loads.

B.5 Metal Wall Panels

Manufacturer Standard Exposed-Fastener Metal Wall Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.

- Material: Zinc-coated (galvanized) steel sheet, thickness as necessary for structural design.
 - a. Exterior Finish: Two-coat fluoropolymer minimum.
 - b. The finish color, texture, and pattern of the metal panels shall match the City of Wauwatosa Design Review Board samples and are to be approved by the engineer prior to ordering materials. At least 15 working days prior to the start of work, supply one 4-foot x 4-foot mock-up for approval by the engineer. At the project site, install a job mock-up using acceptable products and manufacturer approved installation methods. Include eave, ridge, gutter, gable and hip conditions. Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required. Mock-up may be incorporated into final construction upon approval from the engineer.
- Major-Rib Spacing: 12 inches (305 mm) o.c.
- Panel Coverage: 36 inches (914 mm).
- Panel Height: 1.5 inches (38 mm).

B.6 Metal Soffit Panels

General: Provide factory-formed metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps. Include accessories required for weathertight installation.

Metal Soffit Panels: Match material of metal roof panels.

- Finish: Match finish and color of metal roof panels

B.7 Accessories

General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.

- Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.

Flashing and Trim: Formed from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match adjacent metal panels.

Gutters: 4" Formed from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- (2438-mm-) long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."

- Gutter Supports: Fabricated from same material and finish as gutters.
- Strainers: Bronze, copper, or aluminum wire ball type at outlets.

Downspouts: 4" Formed from 0.022-inch (0.56-mm) nominal-thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- (3-m-) long sections, complete with formed elbows and offsets.

- Mounting Straps: Fabricated from same material and finish as gutters.

Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

B.8 Fabrication

General: Design components and field connections required for erection to permit easy assembly.

- Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
- Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.

Primary Framing: Shop fabricate framing components to size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.

Secondary Framing: Shop fabricate framing components to size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.

Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

B.9 Formliner

Use reusable form liners that are made of highway strength urethane or lightweight one time use elastomeric foam form liners that attach easily to the forming system, and do not compress more than 1/4-inch when poured at a rate of 10 vertical feet/hour.

Formliner shall have a smooth, horizontal brick pattern with round joints. Individual bricks shall be rectangular in shape separated by 1/2-inch wide horizontal and vertical mortar lines. Individual brick dimensions shall have a length of 7 1/2-inches and a height of 2 1/2-inches. Relief of the formliner shall be 1/4-inches.

Use a release agent that is compatible with the form liner and coloring materials.

Wall ties shall have set "break-backs" at a minimum of 3/4-inches from the finished concrete surface.

B.10 Concrete Staining

Use concrete stain manufactured for use on exterior concrete surfaces. Use the following products, or equal as approved by the engineer, as part of the finish system:

Tri-Sheen Acrylic by TK Products
TK-5272 Tri-Sheen Pigmented Stain
B-97-200 Series Concrete Stain by Sherwin Williams
(*Natural Look)

B.11 Paint

Furnish paint, varnish, stain enamel, lacquer and fillers manufactured by PPG, Sherwin-Williams, Tnemec, or equal as approved by the engineer. Supply high quality paint accessory materials approved by the manufacturer such as linseed oil, shellac, turpentine and other materials not specifically indicated herein but required to achieve the finishes specified.

Paints shall be ready-mixed except field catalyzed coatings. Pigments shall be fully ground maintaining a soft paste consistency, capable of being readily and uniformly dispersed to a complete homogeneous mixture. Paints shall have good flowing and brushing properties and be capable of dry or curing free of streaks or sags.

Coatings shall be applied according to the following finishing schedule:

- a. Ferrous metals interior and exterior, excluding interior wellhead piping
 - 1 coat – S-W Kem Bond HS Universal Metal Primer B50Z series at 2.0 – 5.0 mils DFT.
 - 2 coats – S-W Industrial Enamel HS B54 Z series at 2.0 – 4.0 mils DFT per coat.
- b. Concrete Walls, interior
 - 1 coat – S-W PrepRite Masonry Primer B28W300 at minimum 3 mils DFT.
 - 2 coats – S-W Pro Industrial Waterbased Epoxy Eg-Shel K45 series at minimum 1.5 mils DFT per coat.
- c. Concrete Masonry Units, interior and exterior
 - 1 coat – S-W Heavy Duty Blockfiller B42W46 at 10 –18 mils DFT (calculated).
 - 2 coats – S-W Pro Industrial Waterbased Epoxy Eg-Shel K45 series at minimum 1.5 mils DFT per coat.
- d. Aluminum and Galvanized metals, interior and exterior
 - 2 coats META Latex B42 series at 3.0 to 4.0 mils.

The color of the paint shall match the City of Wauwatosa Design Review Board samples and are to be approved by the engineer prior to ordering materials. At least 15 working days prior to the start of work, supply paint chip samples of each color for approval by the engineer.

The lower 8 feet of the Dewatering Catch Basin exterior walls shall be painted to match the color of the fascia brick on Storage Building 1 and Storage Building 2.

B.12 Concrete

B.12.1 Cast in Place

Proportion, mix, and furnish concrete in accordance to standard spec 501.

B12.2 Concrete Curb and Gutter

Proportion, mix, and furnish concrete in accordance to standard spec 601.

B.13 Sewer**B.13.1 General**

All materials and work required to connect the sanitary sewer lateral will conform to the Standard Specifications for Sewer and Water.

B.13.2 Lateral Connection

Pipe material shall be PVC SDR-35 conforming to ASTM D-3034, with rubber gasket joints conforming to ASTM F-477.

B.13.3 Joints

Joints on sanitary sewers between dissimilar pipe shall be either a non-shear coupling as manufactured by DFW/HPI or shall be made with flexible mechanical compression joint coupling conforming to ASTM C-594 Type B with stainless steel bands and shear ring conforming to ASTM A-167 as manufactured by Joints, Inc. (Calder) of Gardena, CA; Fernco Joint Sealer Co. of Ferndale, MI., or equal and in addition, using a transitional bushing conforming to ASTM C-594 Type B when pipe with different outside diameters are to be connected.

Encased the coupling in a minimum of 6 inches of concrete around the entire repair coupling and at least 12 inches from each side of the joint. Joints for reconnecting laterals of similar PVC SDR-35 pipe shall be made with new PVC SDR-35 gasketed pipe.

The cost of connecting dissimilar pipe materials with nonshear flexible compression coupling is incidental to the cost of sanitary sewer pipe.

B.14 Dense Graded Base

Furnish aggregate in accordance to standard spec 305.

B.15 Trench Drain

Furnish trench drain in accordance to the plans.

B.16 Manhole and Grate

Furnish manholes and grates in accordance to standard spec 611 and as specified in the plans.

B.17 Electrical

Furnish electrical items in accordance to standard spec 611 and as specified in the plans.

C. Construction**C.1 Erection of Structural Framing**

Erect metal building system according to manufacturer's current written erection instructions and erection drawings specific to this project.

Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this section. Maintain structural stability of frame during erection.

Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

- Set plates for structural members on wedges, shims, or setting nuts as required.
- Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
- Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

- Level and plumb individual members of structure.
- Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.

- Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for bolt type and joint type specified.

e. Joint Type: Snug tightened or pretensioned.

Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.

- Provide rake or gable purlins with tight-fitting closure channels and fasciae.
- Locate and space wall girts to suit openings such as doors and windows.
- Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.

Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.

- Tighten rod and cable bracing to avoid sag.
- Locate interior end-bay bracing only where indicated.

Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

C.2 Metal Panel Installation, General

General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

- Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
 - a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
- Install metal panels perpendicular to structural supports unless otherwise indicated.
- Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
- Locate and space fastenings in uniform vertical and horizontal alignment.
- Locate metal panel splices over, but not attached to, structural supports with end laps in alignment.
- Lap metal flashing over metal panels to allow moisture to run over and off the material.

Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.

- Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line. Lap in "shingle fashion" to shed water.

Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants recommended by metal panel manufacturer.

- Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.

C.3 Metal Roof Panel Installation

General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.

- Install ridge caps as metal roof panel work proceeds.
- Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.

Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.

- Install clips to supports with self-drilling or self-tapping fasteners.
- Install pressure plates at locations indicated in manufacturer's written installation instructions.
- **Seamed Joint:** Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
- Rigidly fasten eave end of metal roof panels and allow ridge end free movement due to thermal expansion and contraction. Predrill panels for fasteners.
- Provide metal closures at each side of ridge caps.

Lap-Seam Metal Roof Panels: Fasten metal roof panels to supports with exposed fasteners at each lapped joint, at location and spacing recommended by manufacturer.

- Provide metal-backed sealing washers under heads of exposed fasteners bearing on weather side of metal roof panels.
- Provide sealant tape at lapped joints of metal roof panels and between panels and protruding equipment, vents, and accessories.
- Apply a continuous ribbon of sealant tape to weather-side surface of fastenings on end laps and on side laps of nesting-type metal panels, on side laps of ribbed or fluted metal panels, and elsewhere as needed to make metal panels weatherproof to driving rains.

- At metal panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with butyl-rubber sealant and fastened together by interlocking clamping plates.

Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

C.4 Metal Wall Panel Installation

General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.

- Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
- Shim or otherwise plumb substrates receiving metal wall panels.
- When two rows of metal panels are required, lap panels 4 inches (102 mm) minimum.
- When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
- Rigidly fasten base end of metal wall panels and allow eave end free movement due to thermal expansion and contraction. Pre-drill panels.
- Flash and seal metal wall panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
- Install screw fasteners in predrilled holes.
- Install flashing and trim as metal wall panel work proceeds.
- Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated; or, if not indicated, as necessary for waterproofing.
- Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
- Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

C.5 Metal Soffit Panel Installation

Provide metal soffit panels the full width of soffits. Install panels perpendicular to support framing.

Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.

C.6 Accessory Installation

General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

- Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

- Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
- Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches (914 mm) o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1524 mm) o.c. in between.

- Provide elbows at base of downspouts to direct water away from building.

Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

C.7 Field Quality Control

Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

Tests and Inspections:

- High-Strength, Field-Bolted Connections: Connections shall be inspected during installation according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- Welded Connections: In addition to visual inspection, field-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.

Product will be considered defective if it does not pass tests and inspections.

Prepare test and inspection reports.

C.8 Formliner

Supply reusable form liner having a smooth, horizontal brick pattern with round joints. Clean the form liner prior to each pour and ensure that it is free of any build-up. Visually inspect each liner for blemishes or tears, and repair if necessary per manufacturer's recommendations.

Place the formliner on the outside wall faces of the Dewatering Catch Basin. The smooth, horizontal brick pattern shall extend a minimum of 6" below finished grade.

Apply form release agent per manufacturer's recommendations.

Attach liner securely to forms in accordance with manufacturer's recommendations to maintain a continuous smooth, horizontal brick pattern with round joints. Coordinate wall ties with form liner and form manufacturer, e.g., diameter, size, and frequency where applicable.

Grind or fill pouring blemishes.

C.9 Concrete Staining

C.9.1 Preparation of Concrete Surfaces

Match or exceed the stain manufacturer's minimum recommended curing time of the concrete or 28 days, whichever is greater before applying base color stain.

Prior to staining, make sure all areas to be stained are clean and dry.

C.9.2 Staining Concrete Surfaces

Furnish, prepare, apply, cure and store all materials according to product manufacture directions specified for the type and condition of application required.

Apply the stain in strict conformance with product manufacture requirements.

Apply the concrete stain when the temperature of the concrete surface is 45 degrees F or higher, or as specified by the manufacturer.

The final color of the concrete following application of the stain system shall match the fascia brick color for Storage Building 1, Storage Building 2 and the approved City of Wauwatosa Design Review Board sample.

Do not begin the staining until adjacent operations are completed to a point where this work can begin without receiving damage or blowing dust. Where this work is adjacent to exposed paved areas, provide temporary covering protection from overspray or splatter.

C.9.3 Surfaces to be Coated

Apply the stain to the smooth brick face concrete walls of Storage Building 1 and Storage Building 2. Stain only the outside vertical face of the concrete walls. Do not apply stain to the mortar lines and any horizontal surfaces.

C.10 Test Panel

At least 15 working days prior to the start of forming the concrete walls, prepare and deliver to the field office a 4-foot by 4-foot concrete test panel. Cast the test panel with the proposed formliner and apply stain using the same materials and in the same method as proposed for the concrete walls. The pattern, final color, and finish shall match the City of Wauwatosa Design Review Board samples and are to be approved by the engineer prior to placement of any concrete or stain in the field.

Additionally, the engineer will evaluate the stain application and color, the adequacy of the product, and the forming methods to yield the desired results. The engineer shall inspect condition of the test panel and its dimensional quality. All voids and irregularities shall be repaired using the same methods as on the final concrete walls. The engineer will evaluate the test panel for definition and consistency. If the test panel is accepted the workmanship becomes the standard for the balance of the contractors work and incorporation into the final concrete walls.

If the test panel is not accepted, the contractor shall prepare another test panel and repeat the process, using either a different product or different methods. This procedure shall be repeated until the test panel is accepted by the engineer.

C.11 Paint

C.11.1 Preparation

Deliver paint materials in sealed original labeled containers, bearing manufacturer's name, type of paint, brand name, color designation and instructions for mixing and/or reducing. Provide adequate storage facilities. Store paint materials at minimum ambient temperature of 45 degrees F in a well ventilated area. Take precautionary measures to prevent fire hazards and spontaneous combustions.

Use an electronic moisture meter to measure moisture content of surfaces. Do not apply finishes unless moisture contents of surfaces are below following maximums:

- a. Plaster and gypsum wallboard: 12 percent
- b. Masonry, concrete and concrete block: 12 percent
- c. Interior located wood: 15 percent

Ensure surface temperatures and the surrounding air temperature is above 50 degrees F before applying finishes. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above 50 degrees F for 24 hours before, during and 48 hours after application of finishes. Provide minimum 25-foot candles of lighting on surfaces to be finished.

Thoroughly examine surfaces scheduled to be painted prior to commencement of work. Notify the engineer of any condition that may potentially affect proper application. Do not commence until such defects have been corrected. Correct defects and deficiencies in surfaces which may adversely affect work of this section.

Protect other surfaces from paint and damage. Repair damage as a result of inadequate or unsuitable protection. Furnish drop cloths, shield, and protective equipment to prevent spray or droppings from fouling surfaces not being painted and in particular, surfaces within storage and preparation areas.

Place cotton waste, cloths, and materials which may constitute a fire hazard in closed metal containers and remove daily from site.

Remove electrical plates, surface hardware, fittings and fastenings, prior to painting operations. These items are to be carefully stored, cleaned, and replaced on completion or work in each area. Do not use solvent to clean hardware that may remove permanent lacquer finish.

Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry completely.

Remove surface contamination from aluminum surfaces requiring a paint finish by steam, high-pressure water or solvent washing. Apply etching primer or acid etch. Apply paint immediately if acid etching.

Remove dirt, powdery residue and foreign matter from asbestos-cement, board, siding, piping, and shingles. Paint both sides immediately when applicable.

Remove dirt, oil, grease and sand if necessary to provide adhesion key, when asphalt, creosote or bituminous surfaces require a paint finish. Apply latex based, compatible sealer or primer.

Remove dirt, grease and oil from canvas and cotton insulated coverings.

Remove contamination, acid etch and rinse new concrete floors with clear water. Ensure required acid-alkali balance is achieved. Allow to thoroughly dry.

Remove contamination from copper surfaces requiring paint finish by steam, high-pressure water or solvent washing. Apply vinyl etch primer or acid etch. Apply paint immediately if acid etching.

Remove contamination from copper surfaces required to be oxidized. Apply oxidizing solution of copper acetate and ammonium chloride in acetic acid. Rub on repeatedly for correct effect. Once attained, rinse surfaces well with clear water and allow to dry.

Remove surface contamination and oils from galvanized surfaces and wash with solvent. Apply coat of etching type primer.

Remove surface contamination and oils from zinc coated surfaces and prepare for priming in accordance with metal manufacturer's recommendations.

Remove dirt, loose mortar, scale, powder and other foreign matter from concrete and concrete block surfaces which are to be painted or to receive a clear seal. Remove oil and grease with a solution of non-hydrocarbon solvent, rinse well and allow to thoroughly dry.

Remove stains from concrete and concrete block surfaces caused by weathering of corroding metals with a solution of sodium metasilicate after being thoroughly wetted with water. Allow to thoroughly dry.

Fill hairline cracks, small holes and imperfections on plaster surfaces with patching plaster. Smooth off to match adjacent surfaces. Wash and neutralize high alkali surfaces where they occur.

Remove grease, rust, scale, dirt and dust from steel and iron surfaces. Remove heavy coatings of scale by wire brushing, sandblasting or any other necessary method. Ensure steel surfaces are satisfactory before paint finishing.

Clean unprimed steel surfaces by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Prime surfaces to indicate defects, if any. Paint after defects have been remedied.

Sand and scrape shop primed steel surfaces to remove loose primer and rust. Feather out edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Prime steel including shop primed steels.

Prior to finishing glue laminated beams, wash down surfaces with solvent and remove grease and dirt.

C.11.2 Application

Apply each coat per Section B.11 at proper consistency. Each coat of paint is to be slightly darker than preceding coat. Sand lightly between coats to achieve required finish. Do not apply finishes on surfaces that are not sufficiently dry. Allow each coat of finish to dry before following coat is applied, unless directed otherwise by manufacturer. Where clear finishes are required, ensure tint fillers matchwood. Work fillers well into the grain before set. Wipe excess from the surface.

As work proceeds and upon completion, promptly remove paint where spilled, splashed or spattered. During progress of work keep, premises free from any unnecessary accumulation of tools, equipment, surplus materials and debris. Upon completion of work, leave premises neat and clean to the satisfaction of the engineer.

As directed by the engineer, leave on premises approximately one gallon of each color used. Containers shall be tightly sealed and clearly labeled for identification.

C.11.3 Mechanical and Electrical Equipment

Painting and finishing requirements, color-coding, identification banding of equipment, ducting, piping and conduit shall be in conformance with NR 811.32(6). Remove grilles, covers and access panels for mechanical and electrical systems from location and paint separately. Prime and paint insulated and bare pipes, conduits, boxes, insulated and bare ducts, hangers, brackets, collars and supports, except where items are plated or covered with a pre-finished coating.

Replace identification markings on mechanical or electrical equipment when painted over or spattered.

Paint exposed conduit and electrical equipment occurring in finished areas. Match the color and texture to adjacent surfaces. Paint both sides and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.

Color-code equipment, piping, conduit and exposed ductwork in accordance with requirements indicated. Color banding and identification shall include flow arrows, naming, numbering, etc.

C.11.4 Structural Steel

C.11.4.1 Shop Painting

All structural steel except where galvanized shall be given one shop coat of primer with a minimum thickness of 2.0 mils compatible with the finish coats provided in Section B.5.5 Paint, after fabrication and cleaning but before shipping.

All steel work shall be thoroughly cleaned, by sandblasting in accordance to Steel Structures Painting Council Specification SP-6 before shop painting. Paint shall be applied immediately after blast cleaning, thoroughly and evenly and well worked into joints and other open spaces. Paint shall be applied only to dry surfaces. Primer shall be compatible with finish coat as specified in Section B.11 Paint.

C.11.4.2 Field Painting

After erection, thoroughly clean the entire structural steel surface of all dirt, grease, rust, welding slag, or other foreign matter. Touch up affected areas as specified herein.

C.12 Plumbing

Perform all plumbing work in accordance with requirements of the Wisconsin Administrative Code. The work shall be inspected and approved by the local building department. Install all plumbing work as shown on the plans and as specified herein.

C.13 Concrete

C.13.1 General

Install all required footings, foundations, slabs, and/or other required substructures or supports at the required elevations on properly prepared subgrade, as required for the erection of each complete building structure.

C.13.2 Cast in Place

The contractor is responsible for checking all dimensions and accuracy of the form work and reinforcing steel prior to placing the concrete. Make minor adjustments necessary in the footings and foundation to accomplish a vertical building axis and level horizontal foundation lines. Follow the normal and recommended practice for the placing and protection of the concrete in accordance to standard spec 501.

C.13.3 Concrete Curb and Gutter

Install all concrete curb and gutter in accordance to standard spec 601.

C.14 Dense Graded Base

Construct aggregate in accordance to standard spec 305.

C.15 Trench Drain

Construct trench drain in accordance to the plans.

C.16 Manhole and Grate

Construct manholes and grates in accordance to standard spec 611 and as specified in the plans.

B.17 Electrical

Construct electrical items in accordance to standard spec 611 and as specified in the plans.

D Measurement

The department will measure Dewatering Catch Basin completed in accordance to the contract and accepted, as a single complete lump sum unit of work.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0106	Dewatering Catch Basin	LS

Payment is full compensation for designing, furnishing, constructing and installing the building structure as specified in this article; for all required submittals and shop drawings; for providing all manuals; for fabricating, transporting, unloading, and storing all materials; for coordinating inspections with the local building department and correcting all deficiencies; for preparing the foundation; for furnishing and placing all concrete; for site work; for all excavating, bedding, backfilling, and compacting; for furnishing, erecting, and installing all materials including the reinforced concrete walls and footings, metal roofing, fascia, gutters, downspouts, hardware, reinforcing steel, bolts, anchors and fasteners, masonry and metal accessories, expansion joints, caulk, sealant materials, and all other appurtenances as shown on the plans; for furnishing and installing trench drain; for furnishing and installing yard hydrants, and for making all connections; for providing all coatings; for all galvanizing; for fabricating, erecting, and installing all structural steel, columns, joists, beams, and miscellaneous shapes and plates; for all welding; for all bolting; for providing and installing all manholes and castings, and for making all connections; for furnishing and installing all sanitary sewer pipe and for making connections; for furnishing and installing all electrical items: for furnishing formliners and attaching formliners to forms; for forming and pouring test panels; for job mock-ups; for delivery of test panels and mock-ups to site; for producing the proposed smooth brick pattern surface treatment; for finishing and protecting the surface treatment and completed work; for properly disposing of all surplus material, test panels, and mock-ups; for furnishing and applying concrete stain and paint; for preparing the concrete surface; for obtaining all necessary permits and associated fees and inspection costs; for control of water; for all remedial work; for the warranty and warranty bond; for performing warranty work.

95. Common Electrical Work Storage Building 1, Item SPV.0105.1025; Common Electrical Work Storage Building 2, Item SPV.0105.1026; Common Electrical Work Salt Brine Building, Item SPV.0105.1027.

A Description

This special provision describes the furnishing and installing electrical materials in buildings and selected exterior circuits.

A.1 Limits of Responsibility

The limits of electrical work for Storage Building 1 and Storage Building 2 with shelter area include the interior and extends 5'-0" beyond the face of the building at grade. The limits of electrical work for the Salt Brine Building include the interior and extend to and includes the wiring and raceway to the scale along with the wiring, raceway and controls extending to the salt conveyor and to 5'-0" beyond the face of the salt dome at grade for the lighting, fans and door operator. Wiring, raceway and controls included herein for parking lot and DPW yard lighting is limited to the interior and up to 5'-0 from the face of the respective building wall at grade. All parking lot and DPW yard lighting poles, luminaires, pullboxes along with wiring and raceway beyond the 5'-0" limits as noted above, is separately quantified and is not included herein.

A.2 Reference Standards

ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
ETL	Electrical Testing Laboratories, Inc.
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
UL	Underwriters Laboratories Inc.
DSPS	Wisconsin Department of Safety and Professional Services
DOT	State of Wisconsin Standard Specifications for Highway and Structure Construction

A.3 Regulatory Requirements

All work and materials are to conform in every detail to applicable rules and requirements of the Wisconsin State Electrical Code (SPS 316), the National Electrical Code (NFPA 70), State of Wisconsin Standard Specifications for Highway and Structure Construction other applicable National Fire Protection Association codes, the National Electrical Safety Code, and present manufacturing standards (including NEMA).

Perform all electrical work under the direction of a currently certified State of Wisconsin Certified Master Electrician.

A.4 Quality Assurance

Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or engineering parameters from those indicated on the contract documents, the contractor is responsible for all costs involved in integrating the equipment or accessories into the system and the assigned space, and for obtaining the performance from the system into which these items are placed.

Manufacturer references used herein are intended to establish a level of quality and performance requirements unless more explicit restrictions are stated to apply.

All materials shall be listed by and shall bear the label of an approved electrical testing laboratory. If none of the approved electrical testing laboratories has published standards for a particular item, then other national independent testing standards, if available, applicable, and approved by the engineer, shall apply and such items shall bear those labels. Where one of the approved electrical testing laboratories has an applicable system listing and label, the entire system shall be so labeled.

The following laboratories are approved for providing electrical product safety testing and listing services as required in these specifications:

Underwriters Laboratories Inc.
Electrical Testing Laboratories, Inc

A.5 Intent

Furnish and install all the necessary materials, apparatus, and devices to complete the electrical equipment and systems installation herein specified, except such parts as are specifically exempted herein.

If an item is either called for in the specifications or shown on the plans, it shall be considered sufficient for the inclusion of said item in this contract. If a conflict exists within the specifications or exists within the drawings, furnish the item, system, or workmanship, which is the highest quality, largest, or most closely fits the intent of the plans as determined by the engineer.

It must be understood that the details and drawings are diagrammatic. Verify all dimensions at the site and be responsible for their accuracy.

All sizes as given are a minimum except as noted.

Materials and labor shall be new, first class, and workmanlike, and shall be subject at all times to the department's inspections, tests and approval from the commencement until the acceptance of the completed work.

Whenever a particular manufacturer's product is named, it is intended to establish a level of quality and performance requirements unless more explicit restrictions are stated to apply.

A.6 Omissions

No later than ten days before bid opening, call the attention of the department to any materials or apparatus the believed to be inadequate and to any necessary items of work omitted.

A.7 Submittals

Submit for all equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number, example "B.1 Wiring and

Cable”. Mark general catalog sheets and drawings to indicate specific items being submitted and proper identification of equipment by name and/or number, as indicated in the contract documents. Use only a black indelible marker to denote the submitted item. Do not use a “highlighter” to identify the submitted item as some colors are not registered by copiers. Failure to do this may result in the submittal(s) being returned to the contractor for correction and resubmission. Failing to follow these instructions does not relieve the contractor from the requirement of meeting the project schedule.

On request from the department, the successful bidder shall furnish additional drawings, illustrations, catalog data, performance characteristics, etc.

Group submittals to include complete submittals of related systems, products, and accessories in a single submittal. Mark dimensions and values in units to match those specified. Include wiring diagrams of electrically powered equipment.

The submittals must be approved before fabrication is authorized.

Submit sufficient quantities of submittals to allow the following distribution:

Operating and Maintenance Manuals	2 copies
Milwaukee County Department of Public Works	1 copy
Engineer	1 copy

A.8 Work By Other Trades

Every attempt has been made to indicate in this specifications and drawings all building electrical work required. However, there may be additional specific paragraphs in other specifications and addenda, and additional notes on drawings which pertain to building electrical work, and thus those additional requirements are hereby made a part of these specifications and drawings.

Electrical details on drawings for equipment to be provided by others are based on preliminary design data only. This contractor shall lay out the electrical work and shall be responsible for its correctness to match equipment actually provided by others.

B Materials

B.1 Wiring and Cable

Conductor sizes are based on copper. Wire #12 AWG is the smallest sized wire for power and lighting. Install all wire in conduit. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet project conditions. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

All conductors shall be copper. All conductors shall be stranded. Stranded conductors may only be terminated with UL OR ETL Listed type terminations or methods: e.g. stranded conductors may not be wrapped around a terminal screw but must be terminated with a crimp type device or must be terminated in an approved back wired method.

Insulation shall have a 600 volt, 90 Deg C rating. Insulation shall be:

- Building Wire: Single conductor, THHN/THWN-2, XHHW-2 insulation.
- Service Entrance (sized per 75 Deg C Table): Single conductor or multi-conductor, Type XHHW-2 insulation for services entrance conductors routed from exterior source to interior termination location.
- Underground Exterior: Single conductor or multi-conductor, XHHW-2.

B.2 Wiring Connectors

Split Bolt Connectors: Not acceptable.

Solderless Pressure Connectors: High copper alloy terminal. May be used only for cable termination to equipment terminals. Not approved for splicing.

Twist Type Wire Connectors: Solderless twist type spring connector (wire-nut) with insulating cover for copper wire splices and taps. Use for conductor sizes 10 AWG and smaller. The manufacturer's wire fill capacity must be followed.

All wire connectors used in exterior pull boxes shall be gel filled twist connectors or a connector designed for damp and wet locations. Gel filled twist type connectors can be used for copper conductor sizes 6 AWG and smaller for lighting applications. The manufacturer's wire fill capacity must be followed.

Splicing underground is NOT acceptable. Any splicing underground shall be approved in writing by the engineer and shall utilize an epoxy kit to completely enclose and seal the splice.

Mechanical Connectors: Bolted type tin-plated; high conductivity copper alloy; spacer between conductors; beveled cable entrances.

Compression (crimp) Connectors: Long barrel; seamless, tin-plated electrolytic copper tubing; internally beveled barrel ends. Connector shall be clearly marked with the wire size and type and proper number and location of crimps. Connector must be installed with a crimper tool listed for use with the manufacturer and type of compression connector.

Insulation Piercing Connectors: Molded insulated body, copper teeth, wrench tightened, UL 486B Listed. May be used only for connection of a tap conductor in run and tap type applications when main conductor is 8 AWG and larger.

B.3 Grounding Rod Electrode

Material: Copper-clad steel. Diameter: 3/4 inch (19 mm) minimum. Length: 10 feet (3.5 m) minimum. Rod shall be driven at least 9' 6" deep. Connection to grounding electrode shall be via an exothermic weld. Grounding electrode conductors shall be stranded copper size as shown or as required by NFPA 70, whichever is larger.

B.4 Grounding Electrode Conductor

Grounding electrode conductor shall be copper. Aluminum is not allowed. Size is as shown on the drawings or as required by the NEC, whichever is larger. Provide connection to the water service, foundation reinforcing and ground rods.

Mechanical connections shall be accessible for inspection and checking. No insulation shall be installed over mechanical ground connections. Ground connection surfaces shall be cleaned and all connections shall be made so that it is impossible to move them.

Attach grounds permanently before permanent building service is energized. Terminate each grounding conductor on its own terminal lug. Sharing a single lug by multiple conductors is not allowed. All grounding electrode conductors and individual grounding conductors shall be installed in PVC conduit, in exposed locations.

B.5 Hangers and Supports

Support Channel: Steel, Galvanized, Enameled or other corrosion resistant. Hardware: Corrosion resistant.

Minimum sized threaded rod for supports shall be 3/8" for trapezes and single conduits 1-1/4" and larger, and 1/4" for single conduits 1" and smaller. Conduit clamps, straps, supports, etc., shall be steel or malleable iron. One-hole straps shall be heavy duty type. All straps shall have steel or malleable backing plates when rigid steel conduit is installed on the interior or exterior surface of any exterior building wall.

Hangers and supports in the Brine Room of the Salt Brine Building shall be PVC coated.

B.6 Raceway and Boxes

B.6.1 Rigid Metal Conduit (Rmc) and Fittings

Conduit: Heavy wall threaded, galvanized steel, schedule 40.

Fittings and Conduit Bodies: Use all steel threaded fittings and conduit bodies.

B.6.2 PVC Coated Rigid Metal Conduit

PVC Externally Coated Conduit: Rigid heavy wall, schedule 40, steel conduit with external 40 mil (0.1 mm) PVC coating. Conduit must be hot dipped galvanized inside and out including threads. The PVC coating bond to the galvanized steel conduit shall be stronger than the tensile strength of the coating itself.

Fittings and Conduit Bodies: Threaded type, material to match conduit. PVC coated fittings and couplings shall have specially formed sleeves to tightly seal to conduit PVC coating. The sleeves shall extend beyond the fitting or coupling a distance equal to the pipe outside steel diameter or two inches (50 mm) whichever is greater.

B.6.3 Intermediate Metal Conduit (Imc) and Fittings

Conduit: Galvanized steel, threaded.

Fittings and Conduit Bodies: Use all steel threaded fittings and conduit bodies.

B.6.4 Electrical Metallic Tubing (Emt) and Fittings

Conduit: Steel, galvanized tubing.

Fittings: All steel, set screw, concrete tight. No push-on or indenter types permitted.

Conduit Bodies: All steel threaded conduit bodies.

B.6.5 Liquidtight Flexible Metal Conduit (Lfmc) and Fittings

Conduit: flexible, steel, galvanized, spiral strip with an outer Liquidtight, nonmetallic, sunlight-resistant jacket.

Fittings and Conduit Bodies: ANSI/NEMA FB 1, compression type. There shall be a metallic cover/insert on the end of the conduit inside the connector housing to seal the cut conduit end.

B.6.6 Rigid Polyvinyl Chloride Conduit (Pvc) and Fittings

Conduit: Rigid non-metallic conduit, Schedule 40 PVC minimum, Listed, sunlight resistant, rated for 90° C conductors.

Fittings and Conduit Bodies: NEMA TC 2, Listed.

B.6.7 Junction Boxes

Interior Sheet Metal Boxes: code gauge galvanized steel, screw covers, flanged and spot welded joints and corners.

Interior Sheet Metal Boxes Larger Than 12 Inches (300 mm) in any dimension shall have a hinged cover or a chain installed between box and cover.

Exterior Boxes and Wet Location Installations: NEMA Type 4 and Type 6, flat-flanged, surface-mounted junction box, UL listed as raintight. Galvanized cast iron and cover with ground flange, neoprene gasket, and stainless steel cover screws. Box to be listed in the WisconDOT Qualified Product List and shall be provided with an anti-corrosion coating.

Fiberglass, Quazite or Concrete Handholes with weatherproof cover of non-skid finish shall be used for underground installations. Cover shall identify system serviced.

Box extensions and adjacent boxes within 48" of each other are not allowed for the purpose of creating more wire capacity.

Junction boxes 6" x 6" or larger size shall be without stamped knock-outs.

Wireways shall not be used in lieu of junction boxes.

B.6.8 Outlet Boxes

Sheet Metal Outlet Boxes: galvanized steel, with stamped knockouts.

Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 3/8 inch male fixture studs where required.

Concrete Ceiling Boxes: Concrete type.

Cast Boxes: Cast ferroalloy, or aluminum type deep type, gasketed cover, threaded hubs.

B.6.9 General

All steel fittings and conduit bodies shall be galvanized.

No cast metal or split-gland type fittings permitted.

Mogul-type condulets larger than 2 inch (50 mm) not permitted except as approved or detailed.

All condulet covers must be fastened to the condulet body with screws and be of the same manufacture.

Wireways, gutters and c-condulets shall not be used in lieu of pull boxes and condulets.

All boxes shall be of sufficient size to provide free space for all conductors enclosed in the box and shall comply with NEC requirements.

B.7 Raceway and Wiring Identification Materials

Labels: All labels shall be permanent, and machine generated. NO HANDWRITTEN OR NON-PERMANENT LABELS ARE ALLOWED.

All wiring labels shall be white/transparent vinyl or vinyl-cloth, self-laminating, wraparound type. Flag type labels are not allowed. The labels shall be of adequate size to accommodate the circumference of the cable being labeled and properly self-laminate over the full extent of the printed area of the label.

Tape (wiring phase identification only): Scotch #35 tape in appropriate colors for system voltage and phase.

Nameplates: Engraved three-layer laminated plastic. Normal system shall use nameplates with black letters on white background, emergency system (NEC 700) shall use white letters on red background, legally required standby system (NEC 701) shall use white letters on blue background, and optional standby system (NEC 702) shall use white letters on yellow background.

Adhesive type labels not permitted except for identification of wires, wiring devices (device plates), 8" square and smaller junction boxes, and control devices.

B.8 Dry Type General Purpose Transformers

Dry Type General Purpose Transformers: Factory-assembled, air cooled, dry type general purpose two winding transformers; ratings as shown on the Drawings.

Transformers shall meet the energy efficiency requirements of the Energy Policy Act of 2005. Efficiency shall be no less than the Class 1 efficiency levels listed in Table 4-2 of NEMA Standard TP-1-2002.

Insulation system shall be rated at 220 degrees C.

Winding temperature rise shall be rated at 150 degrees C above a 40 degree C ambient.

Case temperature shall not exceed 50 degrees C rise above a 40 degrees C ambient at its warmest point.

Winding Taps, Transformers 15 KVA and Larger: Four 2-1/2 percent taps, two above and two below rated voltage, full capacity taps on primary winding.

Sound Levels: Maximum sound levels shall be as follows:

<u>KVA</u> <u>Rating</u>	<u>Sound</u> <u>Level</u>
0-9	40 dB
10-50	45 dB
51-150	50 dB
151-300	55 d
301-500	60 dB
501-700	62 dB

Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap sized to meet NEMA and UL standards.

Coil Conductors: Continuous windings with termination pads brazed or welded.

Isolate core and coil from enclosure using vibration absorbing mounts.

Enclosure: NEMA Type 1. Provide lifting eyes or brackets.

Nameplate: Include transformer connection data.

Mounting: Transformers 75 KVA and less shall be suitable for wall (min. 6" off wall), floor, or trapeze mounting; transformers larger than 75 KVA shall be suitable for floor or trapeze mounting.

B.9 Power Distribution Panelboards

Panelboards: Circuit breaker type.

The panelboard and overcurrent devices contained within shall be fully-rated.

Enclosure: NEMA Type 1 or as scheduled. Minimum cabinet size: 6.5 inches (165 mm) deep; 26 inches (660 mm) wide. Constructed of galvanized code gauge steel.

Power distribution panelboards installed in electrical rooms and mechanical rooms shall utilize a standard dead front cover. In all other areas provide cabinet front with hinged door, flush lock and hinged trim (door-in-door) to allow access to wiring gutters without removal of panel front. Hinged trim shall be held in place with screw fasteners. Finish in manufacturer's standard gray enamel.

Provide metal directory holders with clear plastic covers.

Provide panelboards with copper bus (phase buses, bus fingers, etc.), ratings as scheduled on Drawings. Provide ground bars in all panelboards. Neutral and ground bars can be dual rated ALCU9. All spaces shall have bus fully extended and drilled for the future installation of breakers.

Minimum System (i.e. individual component) Short Circuit Rating: As shown on the Drawings and as required by short circuit/coordination study.

The circuit breakers are to be totally front accessible and mounted in the panelboard to permit installation, maintenance and testing without reaching over line side bussing. The circuit breakers are to be removable by the disconnection of only the load side terminations and line and load side connections are to be individual to each circuit breaker. Common mounting brackets or electrical bus connectors are not acceptable.

Provide circuit breakers with provisions for mounting handle padlock attachments.

Breaker feeder lugs shall be dual rated for use with either aluminum or copper conductors.

Each circuit breaker is to be furnished with an externally operable mechanical means to trip the circuit breaker, enabling maintenance personnel to verify the ability of the circuit breaker trip mechanism to operate, as well as exercise the circuit breaker operating mechanisms.

A minimum of 25% future circuit breaker spaces shall be included. Spaces for future circuit breakers shall be "prepared" spaces. Provide spaces with the necessary mounting hardware and bus extensions so that when future breakers are added, only the breaker itself needs to be purchased by the installer.

Circuit breakers serving single motor loads shall be magnetic only, instantaneous trip. Overload protection shall be part of the motor combination controller.

Circuit breakers in 480V power distribution panelboards shall be fully adjustable LSI circuit breakers with electronic trip for frame sizes 400A and greater. When ground fault protection is required on the main overcurrent device, fully adjustable LSIG circuit breakers with electronic trip units shall be provided for feeder circuit breaker frame sizes 400A and greater.

Molded Case Circuit Breakers: As scheduled on the drawings, integral thermal and instantaneous magnetic trip elements in each pole.

B.10 Branch Circuit Panelboards

Lighting and Appliance Branch Circuit Panelboards: Circuit breaker type.

The panelboard and overcurrent devices contained within shall be fully-rated.

Enclosure: NEMA Type 1 or as scheduled. Minimum cabinet size: 5-3/4 inches (144 mm) deep; 20 inches (508 mm) wide with 5" minimum gutter space top and bottom. Constructed of galvanized code gauge steel. Panel enclosure (back box) shall be of non-stamped type (without KO's) to avoid concentric break out problem.

Provide cabinet front (flush or surface per plans) with concealed trim clamps, concealed hinge and flush cylinder lock all keyed alike. Front cover shall be hinged to allow access to wiring gutters without removal of panel trim. Hinged trim shall be held in place with screw fasteners. Finish in manufacturer's standard gray enamel.

Provide metal directory holders with clear plastic covers.

Provide panelboards with copper bus (phase buses, bus fingers, etc.), ratings as scheduled on Drawings. Provide ground bars in all panelboards. Phase, neutral and ground bar terminations can be dual rated ALCU9. All spaces shall have bus fully extended and drilled for the future installation of breakers.

Incoming conductors shall terminate at lug landing pads rated for the panelboard.

Provide compression type lugs to accommodate the conductor shown on drawings.

Minimum System (i.e. individual component) Short Circuit Rating: As required by short circuit/ coordination study.

Molded Case Circuit Breakers: Bolt-on type thermal magnetic trip circuit breakers. Provide UL Class A ground fault interrupter circuit breakers where shown on drawings. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits. Do not use tandem circuit breakers.

Circuit breakers shall be bolt-on type with common trip handle for all poles. No handle ties of any sort will be approved.

All of the panelboards provided under this section shall be by the same manufacturer.

All sub-feed panelboards installed side by side shall utilize same enclosure height.

B.11 Coordination Of Overcurrent Protective Devices

Provide a coordination study of the electrical system and recommend set points for all of the overcurrent and ground fault trip adjustments on the equipment provided. The coordination study and set point recommendations shall be submitted to the engineer for approval. Submittal shall be on or before date of switchboard and panelboard. equipment submittal.

B.12 Wiring Devices

B.12.1 Wall Switches

General: Heavy duty use toggle switch, rated 20 amperes and 120/277 volts AC. Switches shall be UL20 Listed and meet Federal Specification WS-896. All switches shall be heavy duty Specification Grade.

Handle: Ivory made of nylon or high impact resistant material.

B.12.2 Receptacles

NEMA Type 5-20R, ivory nylon or high impact resistant face. Receptacles shall be UL498 Listed and meet Federal Specification WC-596. All duplex receptacles shall be heavy duty Specification Grade, 20 amp rated.

Generally, all receptacles shall be duplex convenience type unless otherwise noted.

All receptacles installed in bathrooms, kitchens, and within 6 feet of the outside edge of sinks shall be GFCI type.

All receptacles installed in outdoor locations, garages, rooftops, and in other damp or wet locations shall be GFCI type with a weather-resistant (WR) rating. Unit shall have an integral ground fault current interrupter meeting the requirements of UL standard 943.

B.12.3.1 Ceiling Mounted Motion (Occupancy) Sensor

The sensor shall use passive infrared (PIR) and ultrasonic (US), for detecting room occupancy. The unit shall fit in/on a standard octagon box. All ceiling mounted sensors shall be installed to a box with ring and box support. Units shall be switch selectable for mode PIR/US/Both/Either for initial trigger and retrigger. In the Carpenter Shop, Room 202, provide a manual override and sync the dual sensors in room so all lights are energized when occupancy is detected. Locations shown on the drawing are diagrammatic, locate sensor to best utilize the units sensitivity.

Rated capacity shall be 20 amps at 120 or 277 volts, for fluorescent lamps. Line voltage sensors are acceptable, especially in exposed ceiling areas where all wiring shall be installed in conduit, including low voltage cabling if power packs are used. Provide power pack as required for low voltage sensors. Sensitivity shall be user adjustable or self-adjusting type.

The delay timer shall be adjusted within a range of 6 to 30 minutes by the contractor in the field. The sensor shall have a test mode for performance testing. Provide power packs as required

The coverage area shall be 360 degrees by approximately 30 feet radius when mounted at 9 foot height. The sensor shall have provisions, such as masking, to block out problem areas.

Test LED to indicate motion. The unit shall have a five year warranty.

B.12.3.2 Wall Mounted Motion (Occupancy) Sensor

The sensor shall use passive infrared (PIR) and ultrasonic (US), for detecting room occupancy. The unit shall fit in/on a standard octagon box. All wall mounted sensors shall be installed to a box with ring and box support. Units shall be switch selectable for mode PIR/US/Both/Either for initial trigger and retrigger. Locations shown on the drawing are diagrammatic, locate sensor to best utilize the units sensitivity. Locate unit in corners to best view persons passing through or equipment entering via the overhead door. Minimize false turn-ons due to persons walking past an open overhead door.

Rated capacity shall be 20 amps at 120 or 277 volts, for fluorescent lamps. Line voltage sensors are acceptable, especially in exposed ceiling areas where all wiring shall be installed in conduit, including low voltage cabling if power packs are used. Provide power pack as required for low voltage sensors. Sensitivity shall be user adjustable or self-adjusting type.

The delay timer shall be adjusted within a range of 6 to 30 minutes by the contractor in the field. The sensor shall have a test mode for performance testing. Provide power packs as required

The coverage area shall be 90 degrees by approximately 30 feet radius when mounted at 9 foot height. The sensor shall have provisions, such as masking, to block out problem areas.

Test LED to indicate motion. The unit shall have a five year warranty.

B.12.4 Weatherproof Cover Plate

Gasketed metal with hinged "in-use" device covers, powder coat painted. Non-metallic covers are not allowed. All receptacles installed in wet locations shall have an enclosure that is weatherproof whether or not the attachment plug is inserted.

B.12.5 Damp Location Cover Plate

Gasketed metal with hinged device covers, powder coat painted. Non-metallic covers are not allowed. All receptacles installed outdoors in a location protected from the weather or in other damp locations shall have an enclosure that is weatherproof when the receptacle is covered (attachment plug not inserted and receptacle covers closed). This type of cover plate shall be furnished in Rooms 204 through 209.

B.12.6 Photo Cells

The controller shall be rated 2000 watts tungsten at 120, 240 or 277 volts. The cell shall be cadmium sulfide, 1" diameter.

The enclosure shall be die cast zinc, gasketed for maximum weather proofing.

The enclosure shall include the positioning lug on the top of the enclosure.

The unit shall have a delay of up to two minutes to prevent false switching. ON/Off adjustment shall be done by moving a light selector with a range from 2 to 50 foot-candles.

Mounting shall be for a 1/2" conduit nipple.

The unit shall have a 5 year manufacturer warranty.

The contacts shall be SPST normally closed.

The operational temperature range shall be -40 to 140 degrees F (-40 to +60 degrees C).

B.13 Interior LED Luminaires

One example luminaire matching what is proposed for use on the project. Example luminaire shall be available for evaluation for up to two weeks time. Furnish the following list of specific documentation detailing the characteristics of the LED luminaire:

- Fixture IES files (.ies format) for illumination modeling
- Cut sheets, warranty information and parts list for all equipment.
- Luminaire heat dissipation techniques.
- Energy usage information.
- Color spectrum with HID lamp comparison.
- Optical design features.

Do not order materials until the engineer approves the list.

B.13.1 Electronic Components

Luminaire shall accommodate varied lighting output from high brightness, 4300K (+/- 500K per full unit), minimum 70 CRI or better, long life LED sources. Drivers shall operate across 120-277V, 50/60 Hertz as standard. LED drivers shall have a power factor greater than 90%.

B.13.2 Optical / Illumination Performance

Luminaire shall conform to the following:

- Luminaire tested and certified by an independent test laboratory to meet the photometric performance criteria established by IESNA LM-79.

B.13.3 Manufacturer and Model Numbers

See the fixture schedule on the Plans.

B.14 Disconnect Switches

Fusible Switch Assemblies (use only when overcurrent protection is required): NEMA Type Heavy Duty; quick-make, quick-break, load interrupter, enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse Clips: designed to accommodate Class R, Class J or Class CC (motors) cartridge type fuses.

Nonfusible Switch Assemblies: NEMA Type Heavy Duty; quick-make, quick-break, load interrupter, enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.

Enclosure:

- Indoor: NEMA 1 code gauge steel with rust inhibiting primer and baked enamel finish
- Outdoors: NEMA 3R code gauge zinc coated steel with baked enamel finish or NEMA 4 when indicated on drawings.
- Corrosive Areas, Brine Room and Damp/Wet locations: NEMA Type 4X, 304 stainless steel with brushed finish.

Provide manufacturer's equipment ground kit in all disconnect switches.

In applications where the switch serves as the service entrance disconnect, provide service ground kit, label as service disconnect and provide UL listing for service disconnect.

Fuses 600 Amperes and Less: Dual element, time delay, 250V or 600 volt as required, UL Class RK 1. Interrupting Rating: 200,000 rms amperes.

B.15 Surge Protective Devices

The SPD shall be listed in accordance to UL 1449, Third Edition. The product and ratings shall be included in the database of the UL.com web site. Provide an SPD for the following panels: MDP, PP-1, LP-A, LP-B, LP-C, LP-D, LP-E.

The surge protective device (SPD) shall be designated a location Type 1 or Type 2 device intended for installation on the load side of the service equipment overcurrent device, including SPDs located at the branch panel.

The SPD shall be connected in parallel with the facility's electrical system.

The SPD shall be made up of metal oxide varistors (MOV's), or a combination of MOV's with selenium cells or silicon avalanche diodes, ensuring that all of the performance requirements are met. Gas tubes shall not be used.

The entire SPD shall be enclosed in a metal or ABS enclosure, NEMA rated for the location. SPDs at main service equipment shall be mounted outside the switchboard or panelboard (not integral to, or installed within the switchboard or panelboard). SPDs for branch panelboard (2nd tier) locations may be mounted outside of, or integral to, the branch panelboard.

The SPD shall have a maximum continuous operating voltage (MCOV) rating not less than 115% of nominal voltage of the system it is protecting.

Protection Modes:

The SPD shall have line to neutral (L-N), line to ground (L-G), line to line (L-L) and neutral to ground (N-G) protection modes for grounded wye configured systems. For a delta configured system, the device shall have line to line (L-L) and line to ground (L-G) protection modes.

Voltage Protection Rating (VPR):

The UL 1449 Voltage Protection Rating (VPR) for the device shall not exceed the following:

208Y/120 volt applications:	900V L-N, L-G, N-G; 1200V L-L
480Y/277 volt applications:	1200V L-N, L-G, N-G; 2000V L-L
480 volt delta applications:	1800V L-G, 2000V L-L

Nominal Discharge Current (In):

The SPD shall have a UL 1449 Nominal Discharge Current Rating (In) of not less than 20kA.

Short Circuit Current Rating (SCCR):

The SPD shall have a UL 1449 Short Circuit Current Rating (SCCR) of not less than 200kA.

Surge Current Rating:

The single-pulse (8 X 20 microsecond waveform as specified in ANSI/IEEE Standard C62.41) surge current capacity shall not be less than the following:

100 kA per mode for service entrance, switchboard, and main distribution panel locations
50 kA per mode for branch panelboard (2nd tier) locations

Electrical Noise Filtering:

The SPD shall contain a high performance EMI/RFI noise rejection filter.

Each SPD shall include externally-mounted LED visual status indicators that indicate the on-line status of the unit, for each phase.

Each SPD shall be provided with audible diagnostic monitoring by way of audible alarm with on/off silence function.

Each SPD shall be provided with one set of NO/NC dry contacts for alarm conditions.

The surge protective device is only required at the Main Distribution Panel in the Electrical Room at the Salt Brine Building.

B.16 Variable Frequency Drive (VFD)

Provide a variable frequency drive (VFD) as part of SPV.0105.1027 COMMON ELECTRICAL WORK SALT BRINE BUILDING. Unit shall be used to power the salt conveyor. The conveyor is not part of these bid items. Unit shall be a constant torque, pulse width modulated Allen Bradley Model 753, Square D or equal.

B.16.1 Submittals

Submit the following shop drawings:

1. Panel fabrication and dimensions drawings.
2. Front of panel layout drawings.
3. Interior panel layout drawings.
4. Nameplate legend.
5. Component specification sheets.
6. Instruction manuals.
7. Parts list.
8. Recommended spare parts list.
9. Include engineer's tag number or description when available on each drawing, specification sheet, and manufacturer's catalog cut in submittal for each component included in system.
10. Include full load amperes (FLA) of each load the respective VFD is servicing. Base the FLA data upon equipment to be submitted.

Submit the following operation and maintenance (O&M) data:

1. Submit manufacturer's standard O&M data indicating safety and periodic maintenance data.

B.16.2 VFD Characteristics

Unit's operating range shall be from -10-degrees C to +50 degrees C, humidity 5 to 95% noncondensing, cUL/UL approved or CSA certified and UL listed.

Input power will be 460 vac (+8%, -10%), 3-phase, 3-wire, any phase sequence, 60 Hz (+/-5%), Unit shall be capable of withstanding line voltage transients up to 3000 v in accordance to ANSI 37.90.1. Drive shall be constructed to limit line noise generated due to voltage distortion and line notch. Include as required to meet IEEE 519:

Output power shall be 3-phase, 3-wire, sinusoidal wave, pulse width modulated wave form, maximum output: 480 vac, 6 to 60 Hz, adjustable, frequency accuracy: +/- 1% of setting. Rate full load output current in excess of motor nameplate current and increase of motor current due to harmonics. Provide output open and short circuit protection. Power transistors shall be Insulated Gate Bipolar Transistors (IGBT's) with PIV ratings of 1200 v minimum.

Unit shall be rated for a heavy duty 40 Hp and have a 65 full load amp rating. Unit shall be capable of starting and accelerating to full speed a fully loaded salt conveyor. Coordinate with the salt dome manufacturer who will be responsible for furnishing the salt conveyor. Acceleration time shall be in accordance to the salt conveyor motor manufacturer recommendations.

Motor performance when driven by the VFD shall be 0.5% speed regulation in manual or automatic speed control mode, 150% starting torque, 100% rated torque from 60 Hz to specified turndown over 10:1 speed range.

Minimum Efficiency for constant torque applications:

- a. 100% rated speed and load – 95% or better.
- b. 70% rated speed and 100% load – 94% or better.
- c. 50% rated speed and 100% load – 93% or better.
- d. 30% rated speed and 100% load – 91% or better.
- e. 20% rated speed and 100% load – 87% or better.

Provide short circuit and drive input protection with instantaneous over-current trip shutdown set at 180%, under-voltage protection with automatic restart, input power circuit breaker with 65,000 AIC capacity, labeled in accordance to UL Standard 489 with through the door operator, 150% overload capacity for 60 seconds. Have the following features, provisions to lock in "OFF" position, mechanical interlock to prevent opening cabinet door with disconnect in the "ON" position, or moving disconnect to the "ON" position with the door open, auxiliary contact on main disconnect to isolate control power when control power fed from an external source, barriers and warning signs on terminals that are energized with power disconnect "OFF".

Provide the following internal protective features including output phase sequence independent of input phase sequence, phase loss protection, high or low sustained voltage shutdown, 120 vac or 24 Vdc grounded control circuits, anti-regenerative circuit to protect inverter during deceleration, transistor over-current and over-temperature protection, electrically isolated low voltage logic, DC bus fuse protection, MOV (metal oxide varistor) surge protection.

Unit shall have the following inverter adjustments, maximum Speed: 50 to 100% rated, minimum Speed: 6 to 70% rated, current limit: 10% to 150%, linear Acceleration: 3 to 300 seconds, linear Deceleration: 3 to 300 seconds, torque boost, maximum voltage level, electronic thermal overload: 10 to 100% of drive current, carrier frequency: 2.2 to 8.0 kHz adjustable, up to three adjustable skip frequencies. Provide selectable volts/Hz patterns to include general purpose, variable torque, constant torque, constant horsepower, and programmable. Provide fault recovery with auto restart and auto restart from loss of power.

Provide inverter diagnostic and shutdown features for external fault, low line voltage, high line voltage, instantaneous current overload, internal over-temperature, over-current stall, over-voltage stall, ground fault, blown input fuse and control power supply failure.

Inverter construction shall have modular construction for ease of maintenance, easily accessible from front and boards constructed of fire retardant materials in accordance to NEMA Grade FR4 specifications.

The unit shall be capable of utilizing the following controls - two-wire or three-wire start/stop control contacts in the automatic mode, an emergency stop without a deceleration delay via an unpowered contact, accept 4-20 mAdc input speed reference with adjustable bias and gain, accept 0-10k potentiometer input speed reference, provide dry contact for remote indication of drive run status, provide dry contact for remote indication of common equipment fail alarm, provide isolated 4-20 mAdc powered signal for remote indication of drive speed, provide ethernet connection for monitoring drive performance parameters. Drive shall be addressable by the respective future PLC.

Provide front of panel multifunction display/keypad, capable of controlling drive and setting drive parameters. Provide as a minimum with the following functions:

- a. Start
- b. Stop
- c. Reset
- d. Increase/Decrease Speed Control
- e. Manual or Remote Mode

The remote STOP pushbutton shall always stop the conveyor with the prescribed deceleration. The remote EMERGENCY STOP pushbutton shall always immediately stop the conveyor (without deceleration time).

Display shall indicate following parameters:

- Control mode – manual or automatic.
- Output frequency.
- Output voltage.
- Output current.
- Motor RPM.
- Alarms and Faults

Keypad functions shall include:

- a. Menu driven.

Parameters stored in non-volatile memory, password or code protected

Provide an engraved warning nameplate attached to the front of the VFD. Nameplate shall have red background with white 0.5-inch lettering. Nameplate to read:

WARNING
DO NOT RUN SALT CONVEYOR FROM THE
MANUAL START/STOP FUNCTIONS
ON THIS DRIVE. USE THE CONTROLS
LOCATED AT THE CONVEYOR.
DRIVE TO REMAIN IN THE AUTO MODE.

C Construction

C.1 Coordination

Should it be necessary to raise or lower or move longitudinally any part of the electrical work to better fit the general installation, such work shall be done at no extra cost, provided such decision is reached prior to actual installation. Check location of electrical outlets with respect to other installations before installing.

Verify that all devices are compatible for the surfaces on which they will be used. This includes, but is not limited to light fixtures, panelboards, devices, etc. and recessed or semi-recessed heating units installed in/on architectural surfaces.

Any installed work that is not coordinated and that interferes with other contractor's work shall be removed or relocated at the installing contractor's expense.

C.2 Housekeeping And Clean Up

Clean up and remove from the premises, on a daily basis, all debris and rubbish resulting from its work and shall repair all damage to new and existing equipment resulting from its work. When job is complete, this contractor shall remove all tools, excess material and equipment, etc., from the site.

C.3 General Wiring Methods

Splice only in junction or outlet boxes. No conductor less than 10 AWG shall be installed in exterior underground conduit. Identify ALL low voltage wire, 600V and lower. Neatly

train and lace wiring inside boxes, equipment, and panelboards. Make conductor lengths for parallel conductors equal.

C.4 Wiring Installation In Raceways

Pull all conductors into a raceway at the same time. Use Listed water or silicone based wire pulling lubricant for pulling 4 AWG and larger wires and for other conditions when necessary. Wax based lubricants are not allowed. Pulling lubricant is not required for low friction type products where the cable manufacturer recommends that cables be pulled without lube.

Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.

Completely and thoroughly swab raceway system before installing conductors.

Place all conductors of a given circuit (this includes phase wires, neutral (if any), and ground conductor) in the same raceway. If parallel phase and/or neutral wires are used, then place an equal number of phase and neutral conductors in same raceway or cable.

C.5 Wiring Connections and Terminations

Splice only in accessible junction boxes. Wire splices and taps shall be made firm, and adequate to carry the full current rating of the respective wire without soldering and without perceptible temperature rise.

All splices shall be so made that they have an electrical resistance not in excess of 2 feet (600 mm) of the conductor. Use solderless twist type spring connectors (wire nuts) with insulating covers for wire splices and taps, 10 AWG and smaller.

Use mechanical or compression connectors for wire splices and taps, 8 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of the wiring.

Thoroughly clean wires before installing lugs and connectors.

At all splices and terminations, leave tails long enough to allow cutting splice out and completely re-splice.

Solid colored insulation is required for all THHN/THWN-2 wire. For other wire types use colored wire or identify wire with colored tape at all terminals, splices and boxes. Wire shall be colored as indicated below.

In existing facilities, use existing color scheme.

In new facilities, use black and red for single phase circuits at 120/240 volts, use Phase A black, Phase B red and Phase C blue for circuits at 120/208 volts single or three phase, and use Phase A brown, Phase B orange and Phase C yellow for circuits at 277/480 volts single or three phase.

Note: This includes fixture whips except for listed whips mounted by the fixture manufacturer on the fixture and listed as a system.

All switch legs shall be the same color as their associated circuit. Traveler conductors run between 3 and 4 way switches shall be colored pink or purple.

C.6 Wire Color

Neutral Conductors: White for 120/208V and 120/240V systems, Gray for 277/480V systems. Where there are two or more neutrals in one conduit, each shall be individually identified with a different stripe.

Branch Circuit Conductors: Three or four wire home runs shall have each phase uniquely color coded.

Feeder Circuit Conductors: Each phase shall be uniquely color coded. Single conductors shall be color-coded as follows:

SYSTEM	CONDUCTOR	COLOR
3-phase or 1-phase 208Y/120-Volt or 120/240-Volt	Phase A	Black
	Phase B	Red
	Phase C	Blue
	Neutral	White
3-phase, 480-Volt or 480 Y/277 Volt	Phase A	Brown
	Phase B	Orange
	Phase C	Yellow
All Systems	Neutral	Gray
	Ground	Green

Ground Conductors: Green colored insulation for THHN/THWN-2 wire. For other wire types use green colored wire or identify wire with green tape at both ends and at all access points, such as panelboards, motor starters, disconnects and junction boxes. When isolated grounds are required, contractor shall provide green with yellow tracer.

C.7 Grounding

Provide code sized copper grounding electrode conductor from secondary switchboard ground bus, each separately derived system neutral, secondary service system neutral to street side of water meter, building steel, ground rod, and any concrete encased electrodes. Provide bonding jumper around water meter.

Equipment Grounding Conductor: Provide separate, insulated equipment grounding conductor within each raceway. Terminate each end on suitable lug, bus, enclosure or bushing. Provide a ground wire from each device to the respective enclosure.

Bond together system neutrals, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, and plumbing systems.

Install ground grid under access floors where indicated. Construct grid of #4 AWG bare copper wire installed on 72 inch centers both ways. Bond each access floor support pedestal to grid.

Bond together each metallic raceway, pipe, duct and other metal object entering space under access floors. Bond to under floor ground grid. Use #4 AWG bare copper conductor.

Grounding resistance 5 ohms maximum. Test to be witnessed by the engineer. Provide five working days written advance notice of test.

C.8 Hangers and Supports

Fasten hanger rods, conduit clamps, outlet, junction and pull boxes to building structure using pre-cast insert system, preset inserts, beam clamps, expansion anchors, or spring steel clips (interior metal stud walls only).

Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchors on concrete surfaces; sheet metal screws in sheet metal studs and wood screws in wood construction. If nail-in anchors are used, they must be removable type anchors.

Powder-actuated fasteners and plastic wall anchors are not permitted. Compressed-air power-actuated fasteners may ONLY be used for the installation of separate ceiling wires required for support of conduits and aircraft cable hung light fixtures.

File and de-bur cut ends of support channel and spray paint with cold galvanized paint to prevent rusting.

Do not fasten supports to piping, ductwork, mechanical equipment, cable tray or conduit. Do not fasten to suspended ceiling grid system.

Do not drill structural steel members unless approved by the engineer.

Fabricate supports from galvanized structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.

In wet locations, mechanical rooms and electrical rooms install free-standing electrical equipment on 3.5-inch (89 mm) concrete pads.

Install surface-mounted cabinets and panelboards with a minimum of four anchors. At all cabinet and panelboard locations on concrete or concrete block walls, and at all locations below grade, provide steel channel supports to stand cabinet one inch (25 mm) off wall (7/8" Uni-strut or 3/4" painted, fire-retardant plywood is acceptable). In above-grade equipment rooms that have drywall walls, the cabinets and panelboards may be mounted to the drywall if backing is provided in the stud walls behind the equipment.

Bridge studs top and bottom with channels to support flush-mounted cabinets and panelboards in stud walls.

Furnish and install all supports as required to fasten all electrical components required for the project, including free standing supports required for those items remotely mounted from the building structure,

C.9 Conduit Sizing, Arrangement, And Support

EMT is permitted to be used in sizes 4" (50 mm) and smaller for power and low-voltage systems. See Conduit Installation Schedule below for other limitations for EMT and other types of conduit.

Size power conductor raceways for conductor type installed. Conduit size shall be 3/4 inch.

Caution: Per the NEC, the allowable conductor ampacity is reduced when more than three current-carrying conductors are installed in a raceway. Contractor must take the NEC ampacity adjustment factors into account when sizing the raceway and wiring system.

Arrange conduit to maintain headroom and present a neat appearance.

Route exposed conduit and conduit above accessible ceilings parallel and perpendicular to walls and adjacent piping.

Maintain minimum 6 inch (150 mm) clearance between conduit and piping. Maintain 12 inch (300 mm) clearance between conduit and heat sources such as flues, steam pipes, and heating appliances.

Arrange conduit supports to prevent distortion of alignment by wire pulling operations. Fasten conduit using galvanized pipe straps, conduit racks (lay-in adjustable hangers), clevis hangers, or bolted split stamped galvanized hangers.

Group conduit in parallel runs where practical and use conduit rack (lay-in adjustable hangers) constructed of steel channel with conduit straps or clamps. Provide space for 25 percent additional conduit.

Do not fasten conduit with wire or perforated pipe straps. Before conductors are pulled, remove all wire used for temporary conduit support during construction.

Support and fasten metal conduit at a maximum of 8 feet (2.4 m) on center.

Supports shall be independent of the installations of other trades, e.g. ceiling support wires, HVAC pipes, other conduits, etc., unless so approved or detailed.

In general, all conduit shall be concealed except where noted on the drawings or approved by the architect/engineer. Verify with engineer all surface conduit installations except in mechanical rooms.

Changes in direction shall be made with symmetrical bends, cast steel boxes, stamped metal boxes or cast steel conduit bodies.

For indoor conduits, no continuous conduit run shall exceed 100 feet without a junction box.

All conduits installed in exposed areas shall be installed with a box offset before entering box.

C.10 Conduit Installation

Cut conduit square; de-burr cut ends.

Conduit shall not be fastened to the corrugated metal roof deck.

Bring conduit to the shoulder of fittings and couplings and fasten securely.

Use conduit hubs for fastening conduit to cast boxes. Use sealing locknuts or conduit hubs for fastening conduit to sheet metal boxes in damp or wet locations.

Terminate all conduit (except for terminations into conduit bodies) using conduit hubs, or connectors with one locknut, or shall use double locknuts (one each side of box wall) and insulated bushing. Provide bushings for the ends of all conduit not terminated in box walls.

Install no more than the equivalent of:

- Three 90 degree bends between boxes for electrical systems.
- Two 90 degree bends between boxes for communications and other low voltage systems.

Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 2 inch (50 mm) size unless sweep elbows are required.

Bend conduit according to manufacturer's recommendations. Torches or open flame shall not be used to aid in bend of PVC conduit.

Use suitable conduit caps or other approved seals to protect installed conduit against entrance of dirt and moisture.

Provide 1/8 inch (3 mm) nylon pull string in empty conduit, except sleeves and nipples.

Install expansion-deflection joints where conduit crosses building expansion joints. Note: expansion-deflection joints are not required where conduit crosses building control joints if the control joint does not act as an expansion joint. Install expansion fitting in PVC conduit runs as recommended by the manufacturer.

Avoid moisture traps where possible. Where moisture traps are unavoidable, provide junction boxes with drain fittings at conduit low points.

Where conduit passes between areas of differing temperatures such as into or out of cool rooms, freezers, unheated and heated spaces, buildings, etc., provide Listed conduit seals to prevent the passage of moisture and water vapor through the conduit. Rooms 200, 201, 202 and the Salt Brine Building are heated. All other areas are not heated.

Route conduit through roof openings for piping and ductwork where possible.

Conduit is not permitted in any slab topping of 2 inches (50 mm) or less.

PVC conduit shall transition to galvanized rigid metal conduit before it enters a foundation, wall (where exposed) or up through a concrete floor.

All conduit installed underground (exterior to building) shall be buried a minimum of 24" below finished grade, whether or not the conduit is concrete encased.

Clean PVC conduit with solvent, and dry before application of glue. The temperature rating of glue/cement shall match weather condition. Apply full even coat of cement/glue to entire area that will be inserted into fitting. The entire installation shall meet manufacturer's recommendations.

C.11 Conduit Installation Schedule

Conduit other than that specified below for specific applications shall not be used.

- Underground Installations Within 5 Feet (1.5 m) of Foundation Wall: Rigid metal conduit.
- Underground Installations More than 5 Feet (1.5 m) From Foundation Wall: Schedule 40 PVC conduit.
- Under Slab on Grade Installations: Schedule 40 PVC conduit.
- Exposed Outdoor Locations: Rigid metal conduit.

- Concealed in Concrete Walls: Schedule 40 PVC conduit.
- Concealed in Block Walls: Schedule 40 PVC conduit.
- Within Concrete Slab: Schedule 40 PVC conduit.
- Wet Interior Locations: Schedule 40 PVC conduit
- Concealed Dry Interior Locations: Electrical metallic tubing.
- Exposed Dry Interior Locations: Intermediate metal conduit.
- Motor and equipment connections: Liquidtight flexible metal conduit (LFMC) (all locations). Minimum length shall be one foot (300 mm), maximum length shall be three feet (900 mm). Conduit must be installed perpendicular to direction of equipment vibration to allow conduit to freely flex.

C.12 Pull And Junction Box Installation

Pull boxes and junction boxes shall be minimum 4 inch square (100 mm) by 2 1/8 inches (54 mm) deep for use with 1 inch (25 mm) conduit and smaller. On conduit systems using 1 1/4 inch (31.75 mm) conduit, minimum junction box size shall be 4 11/16" by 2-1/8" deep.

Where used with raceway(s) of larger than 1 1/4" trade size or larger, pull box shall be sized as follows unless otherwise noted on the drawings:

- For straight pull through, have a length of at least 8-times trade-size diameter of largest raceway;
- For angle and U pulls:
 1. Have a distance between each raceway entry inside box and opposite wall of box of at least 6-times trade-size diameter of largest raceway, this distance being increased by sum of trade-size diameters of other raceways on same wall of box; and
 2. Have a distance between nearest edges of each raceway entry enclosing same conductor of at least six times trade-size diameter of raceway; or six times trade-size diameter of larger raceway if they are of different sizes.
- For a raceway entering wall of a pull box opposite to a removable cover, have a distance from wall to cover of not less than trade-size diameter of largest raceway plus 6-times diameter of largest conductor.

All boxes are to be readily-accessible. Support pull and junction boxes independent of conduit.

C.13 Identification

Where mixed voltages are used in one building (e.g. 4160 volt, 480 volt, 208 volt) each switch, switchboard, junction box, equipment, etc., on each system shall be labeled for voltage in addition to other requirements listed herein.

All branch circuit and power panels shall be identified with the same symbol used in circuit directory in main distribution center.

Clean all surfaces before attaching labels with the label manufacturer's recommended cleaning agent. Install all labels firmly as recommended by the label manufacturer. Labels shall be installed plumb and neatly on all equipment.

Install nameplates parallel to equipment lines.

Secure nameplates to equipment fronts using screws, rivets or manufacturer approved adhesive or cement.

Embossed tape will not be permitted for any application.

Provide a sign at the service-entrance equipment indicating type and location of on-site emergency power sources and on-site legally required standby power sources, per NEC 700.8 and NEC 701.9.

Provide a sign at each service disconnect indicating "Service Disconnect", and locate above the main switch or circuit breaker, per NEC 230.70(B).

Provide nameplates of minimum letter height as scheduled below:

- Distribution Panelboards, Branch Panelboards, Switchboards and Motor Control Centers: 1 inch (25 mm); identify equipment designation. 1/2 inch (13 mm); identify voltage rating, source and room location of the source. Panelboards serving NEC 700, 701 or 702 loads shall identify which branch they serve.
- Circuit Breakers, Switches, and Motor Starters in Distribution Panelboards, Switchboards and Motor Control Centers: 1/2 inch (13 mm); identify circuit and load served, including location.
- Individual Circuit Breakers, Disconnect Switches, Enclosed Switches, and Motor Starters: 1/2 inch (13 mm); identify source and load served.
- Transformers: 1 inch (25 mm); identify equipment designation. 1/2 inch (13 mm); identify primary and secondary voltages, primary source and location, and secondary load and location.

Typed directories for panels must be covered with clear plastic, and have a metal frame. Room number on directories shall be Owner's numbers, not Plan numbers unless Owner so specifies.

Provide wire labels on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits, and with wire number as indicated on schematic and interconnection diagrams or equipment manufacturer's shop drawings for control and signal wiring.

All wiring shall be labeled within 2 to 4 inches of terminations. Each end of a wire or cable shall be labeled as soon as it is terminated including wiring used for temporary purposes.

C.14 INSTALLATION Of Dry Type Transformers

Set transformer plumb and level. All transformers mounted to floor shall be installed on a 3-1/2" concrete pad.

Use flexible conduit, 2 ft. (0.6 m) minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure. Conduit entry can be in the bottom of the transformer in locations where PVC conduit is used in slab on grade, - provide a PVC connector and bushing, or bell ends, on each conduit entry. Coordinate conduit installation with submittals and shop drawings for the transformer.

Mount transformers on vibration isolating pads installed between the floor and the transformer, suitable for isolating the transformer noise from the building structure.

Provide sufficient space around transformer for cooling as recommended by the manufacturer. Provide a minimum space of 12" between the transformer and any wall.

C.15 Panelboard Installation

Install panelboards plumb with wall finishes.

Height: 6 feet (2 m) to top.

Install a crimp type stud termination to stranded conductor when terminating on circuit breakers without a captive assembly rated for terminating stranded conductors.

Provide filler plates for unused spaces in panelboards.

Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.

Stub three (3) empty 3/4" conduits to accessible location above ceiling or below floor out of each recessed panelboard. Cap these conduits to prevent material from entering them.

C.16 Installation of Wiring Devices

See plans for device mounting heights.

Install wall switches with OFF position down.

Wall dimmers: de-rate ganged dimmers as instructed by manufacturer; do not use common neutral.

Install convenience receptacles with grounding pole on bottom.

Install box for information outlet at the same height as adjacent convenience receptacles. Locate boxes for information outlet as close as practical to duplex power outlet, approximately 2-inches apart.

Install specific-use receptacles at heights shown on Contract Drawings.

Install decorative plates on switch, receptacle, and blank outlets in finished areas.

Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface-mounted outlets.

Install devices and wall plates flush and level.

Receptacles shall have a bonding conductor from grounding terminal to the metal conduit system. Self-grounding receptacles using mounting screws as bonding means are not approved.

Inspect each wiring device for defects.

Operate each wall switch and sensor with circuit energized, and verify proper operation.

Verify that each receptacle device is energized.

Test each receptacle device for proper polarity.

Test each GFCI receptacle device for proper operation.

The department reserves the right to be present at all tests

C.17 Occupancy Sensors

Install occupancy sensors at locations indicated on the manufacturer's submittal layout drawings. Sensors shall be located to prevent false "ON" tripping of the lights. Sensors in rooms with overhead doors shall function when the doors are open and not provide false occupancy when personnel walk by further than 5'-0" from open door.

Sensitivity Test: After the sensor has been energized for at least 15 minutes, walk to the middle of the room. Make no motion for 20 seconds. Move one arm up and down slowly. The test LED should blink.

Time Delay Test: Set the time delay for 10 minutes. Walk into the room to activate the sensor then leave room. Sensor must turn lights off at approximately 10 minutes. Walk into the room again to reactivate the lights. Lights should activate within 1 second.

C.18 Disconnect Switch Installation

Install disconnect switches where indicated on Drawings or required by NEC.

Provide identification via engraved 2-layer nameplate.

Provide label on inside of disconnect cover identifying the type and size of fuse to be utilized.

C.19 Variable Frequency Drive

Supplier's or manufacturer's representative for equipment specified herein shall be present at job site or classroom designated by OWNER for minimum mandays indicated, travel time excluded, to supervise final adjustment of system after installation is complete, system startup, and training of OWNER'S personnel for system operation. Include minimum of:

- a. 1 man-days for Installation Services.
- b. 0.5 man-days for Instructional Services.
- c. 0.5 man-days for Post Startup Services

Instructional services and post startup services will be on the same day.

D Measurement

The department will measure Common Electrical Work Storage Building 1, Common Electrical Work Storage Building 2, and Common Electrical Work Salt Brine Building as separate lump sum units of work for each individual building, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.1025	Common Electrical Work Storage Building 1	LS
SPV.0105.1026	Common Electrical Work Storage Building 2	LS
SPV.0105.1027	Common Electrical Work Salt Brine Building	LS

Payment is full compensation furnishing and installing all raceway and wiring, electrical distribution equipment, lighting and lighting controls, receptacles, junction boxes and all electrical work within the limits of each respective building.

96. Insulation Board Polystyrene, 4-Inch, Item SPV.0180.0001.

A Description

This special provision describes furnishing and installing polystyrene insulation board, cover material, granular backfill and compaction in accordance to the plans, standard specification for Sewer and Water Construction in Wisconsin, latest edition and amendments, (“SWS”) and as hereinafter provided.

B Materials

B.1 General

Provide polystyrene insulation board that conforms to the requirements for Extruded Insulation Board, AASHTO Designation M230, except as hereinafter revised.

Delete flammability requirement.

All materials will require inspection by Milwaukee Metropolitan Sewer District (MMSD). Notify Larry Anderson, office: (414) 225-2241 or cell: (414) 617-1429 for materials inspection and construction inspection, three working days prior to starting construction.

Pipe cover material shall conform to the requirements contained in the “SWS”. Granular backfill material shall conform to section 8.43.4 under roadways and drives in the “SWS”.

B.2 Certification

Before installation, obtain from the manufacturer a certification indicating compliance and furnish it to the engineer.

C Construction

C.1 General

Repair existing polyethylene encasement observed to be compromised or damaged during construction around an exposed force main pipe per requirements of the “SWS”. Avoid damage to the polyethylene encasement.

C.2 Insulation Board

Place insulation board on top and sides of the force main cover material, 6 inches above the top of pipe and 6-inches adjacent to the sides of the pipe. Place boards on the top with the long side parallel to the centerline of the pipe, and a minimum width of outside diameter of the force main plus 24 inches. Place the boards in a staggered arrangement to eliminate continuous traverse joints.

Store insulation board in an area where it will not be damaged. Ensure insulation board is free from dents, cracks, holes, and other defects that compromise its integrity. Ensure insulation board is not damaged during installation.

C.3 Compaction

Compact granular backfill mechanically to a minimum of 95% maximum density as determined by ASTM D1557, Method D (Modified Proctor Test) from the top of the pipe cover material to the surface of the trench. Special compaction equipment and measures are required where standard compaction equipment cannot be utilized. Flooding of backfill will not be allowed. Compact native backfill mechanically to a minimum of 90% maximum density as determined by ASTM D1557 (Modified Proctor Test) from top of pipe cover material to trench surface. Compaction of the excavated and granular backfill material shall be compacted to achieve uniform consolidation in conformance with section 2.6.14(b) of the “SWS”.

D Measurement

The department will measure Insulation Board Polystyrene (4-inch) by the square yard, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.0001	Insulation Board Polystyrene 4-Inch	SY

Payment is full compensation for furnishing and installing all materials, including insulation board, cover material, and granular backfill material; for furnishing all excavation, dewatering, sheathing and shoring; for repairing compromised or damaged polyethylene encasement, for backfilling, mechanical compaction, for removing sheathing and shoring; for disposal of all surplus or waste material; and for site cleanup.

97. Topsoil Special, Item SPV.0180.0007.

A Description

This special provision section describes furnishing, placing, spreading, and finishing humus-bearing soil, adapted to sustain plant life, commonly known as topsoil, from locations the contractor furnishes beyond the limits of the right-of-way.

This special provision also describes removing topsoil from the sites of proposed roadway excavations and embankments in amounts and depths available and necessary to cover the work slopes. This work also includes reclamation, placing, spreading, and finishing of this topsoil.

B Materials

Furnish material that is relatively free from large roots, sticks, weeds, brush, stones, litter, and waste products.

Furnish material, either obtained offsite, or material obtained within project limits, consisting of loam, sandy loam, silt loam, silty clay loam, or clay loam humus-bearing soils adapted to sustain plant life. Do not use surface soils from ditch bottoms, drained

ponds, and eroded areas, or soils which are supporting growth of NR 40 listed plants and noxious weeds or other undesirable vegetation. Ensure that the material conforms to the following:

Topsoil Requirements	Minimum Range	Maximum Range
Material Passing 2.00 mm (#10) Sieve*	90%	100%
PH Range	6.0	7.0
Organic Matter**	5%	20%
Clay	5%	30%
Silt	10%	70%
Sand and Gravel	10%	70%

*See standard spec 625.3.3 for sieve requirements when using either sod or seed mixture 40.

**Organic matter determined by loss on ignition test of samples oven dried to constant weight at 212 F (100 C).

C Construction

C.1 Preparing the Roadway for Topsoil

Undercut or underfill all areas designated to receive topsoil to a degree that if covered to the required depth with topsoil the finished work conforms to the required lines, grades, slopes and cross sections the plans and drawings show.

C.2 Processing Topsoil

Mow topsoil procurement areas to a height of approximately 6 inches. Remove litter such as brush, rock, and other materials that will interfere with subsequent vegetation establishment.

Strip off the humus-bearing soil. Take care to minimize removing the underlying sterile soil. Then stockpile the topsoil on the right-of-way or place it directly on the designated areas.

Obtain topsoil from embankment areas outside the roadway foundation only if that additional material is required to cover the slopes, and conforms to the requirements of section B above. Utilize excess topsoil on the project or dispose of as specified in standard spec 205.3.12.

C.3 Placing Topsoil

After preparing and finishing the areas designated for topsoil to the required lines, grades, slopes and cross section, place and spread the topsoil to a uniform depth as the plans show or the contract requires. If no depth is shown, place and spread the topsoil to a minimum depth of 4 inches in rural areas and a minimum depth of 6 inches in urban areas, or as the engineer designates.

Break down all clods and lumps using appropriate equipment to provide a uniformly textured soil.

Where using either sod or seed mixture 40 ensure that, for the upper 2 inches, 100 percent of the material passes a one-inch sieve and at least 90 percent passes the No. 10 sieve.

Remove rocks, twigs, foreign material, and clods that cannot be broken down. Dress the entire surface to present a uniform appearance. The engineer will not require rolling.

If light sandy soils are covered with heavier clay bearing loam topsoil, then mix or blend the 2 types of soils to a more or less homogeneous mixture by using the appropriate equipment.

D Measurement

The department will measure Topsoil Special, acceptably completed by the square yard. The measured quantity shall equal the actual number of square yards of topsoiled area to the depth specified within the limits of construction designated on the plans, or in the contract, or as the engineer directs.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.0007	Topsoil Special	SY

Payment for Topsoil Special is full compensation for removing, stockpiling, reclaiming, providing, processing, excavating, loading, hauling, and placing this material; and for undercutting excavations, or underfilling embankments necessary to receive this material. The department will make no allowance, adjustment, or measurement for payment under the Excavation bid items for undercutting cut sections, underfilling embankments, or deductions for materials obtained from areas of cut sections.

If an area is damaged by erosion after partial acceptance, the department will pay for restoring topsoil in these areas at a unit price determined by multiplying the contract unit price bid for Topsoil multiplied by 3, the department will pay for restoration under the Restoration Post Acceptance Topsoil administrative item.

The department will not pay for removing topsoil from outside the roadway foundation in embankment areas unless that material is necessary to cover the slopes.
SEF Rev.13_0626

98. Management of Solid Waste, Item SPV.0195.0001.

A General

A.1 Description

This work will conform with the requirements of standard spec 205; to pertinent parts of the Wisconsin Administrative Code, Chapters NR 700-736 Environmental Investigation and Remediation of Environmental Contamination; Wisconsin Administration Code,

Chapters NR 500-538, Solid Waste; and as shown on the plans and as supplemented herein.

Contaminated soil classified as solid waste will be encountered within the construction limits. Impacted waste material excavated during construction which cannot in the opinion of the environmental consultant be managed as common excavation or as petroleum-contaminated soil will be managed as solid waste.

This work consists of excavating, segregating, temporary stockpiling, loading, hauling, and disposing of solid waste material at a WDNR-approved disposal facility. The nearest WDNR-approved disposal facilities are:

Advanced Disposal Emerald Park Landfill
W124 S10629 S. 124th St
Muskego, WI 53150
(414) 529-1360

Waste Management Orchard Ridge Landfill
N96W13503 County Line Road
Menomonee Falls, WI 53051
(262) 532-6200

Provide information to the environmental consultant and engineer that indicates the WDNR-approved disposal facility that the contractor will use.

A.2 Notice to the Contractor – Solid Waste (Contaminated Soil) Locations

The department and others completed hazardous materials assessment for locations within this project where excavation is required. Investigation for soil contamination was conducted at select locations. Results indicate that contaminated soil classified as solid waste is present at the following locations as shown on the plans:

- Station 1+75PR to 2+00PR, from 50 feet to 75 feet right of reference line, from approximately 1' to 5' bgs. Soil at this location is contaminated with lead. Approximately 51 cubic yards (approximately 87 tons at an estimated 1.7 tons per cubic yard) of lead-contaminated soil will be excavated from this location for grading.
- Station 2+45PR to 2+65PR, from 85 feet to 110 feet right of reference line, from approximately 1' to 5' bgs. Soil at this location is contaminated with lead. Approximately 75 cubic yards (approximately 128 tons at an estimated 1.7 tons per cubic yard) of lead-contaminated soil will be excavated from this location for grading.
- Station 2+75PR to 3+00PR, from 15 feet to 35 feet left of reference line, from approximately 1' to 5' bgs. Soil at this location is contaminated with arsenic. Approximately 24 cubic yards (approximately 41 tons at an estimated 1.7 tons per cubic yard) of lead-contaminated soil will be excavated from this location for grading.

- Station 3+35PR to 3+60PR, from 100 feet to 120 feet right of reference line, from approximately 5' to 9+' bgs. Soil at this location is contaminated with arsenic. Approximately 1 cubic yard (approximately 1.7 tons at an estimated 1.7 tons per cubic yard) of arsenic-contaminated soil will be excavated from this location for grading and storm sewer installation.
- Station 5+15PR to 5+60PR, from 95 feet to 130 feet left of reference line, from approximately 1' to 9+' bgs. Soil at this location is contaminated with arsenic and lead. Approximately 95 cubic yards (approximately 162 tons at an estimated 1.7 tons per cubic yard) of arsenic- and lead-contaminated soil will be excavated from this location for grading and storm sewer installation.
- Station 5+60PR to 6+35PR, from project limits left to 30 feet right of reference line, from approximately 0' to 4' bgs. Soil at this location contains industrial fill/waste (including some foundry sand and slag) and is contaminated with petroleum and metals (lead, mercury, and arsenic). Approximately 1,630 cubic yards (approximately 2,770 tons at an estimated 1.7 tons per cubic yard) of industrial fill/waste and contaminated soil will be excavated from this location for grading.
- Station 6+35PR to 7+50PR, from project limits left to project limits right, from approximately 0' to 4' bgs. Soil at this location contains industrial fill/waste (including some foundry sand and slag) and is contaminated with petroleum and metals (lead, mercury, and arsenic). Approximately 1,466 cubic yards (approximately 2,500 tons at an estimated 1.7 tons per cubic yard) of industrial fill/waste and contaminated soil will be excavated from this location for grading.

Directly load solid waste excavated by the project at the above locations into trucks that will transport the material to a WDNR-licensed landfill facility for landfill disposal.

A.3 Notice to the Contractor – Contaminated Soil Beyond the Construction Limits

If obviously contaminated soils or other signs of NR 500 non-exempt solid waste and hazardous materials are unexpectedly encountered elsewhere on the project, terminate excavation activities in the area and notify the engineer. Examples of these unexpected conditions may include, but are not limited to, buried containers or tanks, noxious odors and fumes, stained soils, sheen on ground water, other industrial wastes, and significant volumes of municipal or domestic garbage.

No active groundwater monitoring wells were observed within the construction limits. If active groundwater monitoring wells are encountered during construction, notify the engineer and protect them to maintain their integrity. The environmental consultant will determine if monitoring wells need to be maintained. For monitoring wells that do need to be maintained, adjust the wells that do not conflict with structures or curb and gutter to be flush with the final grade. For wells that conflict with the previously mentioned items or if monitoring wells are not required to be maintained, they will be abandoned by others.

If dewatering is required at the above locations, conduct the dewatering in accordance to Section C below.

A.4 Excavation Management Plan Approval

The excavation management plan for this project has been designed to minimize the off-site disposal of contaminated waste. The excavation management plan, including these special provisions, has been developed in cooperation with the WDNR. The WDNR concurrence letter is on file at the Wisconsin Department of Transportation. For further information regarding previous investigation and remediation activities in these areas contact:

Name: Andrew Malsom, HAZMAT and Environmental Engineer
Address: WisDOT SE region, 141 NW Barstow St., Waukesha WI 53187
Phone: (262) 548-6705
Fax: (262) 548-6891
E-mail: Andrew.Malsom@dot.wi.gov

A.5 Coordination

Coordinate work under this contract with the environment consultant:

Consultant: TRC Environmental Corporation
Address: 150 N. Patrick Blvd. Ste. 180, Brookfield, WI 53045
Contact: Bryan Bergmann, P.G.
Phone: 262-901-2126
Fax: 262-879-1220
E-mail: bbergmann@trcsolutions.com

The role of the environmental consultant will be limited to:

1. Determining the location and limits of solid waste to be excavated based on soil analytical results from previous investigations, visual observations, and field screening of soil that is excavated;
2. Identifying soils to be hauled to the landfill facility;
3. Documenting that activities associated with management of solid waste are in conformance with the solid waste management methods for this project as specified herein; and
4. Obtaining the necessary approvals for disposal of solid waste from the landfill facility.

Provide at least a 14-calendar day notice of the preconstruction conference date to the environmental consultant. At the preconstruction conference, provide a schedule for all excavation activities in the area of solid waste described in A.2 to the environmental consultant. Identify the WDNR licensed landfill facility that will be used for disposal of solid waste, and provide this information to the environmental consultant no later than 30 calendar days prior to commencement of excavation in the impacted area or at the preconstruction conference, whichever comes first. The environmental consultant will be responsible for obtaining the necessary approvals from the landfill facility for disposal of the solid waste.

Coordinate with the environmental consultant to ensure that the environmental consultant is present during excavation in the impacted areas. Notify the environmental consultant at least three calendar days prior to commencement of excavation in the impacted area. Perform excavation in the impacted area on a continuous basis until excavation work is completed. Do not transport soil containing solid waste offsite without prior approval from the environmental consultant.

A.6 Health and Safety Requirements

Supplement standard spec 107.1 with the following:

During excavation activities, expect to encounter soil contaminated with regulated organic compounds and metals. Site workers taking part in activities that will result in the reasonable probability of exposure to safety and health hazards associated with hazardous materials shall have completed health and safety training that meets the Occupational Safety and Health Administration (OSHA) requirements for Hazardous Waste Operations and Emergency Response (HAZWOPER), as provided in 29 CFR 1910.120.

Prepare a site-specific Health and Safety Plan, and develop, delineate and enforce the health and safety exclusion zones for each impacted area as required by 29 CFR 1910.120. Submit the site-specific health and safety plan and written documentation of up-to-date OSHA training to the engineer prior to the start of work.

B (Vacant)

C Construction

Supplement standard spec 205.3 with the following:

Control operations in the impacted area to minimize the quantity of soil excavated.

The environmental consultant will periodically monitor soil excavated from the areas identified in A.2 above. The environmental consultant will evaluate excavated soil based on field screening results, visual observations, and soil analytical results from previous environmental investigations. Assist the environmental consultant in collecting soil samples for evaluation using excavation equipment. The sampling frequency shall be a maximum of one sample for every 20 cubic yards excavated.

Directly load and haul solid waste designated by the environmental consultant for offsite disposal to the WDNR approved landfill facility. Use loading and hauling practices that are appropriate to prevent any spills or releases of the material. Prior to transport, sufficiently dewater soils designated for off-site disposal so as not to contain free liquids.

Verify that the vehicles used to transport material are licensed for such activity in accordance to applicable state and federal regulations. Obtain the necessary disposal facility approvals and WDNR approvals for disposal. Do not transport regulated solid waste off-site without obtaining the approval of the environmental consultant and engineer and notifying the disposal facility.

During excavations in the areas of known contamination, larger chunks of clean concrete (~2 cubic feet), asphalt and bricks will be segregated from the fill, to the extent practical and managed as common excavation. Under NR 500.08 this material is exempt from licensing and requirements of Wisconsin Administrative Code NR 500-538 of the solid waste regulations, and will be reused as designated by the engineer as fill on the project, or it will be disposed of off-site at the contractor's disposal site(s).

If dewatering is required in areas of known contamination, water generated from dewatering activities may contain VOCs and/or metals. Such water may, with approval of the Milwaukee Metropolitan Sewerage District (MMSD), be discharged to the sanitary sewer as follows:

1. Meet all applicable requirements of the MMSD including the control of suspended solids. Perform all necessary monitoring to document compliance with MMSD's requirements. Furnish, install, operate, maintain, disassemble, and remove treatment equipment necessary to comply with MMSD's requirements.
2. Ensure continuous dewatering and excavation safety at all times. Provide, operate, and maintain adequate pumping equipment and drainage and disposal facilities.

Notify the engineer of any dewatering activities, and obtain any permits necessary to discharge water. Provide copies of such permits to the engineer. Meet any requirements and pay any costs for obtaining and complying with such permit use. Follow all applicable legislative statutes, judiciary decisions, and regulations of the State of Wisconsin.

Costs associated with excavation dewatering in contaminated areas are considered incidental to this pay item. The Wisconsin Department of Transportation will be the generator of regulated solid waste from this construction project.

D Measurement

The department will measure Management of Solid Waste by the ton of waste accepted by the disposal facility and as documented by weight tickets, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0195.0001	Management of Solid Waste	Ton

Payment is full compensation for excavating, segregating, loading, hauling, and landfill disposal of solid waste; obtaining solid waste collection and transportation service operating licenses; assisting in the collection of soil samples for field evaluation; dewatering of soils prior to transport, if necessary.

99. River Stone, Item SPV.0195.7001.

A Description

This special provision describes furnishing and placing river stone material.

B Materials

Furnish multicolor, round river rock from a department approved source, substantially free of unconsolidated overburden materials, topsoil, organic materials, and other deleterious materials.

A department approved source is a source with acceptable department test results for wear and soundness on record. The engineer may also approve a source the engineer judges to be sound, hard, durable, and of a suitable texture and composition. The engineer may reject material from deteriorated or non-durable rock. Material to be 1-inch to 2- inch diameter washed stone, no fines.

C Construction

Place river stone materials where the plans show or where the engineer directs. Install over weed fabric 3-inches deep so weed fabric is not visible. Use hand methods to shape, consolidate, and orient within area and around plant material.

D Measurement

The department will measure River Stone by the ton in-place, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0195.7001	River Stone	TON

Payment is full compensation for furnishing and installing river stone materials.

ADDITIONAL SPECIAL PROVISION 4

Payment to First-Tier Subcontractors

Within 10 calendar days of receiving a progress payment for work completed by a subcontractor, pay the subcontractor for that work. The prime contractor may withhold payment to a subcontractor if, within 10 calendar days of receipt of that progress payment, the prime contractor provides written notification to the subcontractor and the department documenting "just cause" for withholding payment.

The prime contractor may also withhold routine retainage from payments due subcontractors.

Payment to Lower-Tier Subcontractors

Ensure that subcontracting agreements at all tiers provide prompt payment rights to lower-tier subcontractors that parallel those granted first-tier subcontractors in this provision.

Release of Routine Retainage

After granting substantial completion the department may reduce the routine retainage withheld from the prime contractor to 75 percent of the original total amount retained.

When the Department sends the semi-final estimate the department may reduce the routine retainage withheld from the prime contractor to 10 percent of the original total amount retained.

Within 30 calendar days of receiving the semi-final estimate from the department, submit written certification that subcontractors at all tiers are paid in full for acceptably completed work and that no routine retainage is being withheld. The department will pay the prime contractor in full and reduce the routine retainage withheld from the prime contractor to zero when the department approves the final estimate.

This special provision does not limit the right of the department, prime contractor, or subcontractors at any tier to withhold payment for work not acceptably completed or work subject to an unresolved contract dispute.

ADDITIONAL SPECIAL PROVISION 6

ASP 6 - Modifications to the standard specifications

Make the following revisions to the standard specifications:

450.3.2.1 General

Replace the entire text with the following effective with the January 2015 letting:

- (1) Do not place asphaltic mixture when the air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is less than 36 F for upper layers or 32 F for lower layers unless the engineer allows in writing. The contractor should place HMA pavement for projects on or north of STH 29 between May 1 and October 15 inclusive and for projects south of STH 29 between April 15 and November 1 inclusive. Notify the engineer at least one business day before paving.
 - (2) Unless the contract specifies otherwise, conform to the following:
 - Keep the road open to all traffic during construction.
 - Prepare the existing foundation for treatment as specified in 211.
 - Incorporate loose roadbed aggregate as a part of preparing the foundation, in shoulder construction, or dispose of as the engineer approves.
 - (3) Place asphaltic mixture only on a prepared, firm, and compacted base, foundation layer, or existing pavement substantially surface-dry and free of loose and foreign material. Do not place over frozen subgrade or base, or where the roadbed is unstable.
-

450.5 Payment

Replace the entire text with the following effective with the January 2015 letting:

- (1) All costs of furnishing, maintaining, and operating the truck scale or other weighing equipment and furnishing the weigh tickets are incidental to the contract.
 - (2) Nonconforming material allowed to remain in place is subject to price adjustment under 105.3.2.
 - (3) Full-depth sawing to remove integrally placed safety edge where not required is incidental to the contract.
 - (4) The contractor is responsible for pavement performance. If because of an excusable compensable delay under 108.10.3, the engineer directs the contractor to pave when the temperature is less than 36 F for the upper layer or less than 32 F for lower layers, the department:
 - Will relieve the contractor of responsibility for damage and defects the engineer attributes to cold weather paving.
 - Will not assess disincentives for density or ride.
-

455.3.2.1 General

Replace paragraphs one and two with the following effective with the January 2015 letting:

- (1) Apply tack coat only when the air temperature is 32 F or more unless the engineer approves otherwise in writing. Before applying tack coat ensure that the surface is dry and reasonably free of loose dirt, dust, or other foreign matter. Do not apply if weather or surface conditions are unfavorable or before impending rains.
- (2) Use tack material of the type and grade the contract specifies. The contractor may, with the engineer's approval, dilute tack material as allowed under 455.2.4. Provide calculations using the asphalt content as-received from the supplier and subsequent contractor dilutions to show that as-placed material has 50 percent or more residual asphalt content. Apply at 0.050 to 0.070 gallons per square yard, after dilution, unless the contract designates otherwise. The engineer may adjust the application rate based on surface conditions. Limit application each day to the area the contractor expects to pave during that day.

460.2.2.3 Aggregate Gradation Master Range

Replace paragraph one with the following effective with the December 2014 letting:

- (1) Ensure that the aggregate blend, including recycled material and mineral filler, conforms to the gradation requirements in table 460-1. The values listed are design limits; production values may exceed those limits.

TABLE 460-1 AGGREGATE GRADATION MASTER RANGE AND VMA REQUIREMENTS

SIEVE	PERCENTS PASSING DESIGNATED SIEVES						
	NOMINAL SIZE						
	37.5 mm	25.0 mm	19.0 mm	12.5 mm	9.5 mm	SMA 12.5 mm	SMA 9.5 mm
50.0-mm	100						
37.5-mm	90 – 100	100					
25.0-mm	90 max	90 - 100	100				
19.0-mm	—	90 max	90 - 100	100		100	
12.5-mm	—	—	90 max	90 - 100	100	90 - 97	100
9.5-mm	—	—	—	90 max	90 - 100	58 - 72	90 - 100
4.75-mm	—	—	—	—	90 max	25 - 35	35 - 45
2.36-mm	15 – 41	19 - 45	23 - 49	28 - 58	20 - 65	15 - 25	18 - 28
75-µm	0 – 6.0	1.0 - 7.0	2.0 - 8.0	2.0 - 10.0	2.0 - 10.0	8.0 - 12.0	10.0 - 14.0
% MINIMUM VMA	11.0	12.0	13.0	14.0 ^[1]	15.0 ^[2]	16.0	17.0

^[1] 14.5 for E-0.3 and E-3 mixes.

^[2] 15.5 for E-0.3 and E-3 mixes.

460.3.4 Cold Weather Paving

Add a new subsection as follows effective with the January 2015 letting:

460.3.4 Cold Weather Paving**460.3.4.1 Cold Weather Paving Plan**

- (1) Submit a written cold weather paving plan to the engineer at the preconstruction meeting. In that plan outline material, operational, and equipment changes for paving when the air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is less than 40 F. Include the following:
- Use a department-accepted HMA mix design that incorporates a warm mix additive from the department's approved products list. Do not use a foaming process.
 - Use additional rollers.

- (2) Engineer written acceptance is required for the cold weather paving plan. Engineer acceptance of the plan does not relieve the contractor of responsibility for pavement performance except as specified in 450.5(4).

460.3.4.2 Cold Weather Paving Operations

- (1) Do not place asphaltic mixture when the air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is less than 40 F unless a valid engineer-accepted cold weather paving plan is in effect.
- (2) If the national weather service forecast for the construction area predicts ambient air temperature less than 40 F at the projected time of paving within the next 24 hours, confirm or submit revisions to a previously engineer-accepted cold weather paving plan for engineer validation. Upon validation of the plan, the engineer will allow paving for the next day. Once in effect, pave conforming to the engineer-accepted cold weather paving plan for the balance of that work day or shift regardless of the temperature at the time of paving.

460.4 Measurement

Add paragraph two as follows effective with the January 2015 letting:

- (2) The department will measure HMA Cold Weather Paving by the ton of HMA mixture for pavement placed conforming to an engineer-accepted cold weather paving plan.

460.5.1 General

Revise paragraph one as follows effective with the January 2015 letting:

- (1) The department will pay for measured quantities at the contract unit price under the following bid items:

<u>ITEM NUMBER</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
460.1100	HMA Pavement Type E-0.3	TON
460.1101	HMA Pavement Type E-1	TON
460.1103	HMA Pavement Type E-3	TON
460.1110	HMA Pavement Type E-10	TON
460.1130	HMA Pavement Type E-30	TON
460.1132	HMA Pavement Type E-30X	TON
460.1700	HMA Pavement Type SMA	TON
460.2000	Incentive Density HMA Pavement	DOL
460.4000	HMA Cold Weather Paving	TON

460.5.2.2 Disincentive for HMA Pavement Density

Revise paragraph two as follows effective with the January 2015 letting:

- (2) The department will not assess density disincentives for pavement placed in cold weather because of a department-caused delay as specified in 450.5(4).

460.5.2.4 Cold Weather Paving

Add a new subsection as follows effective with the January 2015 letting:

460.5.2.4 Cold Weather Paving

- (1) Payment for HMA Cold Weather Paving is full compensation for additional materials and equipment specified for cold weather paving under 460.3.4 including costs for preparing, administering, and following the contractor's cold weather paving plan.
- (2) If HMA pavement is placed under 460.3.4 and the HMA Cold Weather Paving bid item is not in the contract, the department will pay for the additional costs specified in 460.5.2.4(1) as extra work. The department will pay separately for HMA pavement under the appropriate HMA Pavement bid items.

465.2 Materials

Replace paragraph two with the following effective with the December 2014 letting:

- (2) Under the other section 465 bid items, the contractor need not submit a mix design. Furnish aggregates mixed with a type AC asphaltic material, except under the Asphaltic Curb bid item furnish PG58-28 asphaltic material. Use coarse and fine mineral aggregates uniformly coated and mixed with the asphaltic material in an engineer-approved mixing plant. The contractor may include reclaimed asphaltic pavement materials in the mixture.

Bid Items Added

Add the following new bid item effective with the January 2015 letting:

<u>ITEM NUMBER</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
460.4000	HMA Cold Weather Paving	TON

Errata

Make the following corrections to the standard specifications:

501.3.2.4.4 Water Reducer

Correct errata by deleting the reference to footnote 6 for grade D concrete.

- (1) Add a water reducing admixture conforming to 501.2.3. Determine the specific type and rate of use based on the atmospheric conditions, the desired properties of the finished concrete and the manufacturer's recommended rate of use. The actual rate of use shall at least equal the manufacturer's recommended rate, and both the type and rate used require the engineer's approval before use.

ADDITIONAL SPECIAL PROVISION 7

- A. Reporting 1st Tier and DBE Payments During Construction
1. Comply with reporting requirements specified in the department's Civil Rights Compliance, Contractor's User Manual, Sublets and Payments.
 2. Report payments to all DBE firms within 10 calendar days of receipt of a progress payment by the department or a contractor for work performed, materials furnished, or materials stockpiled by a DBE firm. Report the payment as specified in A(1) for all work satisfactorily performed and for all materials furnished or stockpiled.
 3. Report payments to all first tier subcontractor relationships within 10 calendar days of receipt of a progress payment by the department for work performed. Report the payment as specified in A(1) for all work satisfactorily performed.
 4. All tiers shall report payments as necessary to comply with the DBE payment requirement as specified in A(2).
 5. Require all first tier relationships, DBE firms and all other tier relationships necessary to comply with the DBE payment requirement in receipt of a progress payment by contractor to acknowledge receipt of payment as specified in A(1), (2), (3) and (4).
 6. All agreements made by a contractor shall include the provisions in A(1), (2), (3), (4) and (5), and shall be binding on all first tier subcontractor relationships and all contractors and subcontractors utilizing DBE firms on the project.
- B. Costs for conforming to this special provision are incidental to the contract.

ADDITIONAL SPECIAL PROVISION 9
Electronic Certified Payroll Submittal

(1) Use the department's Civil Rights Compliance System (CRCS) to submit certified payrolls electronically. Details are available online through the department's highway construction contractor information (HCCI) site on the Labor, Wages, and EEO Information page at:

<http://www.dot.wi.gov/business/civilrights/laborwages/index.htm>

(2) Ensure that all tiers of subcontractors, as well as all trucking firms, submit their weekly certified payrolls electronically through CRCS. These payrolls are due within seven calendar days following the close of the payroll period. Every firm providing physical labor towards completing the project is a subcontractor under this special provision.

(3) Upon receipt of contract execution, promptly make all affected firms aware of the requirements under this special provision and arrange for them to receive CRCS training as they are about to begin payrolls. The department will provide training either in a classroom setting at one of our regional offices or by telephone. Contact Tess Mulrooney at 608-267-4489 to schedule the training.

(4) The department will reject all paper submittals of forms DT-1816 and DT-1929 for information required under this special provision. All costs for conforming to this special provision are incidental to the contract.

(5) Firms wishing to export payroll data from their computer system into CRCS should have their payroll coordinator send several sample electronic files to Tess two months before a payroll needs to be submitted. Not every contractor's payroll system is capable of producing export files. For details, see pages 17-22 of the CRCS System Background Information manual available online on the Labor, Wages, and EEO Information page at:

<http://www.dot.wi.gov/business/civilrights/laborwages/docs/crc-payroll-manual.pdf>

DECEMBER 2013

BUY AMERICA PROVISION

All steel and iron materials permanently incorporated in this project shall be domestic products and all manufacturing and coating processes for these materials from smelting forward in the manufacturing process must have occurred within the United States. Coating includes epoxy coating, galvanizing, painting and any other coating that protects or enhances the value of a material subject to the requirements of Buy America. The exemption of this requirement is the minimal use of foreign materials if the total cost of such material permanently incorporated in the product does not exceed one-tenth of one percent (1/10 of 1%) of the total contract cost or \$2,500.00, whichever is greater. For purposes of this paragraph, the cost is that shown to be the value of the subject products as they are delivered to the project. The contractor shall take actions and provide documentation conforming to CMM 2-28.5 to ensure compliance with this "Buy America" provision.

<http://roadwaystandards.dot.wi.gov/standards/cmm/cm-02-28.pdf#cm2-28.5>

Upon completion of the project certify to the engineer, in writing using department form WS4567, that all steel, iron, and coating processes for steel or iron incorporated into the contract work conform to these "Buy America" provisions. Attach a list of exemptions and their associated costs to the certification form. Department form WS4567 is available at:

<http://roadwaystandards.dot.wi.gov/standards/forms/ws4567.doc>

Effective with September 2004 Letting

**WISCONSIN DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS AND TRANSPORTATION FACILITIES**

SUPPLEMENTAL REQUIRED CONTRACT PROVISIONS

- I. Wage Rates, Hours of labor and payment of Wages
- II. Payroll Requirements
- III. Postings at the Site of the Work
- IV. Affidavits
- V. Wage Rate Redistribution
- VI. Additional Classifications

I. WAGE RATES, HOURS OF LABOR AND PAYMENT OF WAGES

The schedule of "Minimum Wage Rates" attached hereto and made a part hereof furnishes the prevailing wage rates that have been determined pursuant to Section 103.50 of the Wisconsin Statutes. These wage rates are the minimum required to be paid to the various laborers, workers, mechanics and truck drivers employed by contractors and subcontractors on the construction work embraced by the contract and subject to prevailing hours and wages under Section 103.50, Stats. If necessary to employ laborers, workers, mechanics or truck drivers whose classification is not listed on the schedule, they shall be paid at rates conformable to those listed for similar classifications. Apprentices shall be paid at rates not less than those prescribed in their state indenture contracts.

While the wage rates shown are the minimum rates required by the contract to be paid during its life, this is not a representation that labor can be obtained at these rates. It is the responsibility of bidders to inform themselves as to the local labor conditions and prospective changes or adjustments of wage rates. No increase in the contract price shall be allowed or authorized on account of the payment of wage rates in excess of those listed herein.

Pursuant to Section 103.50 of the Wisconsin Statutes, the prevailing hours of labor have been determined to be up to 10 hours per day and 40 hours per calendar week Monday through Friday. If any laborer, worker, mechanic or truck driver is permitted or required to work more than the prevailing number of hours per day or per calendar week on this contract, they shall be paid for all hours in excess of the prevailing hours at a rate of at least one and one-half (1 1/2) times their hourly rate of pay. All work on Saturday, Sunday and the following holidays is to be paid at time and a half: (1) January 1, (2) the last Monday in May, (3) July 4, (4) the first Monday in September, (5) the fourth Thursday in November, (6) December 25, (7) the day before if January 1, July 4 or December 25 falls on a Saturday and (8) the day following if January 1, July 4 or December 25 falls on a Sunday.

All laborers, workers, mechanics and truck drivers shall be paid unconditionally not less often than once a week. Persons who own and operate their own trucks must receive the prevailing truck driver rate for the applicable type of truck (i.e. 2 axle, 3 or more axle, articulated, eculid or dumptor) he or she operates, plus an agreed upon amount for the use of his or her truck. Every owner-operator MUST be paid separately for their driving and for the use of their truck.

For those projects subject to the requirements of the Davis-Bacon Act, the Secretary of Labor will also have determined "Minimum Wage Rates" for work to be performed under the contract. These rates are, for all or most of the labor, worker, mechanic or truck driver classifications, identical to those established under Section 103.50 of the Wisconsin Statutes. In the event the rates are not identical, the higher of the two rates will govern.

II. PAYROLL REQUIREMENTS

All contractors and subcontractors must submit weekly Certified Payrolls and Compliance Statement verifying that all laborers, workers, mechanics and truck drivers working on the project have been paid the prevailing wage rates for all work performed under the contract required by Section 103.50 of the Wisconsin Statutes.

III. POSTINGS AT THE SITE OF THE WORK

In addition to the required postings furnished by the Department, the contractor shall post the following in at least one conspicuous place at the site of work:

- a. "NOTICE TO EMPLOYEES," which provides information required to be posted by the provisions of Section 103.50 of the Wisconsin Statutes.
- b. A copy of the State of Wisconsin Minimum Wages Rates. (Four pages.)
- c. A copy of the contractor's Equal Employment Opportunity Policy.
- d. On any project involving federal aid, in addition to the furnished postings, the contractor shall post a copy of the "Davis-Bacon Act, Minimum Wage Rates". (Three pages.)

IV. WAGE RATE REDISTRIBUTION

The amount specified as the hourly basic rate of pay and the amount(s) specified as the fringe benefit contribution(s), for all classes of laborers, workers, mechanics or truck drivers may be redistributed, when necessary, to conform to those specified in any applicable collective bargaining agreement, provided that both parties to such agreement

request and receive the approval for any such redistribution from both the Department of Transportation and the Department of Workforce Development prior to the implementation of such redistribution.

V. ADDITIONAL CLASSIFICATIONS

Any unlisted laborer or mechanic classification that is needed to perform work on this project, and is not included within the scope of any of the classifications listed in the application prevailing wage rate determination, may be added after award only if all of the following criteria have been met:

1. The affected employer(s) must make a written request to WisDOT Central Office to utilize the unlisted classification on this project.
2. The request must indicate the scope of the work to be performed by the unlisted classification and must indicate the proposed wage/fringe benefit package that the unlisted classification is to receive.
3. The work to be performed by the unlisted classification must not be performed by a classification that is included in the applicable prevailing wage rate determination.
4. The unlisted classification must be commonly employed in the area where the project is located.
5. The proposed wage/fringe benefit package must bear a reasonable relationship to those set forth in the applicable prevailing wage rate determination.
6. The request should be made prior to the actual performance of the work by the unlisted classification.
7. DWD must approve the use of the unlisted classification and the proposed wage/fringe benefit package. USDOL also must approve the use of the unlisted classification and the proposed wage/fringe benefit package on federal aid projects.
8. WisDOT and DWD may amend the proposed wage/fringe benefit package, as deemed necessary, and may set forth specific employment ratios and scope of work requirements in the approval document.

The approved wage/fringe benefit package shall be paid to all laborers, workers, mechanics or truck drivers performing work within the scope of that performed by the unlisted classification, from the first day on which such work is performed. In the event that work is performed by the unlisted classification prior to approval, the wage/fringe benefit package to be paid for such work must be in conformance with the wage/fringe

benefit package approved for such work. Under this arrangement a retroactive adjustment in wages and/or fringe benefits may be required to be made to the affected laborers, workers, mechanics or truck drivers by the affected employer(s).

**ANNUAL PREVAILING WAGE RATE DETERMINATION
FOR ALL STATE HIGHWAY PROJECTS
MILWAUKEE COUNTY**

Compiled by the State of Wisconsin - Department of Workforce Development
for the Department of Transportation
Pursuant to s. 103.50, Stats.
Issued on May 1, 2014

CLASSIFICATION: Contractors are required to call the Department of Workforce Development if there are any questions regarding the proper trade or classification to be used for any worker on a public works project.

OVERTIME: Time and one-half must be paid for all hours worked over 10 hours per day and 40 hours per calendar week and for all hours worked on Saturday, Sunday and the following six (6) holidays: January 1; the last Monday in May; July 4; the 1st Monday in September; the 4th Thursday in November; December 25; the day before if January 1, July 4 or December 25 falls on a Saturday; the day following if January 1, July 4 or December 25 falls on a Sunday.

FUTURE INCREASE: If indicated for a specific trade or occupation, the full amount of such increase MUST be added to the "TOTAL" indicated for such trade or occupation on the date(s) such increase(s) becomes effective.

PREMIUM PAY: If indicated for a specific trade or occupation, the full amount of such pay MUST be added to the "HOURLY BASIC RATE OF PAY" indicated for such trade or occupation, whenever such pay is applicable.

SUBJOURNEY: Wage rates may be available for some of the classifications indicated below. Any employer that desires to use any subjourney classification on a project MUST request the applicable wage rate from the Department of Workforce Development PRIOR to the date such classification is used on such project. Form ERD-10880 is available for this purpose and can be obtained by writing to the Department of Workforce Development, Equal Rights Division, P.O. Box 8928, Madison, WI 53708.

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
Bricklayer, Blocklayer or Stonemason	35.80	16.87	52.67
Carpenter	33.68	19.81	53.49
Future Increase(s): Add \$1.25/hr on 6/2/2014. Premium Pay: DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.			
Cement Finisher	31.56	18.53	50.09
Future Increase(s): Add \$1.87 on 6/1/14; Add \$1.87 on 6/1/15; Add \$1.75 on 6/1/16. Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.40/hr when the Wisconsin Department of Transportation or responsible governing agency requires that work be performed at night under artificial illumination with traffic control and the work is completed after sunset and before sunrise.			
Electrician	32.82	22.61	55.43
Premium Pay: DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.			
Fence Erector	16.00	3.33	19.33
Ironworker	30.51	23.23	53.74
Line Constructor (Electrical)	38.25	17.63	55.88
Painter	21.87	11.37	33.24
Pavement Marking Operator	30.00	0.00	30.00
Piledriver	27.67	25.64	53.31
Roofer or Waterproofer	29.40	15.55	44.95
Teledata Technician or Installer	24.75	16.08	40.83
Tuckpointer, Caulker or Cleaner	34.57	16.42	50.99
Underwater Diver (Except on Great Lakes)	34.48	15.90	50.38
Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	34.43	15.24	49.67

TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
	\$	\$	\$
Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	30.60	15.07	45.67
Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	26.78	13.58	40.36
Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	24.86	12.97	37.83
Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	21.04	11.74	32.78

TRUCK DRIVERS

Single Axle or Two Axle	34.22	19.90	54.12
Three or More Axle	25.24	15.20	40.44
Articulated, Euclid, Dumptor, Off Road Material Hauler	29.27	20.40	49.67
Future Increase(s): Add \$1.75/hr on 6/1/14); Add \$1.25/hr on 6/1/15); Add \$1.30/hr on 6/1/16); Add \$1.25/hr on 6/1/17.			
Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.50/hr night work premium. See DOT'S website for details about the applicability of this night work premium at: http://www.dot.wi.gov/business/civilrights/laborwages/pwc.htm .			
Pavement Marking Vehicle	25.24	15.20	40.44
Shadow or Pilot Vehicle	34.22	19.90	54.12
Truck Mechanic	25.24	15.20	40.44

LABORERS

General Laborer	26.06	19.43	45.49
Future Increase(s): Add \$1.60/hr on 6/1/2014.			
Premium Pay: Add \$.15/hr for air tool operator, joint sawer and filler (pavement), vibrator or tamper operator (mechanical hand operated), chain saw operator and demolition burning torch laborer; Add \$.35/hr for bituminous worker (raker and luteman), formsetter (curb, sidewalk and pavement) and strike off man; Add \$.50/hr for line and grade specialist; Add \$.65/hr for blaster and powderman; Add \$2.01/hr for topman; Add \$2.46/hr for bottomman; Add \$3.23/hr for pipelayer. / DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.25/hr for work on projects involving temporary traffic control setup, for lane and shoulder closures, when work under artificial illumination conditions is necessary as required by the project provisions (including prep time prior to and/or cleanup after such time period).			
Asbestos Abatement Worker	19.00	0.00	19.00
Landscaper	26.06	19.43	45.49
Future Increase(s): Add \$1.60/hr on 6/1/14.			
Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.25/hr for work on projects involving temporary traffic control setup, for lane and shoulder closures, when work under artificial illumination conditions is necessary as required by the project provisions (including prep time prior to and/or cleanup after such time period).			
Flagperson or Traffic Control Person	22.55	19.43	41.98
Future Increase(s): Add \$1.60/hr on 6/1/2014.			
Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.25/hr when the Wisconsin Department of Transportation or responsible governing agency requires that work be performed at night under artificial illumination with traffic control and the work is completed after sunset and before sunrise.			
Fiber Optic Laborer (Outside, Other Than Concrete Encased)	17.69	15.50	33.19
Railroad Track Laborer	13.50	4.06	17.56

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$
HEAVY EQUIPMENT OPERATORS			
Crane, Tower Crane, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 176 Ft or Over; Crane, Tower Crane, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons, Self-Erecting Tower Crane With a Lifting Capacity Of Over 4,000 Lbs., Crane With Boom Dollies; Traveling Crane (Bridge Type). Future Increase(s): Add \$1.75/hr on 6/1/2014); Add \$1.25/hr on 6/1/2015); Add \$1.30/hr on 6/1/2016); Add \$1.25/hr on 6/ 1/ 2017. Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.50/hr night work premium. See DOT'S website for details about the applicability of this night work premium at: http:// www.dot.wi.gov/business/civilrights/laborwages/pwc. htm .	36.72	20.40	57.12
Backhoe (Track Type) Having a Mfrg.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 175 Ft or Under; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under, Self-Erecting Tower Crane With A Lifting Capacity Of 4,000 Lbs., & Under; Dredge (NOT Performing Work on the Great Lakes); Licensed Boat Pilot (NOT Performing Work on the Great Lakes); Pile Driver. Future Increase(s): Add \$1.75/hr on 6/1/2014); Add \$1.25/hr on 6/1/2015); Add \$1.30/hr on 6/1/2016); Add \$1.25/hr on 6/ 1/ 2017. Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.50/hr night work premium. See DOT'S website for details about the applicability of this night work premium at: http:// www.dot.wi.gov/business/civilrights/laborwages/pwc. htm .	36.22	20.40	56.62
Air Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Asphalt Heater, Planer & Scarifier; Asphalt Milling Machine; Asphalt Screed; Automatic Subgrader (Concrete); Backhoe (Track Type) Having a Mfrg.'s Rated Capacity of Under 130,000 Lbs., Backhoe (Mini, 15,000 Lbs. & Under); Bituminous (Asphalt) Plant & Paver, Screed; Boatmen (NOT Performing Work on the Great Lakes); Boring Machine (Directional, Horizontal or Vertical); Bridge (Bidwell) Paver; Bulldozer or Endloader; Concrete Batch Plant, Batch Hopper; Concrete Breaker (Large, Auto, Vibratory/Sonic, Manual or Remote); Concrete Bump Cutter, Grinder, Planing or Grooving Machine; Concrete Conveyor System; Concrete Laser/Screed; Concrete Paver (Slipform); Concrete Pump, Concrete Conveyor (Rotec or Bidwell Type); Concrete Slipform Placer Curb & Gutter Machine; Concrete Spreader & Distributor; Crane (Carry Deck, Mini) or Truck Mounted Hydraulic Crane (10 Tons or Under); Crane With a Lifting Capacity of 25 Tons or Under; Forestry Equipment, Timbco, Tree Shear, Tub Grinder, Processor; Gradall (Cruz-Aire Type); Grader or Motor Patrol; Grout Pump; Hydro-Blaster (10,000 PSI or Over); Loading Machine (Conveyor); Material or Stack Hoist; Mechanic or Welder; Milling Machine; Post Hole Digger or Driver; Roller (Over 5 Ton); Scraper (Self Propelled or Tractor Drawn) 5 cu yds or More Capacity; Shoulder Widener; Sideboom; Skid Rig; Stabilizing or Concrete Mixer (Self-Propelled or 14S or Over); Straddle Carrier or Travel Lift; Tractor (Scraper, Dozer, Pusher, Loader); Tractor or Truck Mounted Hydraulic Backhoe; Trencher (Wheel Type or Chain Type); Tube Finisher; Tugger (NOT Performing Work on the Great Lakes); Winches	35.72	20.40	56.12

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
	\$	\$	\$

& A- Frames.			
Future Increase(s): Add \$1.75/hr on 6/1/2014); Add \$1.25/hr on 6/1/2015); Add \$1.30/hr on 6/1/2016); Add \$1.25/hr on 6/ 1/ 2017.			
Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.50/hr night work premium. See DOT'S website for details about the applicability of this night work premium at: http://www.dot.wi.gov/business/civilrights/laborwages/pwc.htm .			

Belting, Burlap, Texturing Machine; Broom or Sweeper; Compactor (Self-Propelled or Tractor Mounted, Towed & Light Equipment); Concrete Finishing Machine (Road Type); Environmental Burner; Farm or Industrial Type Tractor; Fireman (Asphalt Plant, Pile Driver & Derrick NOT Performing Work on the Great Lakes); Forklift; Greaser; Hoist (Tugger, Automatic); Jeep Digger; Joint Sawyer (Multiple Blade); Launch (NOT Performing Work on the Great Lakes); Lift Slab Machine; Mechanical Float; Mulcher; Power Subgrader; Robotic Tool Carrier (With or Without Attachments); Roller (Rubber Tire, 5 Ton or Under); Self Propelled Chip Spreader; Shouldering Machine; Skid Steer Loader (With or Without Attachments); Telehandler; Tining or Curing Machine.	35.46	20.40	55.86
Future Increase(s): Add \$1.75/hr on 6/1/2014); Add \$1.25/hr on 6/1/2015); Add \$1.30/hr on 6/1/2016); Add \$1.25/hr on 6/ 1/ 2017.			
Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.50/hr night work premium. See DOT'S website for details about the applicability of this night work premium at: http://www.dot.wi.gov/business/civilrights/laborwages/pwc.htm .			

Air Compressor (&/or 400 CFM or Over); Air, Electric or Hydraulic Jacking System; Augers (Vertical & Horizontal); Automatic Belt Conveyor & Surge Bin; Boiler (Temporary Heat); Concrete Proportioning Plant; Crusher, Screening or Wash Plant; Generator (&/or 150 KW or Over); Heaters (Mechanical); High Pressure Utility Locating Machine (Daylighting Machine); Mudjack; Oiler; Prestress Machine; Pug Mill; Pump (3 Inch or Over) or Well Points; Rock, Stone Breaker; Screed (Milling Machine); Stump Chipper; Tank Car Heaters; Vibratory Hammer or Extractor, Power Pack.	35.17	20.40	55.57
Future Increase(s): Add \$1.75/hr on 6/1/2014); Add \$1.25/hr on 6/1/2015); Add \$1.30/hr on 6/1/2016); Add \$1.25/hr on 6/ 1/ 2017.			
Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add \$1.50/hr night work premium. See DOT'S website for details about the applicability of this night work premium at: http://www.dot.wi.gov/business/civilrights/laborwages/pwc.htm .			

Fiber Optic Cable Equipment.	26.69	16.65	43.34
Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	38.80	20.17	58.97

Work Performed on the Great Lakes Including 70 Ton & Over Tug Operator; Assistant Hydraulic Dredge Engineer; Crane or Backhoe Operator; Hydraulic Dredge Leverman or Diver's Tender; Mechanic or Welder.	38.80	20.17	58.97

Work Performed on the Great Lakes Including Deck Equipment Operator or Machineryman (Maintains Cranes Over 50 Tons or Backhoes 115,000 Lbs. or More); Tug, Launch or Loader, Dozer or Like Equipment When Operated on a Barge, Breakwater Wall, Slip, Dock or Scow, Deck Machinery.	34.50	20.04	54.54

Work Performed on the Great Lakes Including Deck Equipment Operator, Machineryman or Fireman (Operates 4 Units or More or Maintains Cranes 50 Tons or Under or Backhoes 115,000 Lbs. or Under); Deck Hand, Deck Engineer or Assistant Tug Operator; Off Road Trucks-Great Lakes ONLY.	34.50	20.04	54.54

<u>TRADE OR OCCUPATION</u>	<u>HOURLY BASIC RATE OF PAY</u>	<u>HOURLY FRINGE BENEFITS</u>	<u>TOTAL</u>
-----	\$-----	\$-----	\$-----

State of Wisconsin Department of Workforce Development Equal Rights Division	DEPARTMENTAL ORDER
ISSUE DATE: 1/22/2015	
PROJECT:	
ZOO IC, DPW SITE FACILITIES WAUWATOSA CITY, MILWAUKEE COUNTY, WI Determination No. 201500271 [Owner Project No. 10603473]	
PROJECT OWNER:	REQUESTER:
JOSHUA LEVEQUE, PROJECT MANAGER WISCONSIN DEPARTMENT OF TRANSPORTATION 141 NW BARSTOW ST. - PO BOX 798 WAUKESHA, WI 531879990	JOSHUA LEVEQUE, PROJECT MANAGER WISCONSIN DEPARTMENT OF TRANSPORTATION 141 NW BARSTOW ST. - PO BOX 798 WAUKESHA, WI 531879990
ADDITIONAL CONTACT:	NOTE: The Requester must provide a copy of this Project Determination and enclosures to the Project Owner and Additional Contact.
<p>The department received an application for prevailing wage rate determination for the above-captioned project. The department conducted a survey to determine the prevailing wage rate for the trade(s) or occupation(s) needed to complete the project. The survey's findings appear in the attached project determination.</p> <p>If you believe that the wage rate for any trade or occupation does not accurately reflect the prevailing wage rate in the city, village or town where the project is located, you may ask the department to conduct an administrative review of such wage rate. You must submit this request in writing within 30 days from the date indicated above. Additionally, your request must include wage rate information from at least three similar projects in the city, village or town where the proposed project is located and on which some work has been performed by the contested trade(s) during the current survey period and was previously considered by the department in issuing the attached determination. See DWD 290.10 of the Wisconsin Administrative Code and either s. 66.0903(3)(br), Stats., or s. 103.49(3)(c), Stats., for a complete explanation of the administrative review process.</p> <p>Enclosures</p>	
<p>It is hereby ordered that the prevailing wage rates set forth in the attached project determination shall only be applicable to the above referenced project. This order is a FINAL ORDER of the department unless a timely request for an administrative review is filed with the department.</p> <p>ISSUED BY:</p> <p style="text-align: center;">Equal Rights Division Labor Standards Bureau Construction Wage Standards Section P.O. Box 8928, Madison, WI 53708-8928 (608)266-6861</p> <p style="text-align: center;">Web Site: http://dwd.wisconsin.gov/er/</p>	

PREVAILING WAGE RATE DETERMINATION

Issued by the State of Wisconsin
Department of Workforce Development
Pursuant to s. 103.49, Wis. Stats.
Issued On: 1/22/2015

DETERMINATION NUMBER: 201500271

EXPIRATION DATE: Prime Contracts MUST Be Awarded or Negotiated On Or Before 12/31/2015. If NOT, You MUST Reapply.

PROJECT NAME: ZOO IC, DPW SITE FACILITIES
PROJECT NO: 10603473

PROJECT LOCATION: WAUWATOSA CITY, MILWAUKEE COUNTY, WI

CONTRACTING AGENCY: WISCONSIN DEPARTMENT OF TRANSPORTATION

CLASSIFICATION:	Contractors are responsible for correctly classifying their workers. Either call the Department of Workforce Development (DWD) with trade or classification questions or consult DWD's Dictionary of Occupational Classifications & Work Descriptions on the DWD website at: dwd.wisconsin.gov/er/prevailing_wage_rate/Dictionary/dictionary_main.htm .
OVERTIME:	<p>Time and one-half must be paid for all hours worked:</p> <ul style="list-style-type: none">- over 10 hours per day on prevailing wage projects- over 40 hours per calendar week- Saturday and Sunday- on all of the following holidays: January 1; the last Monday in May; July 4; the 1st Monday in September; the 4th Thursday in November; December 25;- The day before if January 1, July 4 or December 25 falls on a Saturday;- The day following if January 1, July 4 or December 25 falls on a Sunday. <p>Apply the time and one-half overtime calculation to whichever is higher between the Hourly Basic Rate listed on this project determination or the employee's regular hourly rate of pay. Add any applicable Premium or DOT Premium to the Hourly Basic Rate before calculating overtime.</p> <p>A DOT Premium (discussed below) may supersede this time and one-half requirement.</p>
FUTURE INCREASE:	When a specific trade or occupation requires a future increase, you MUST add the full hourly increase to the "TOTAL" on the effective date(s) indicated for the specific trade or occupation.
PREMIUM PAY:	If indicated for a specific trade or occupation, the full amount of such pay MUST be added to the "HOURLY BASIC RATE OF PAY" indicated for such trade or occupation, whenever such pay is applicable.
DOT PREMIUM:	This premium only applies to highway and bridge projects owned by the Wisconsin Department of Transportation and to the project type heading "Airport Pavement or State Highway Construction." DO NOT apply the premium calculation under any other project type on this determination.
APPRENTICES:	Pay apprentices a percentage of the applicable journey person's hourly basic rate of pay and hourly fringe benefit contributions specified in this determination. Obtain the appropriate percentage from each apprentice's contract or indenture.
SUBJOURNEY:	Subjourney wage rates may be available for some of the trades or occupations indicated below with the exception of laborers, truck drivers and heavy equipment operators. Any employer interested in using a subjourney classification on this project MUST complete Form ERD-10880 and request the applicable wage rate from the Department of Workforce Development PRIOR to using the subjourney worker on this project.

This document **MUST BE POSTED** by the **CONTRACTING AGENCY** in at least one conspicuous and easily accessible place **on the site of the project**. A local governmental unit may post this document at the place normally used to post public notices if there is no common site on the project. This document **MUST** remain posted during the entire time any worker is employed on the project and **MUST** be physically incorporated into the specifications and all contracts and subcontracts. If you have any questions, please write to the Equal Rights Division, Labor Standards Bureau, P.O. Box 8928, Madison, Wisconsin 53708 or call (608) 266-6861.

The following statutory provisions apply to state agency projects of public works and are set forth below pursuant to the requirements of s. 103.49(3)(a), Stats.

s. 103.49 (1) (c) "PREVAILING HOURS OF LABOR" for any trade or occupation in any area means 10 hours per day and 40 hours per week and may not include any hours worked on a Saturday or Sunday or on any of the following holidays:

1. January 1.
2. The last Monday in May.
3. July 4.
4. The first Monday in September.
5. The 4th Thursday in November.
6. December 25.
7. The day before if January 1, July 4 or December 25 falls on a Saturday.
8. The day following if January 1, July 4 or December 25 falls on a Sunday.

s. 103.49 (2) PREVAILING WAGE RATES AND HOURS OF LABOR.

Any contract made for the erection, construction, remodeling, repairing, or demolition of any project of public works to which the state or any state agency is a party shall contain a stipulation that no person performing the work described in sub. (2m) may be permitted to work a greater number of hours per day or per week than the prevailing hours of labor, except that any such person may be permitted or required to work more than such prevailing hours of labor per day and per week if he or she is paid for all hours worked in excess of the prevailing hours of labor at a rate of at least 1.5 times his or her hourly basic rate of pay; nor may he or she be paid less than the prevailing wage rate determined under sub. (3) in the same or most similar trade or occupation in the area in which the project of public works is situated. A reference to the prevailing wage rates determined under sub. (3) and the prevailing hours of labor shall be published in the notice issued for the purpose of securing bids for the project. If any contract or subcontract for a project of public works that is subject to this section is entered into, the prevailing wage rates determined under sub. (3) and the prevailing hours of labor shall be physically incorporated into and made a part of the contract or subcontract, except that for a minor subcontract, as determined by the department, the department shall prescribe by rule the method of notifying the minor subcontractor of the prevailing wage rates and prevailing hours of labor applicable to the minor subcontract. The prevailing wage rates and prevailing hours of labor applicable to a contract or subcontract may not be changed during the time that the contract or subcontract is in force.

s. 103.49 (6M) LIABILITY AND PENALTIES.

- (ag) 1. Any contractor, subcontractor, or contractor's or subcontractor's agent who fails to pay the prevailing wage rate determined by the department under sub. (3) or who pays less than 1.5 times the hourly basic rate of pay for all hours worked in excess of the prevailing hours of labor is liable to any affected employee in the amount of his or her unpaid wages or his or her unpaid overtime compensation and in an additional amount as liquidated damages as provided in subd. 2., 3., whichever is applicable.
2. If the department determines upon inspection under sub. (5) (b) or (c) that a contractor, subcontractor, or contractor's or subcontractor's agent has failed to pay the prevailing wage rate determined by the department under sub. (3) or has paid less than 1.5 times the hourly basic rate of pay for all hours worked in excess of the prevailing hours of labor, the department shall order the contractor to pay to any affected employee the amount of his or her unpaid wages or his or her unpaid overtime compensation and an additional amount equal to 100 percent of the amount of those unpaid wages or that unpaid overtime compensation as liquidated damages within a period specified by the department in the order.
3. In addition to or in lieu of recovering the liability specified in subd. 1. as provided in subd. 2., any employee for and in behalf of that employee and other employees similarly situated may commence an action to recover that liability in any court of competent jurisdiction. If the court finds that a contractor, subcontractor, or contractor's or subcontractor's agent has failed to pay the prevailing wage rate determined by the department under sub. (3) or has paid less than 1.5 times the hourly basic rate of pay for all hours worked in excess of the prevailing hours of labor, the court shall order the contractor, subcontractor, or agent to pay to any affected employee the amount of his or her unpaid wages or his or her unpaid overtime compensation and an additional amount equal to 100 percent of the amount of those unpaid wages or that unpaid overtime compensation as liquidated damages.

5. No employee may be a party plaintiff to an action under subd. 3. unless the employee consents in writing to become a party and the consent is filed in the court in which the action is brought. Notwithstanding s. 814.04 (1), the court shall, in addition to any judgment awarded to the plaintiff, allow reasonable attorney fees and costs to be paid by the defendant.

(am) Except as provided in pars. (b), (d) and (f), any contractor, subcontractor or contractor's or subcontractor's agent who violates this section may be fined not more than \$200 or imprisoned for not more than 6 months or both. Each day that a violation continues is a separate offense.

(b) Whoever induces any person who seeks to be or is employed on any project of public works that is subject to this section to give up, waive, or return any part of the wages to which the person is entitled under the contract governing the project, or who reduces the hourly basic rate of pay normally paid to a person for work on a project that is not subject to this section during a week in which the person works both on a project of public works that is subject to this section and on a project that is not subject to this section, by threat not to employ, by threat of dismissal from employment, or by any other means is guilty of an offense under s. 946.15 (1).

(c) Any person employed on a project of public works that is subject to this section who knowingly permits a contractor, subcontractor, or contractor's or subcontractor's agent to pay him or her less than the prevailing wage rate set forth in the contract governing the project, who gives up, waives, or returns any part of the compensation to which he or she is entitled under the contract, or who gives up, waives, or returns any part of the compensation to which he or she is normally entitled for work on a project that is not subject to this section during a week in which the person works both on a project of public works that is subject to this section and on a project that is not subject to this section, is guilty of an offense under s. 946.15 (2).

(d) Whoever induces any person who seeks to be or is employed on any project of public works that is subject to this section to permit any part of the wages to which the person is entitled under the contract governing the project to be deducted from the person's pay is guilty of an offense under s. 946.15 (3), unless the deduction would be permitted under 29 CFR 3.5 or 3.6 from a person who is working on a project that is subject to 40 USC 3142.

(e) Any person employed on a project of public works that is subject to this section who knowingly permits any part of the wages to which he or she is entitled under the contract governing the project to be deducted from his or her pay is guilty of an offense under s. 946.15 (4), unless the deduction would be permitted under 29 CFR 3.5 or 3.6 from a person who is working on a project that is subject to 40 USC 3142.

BUILDING OR HEAVY CONSTRUCTION

Includes sheltered enclosures with walk-in access for the purpose of housing persons, employees, machinery, equipment or supplies and non-sheltered work such as canals, dams, dikes, reservoirs, storage tanks, etc. A sheltered enclosure need not be "habitable" in order to be considered a building. The installation of machinery and/or equipment, both above and below grade level, does not change a project's character as a building. On-site grading, utility work and landscaping are included within this definition. Residential buildings of four (4) stories or less, agricultural buildings, parking lots and driveways are NOT included within this definition.

SKILLED TRADES

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
<u>CODE</u>	<u>TRADE OR OCCUPATION</u>	\$	\$	\$
101	Acoustic Ceiling Tile Installer Future Increase(s): Add \$1.50/hr on 6/1/2015; Add \$1.65/hr on 6/1/2016. Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	34.13	20.61	54.74
102	Boilermaker Future Increase(s): Add \$1.50/hr. on 01/01/2016	33.35	28.24	61.59
103	Bricklayer, Blocklayer or Stonemason Future Increase(s): Add \$1.35 on 06/01/2015; Add \$1.45 on 06/06/2016 Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	35.89	18.64	54.53
104	Cabinet Installer Future Increase(s): Add \$1.42/hr on 6/1/2015; Add \$1.42/hr on 6/1/2016.	32.72	16.00	48.72
105	Carpenter Future Increase(s): Add \$1.50/hr on 6/1/2015; Add \$1.65/hr on 6/1/2016. Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	34.13	20.61	54.74
106	Carpet Layer or Soft Floor Coverer	33.68	19.98	53.66
107	Cement Finisher Future Increase(s): Add \$1.30 on 06/01/2015; Add \$1.40 on 06/06/2016	32.09	19.21	51.30
108	Drywall Taper or Finisher Future Increase(s): Add \$.90/hr eff. 06/01/2015; Add \$1.00/hr eff. 06/01/2016; Add \$1.05/hr eff. 06/01/2017	29.97	20.74	50.71

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
109	Electrician Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	33.93	22.77	56.70
110	Elevator Constructor	43.84	27.09	70.93
111	Fence Erector	23.73	19.09	42.82
112	Fire Sprinkler Fitter	39.10	19.94	59.04
113	Glazier Future Increase(s): Add \$.75/hr eff. 06/01/2015; Add \$.90/hr eff. 06/01/2016	34.19	18.50	52.69
114	Heat or Frost Insulator	33.43	25.81	59.24
115	Insulator (Batt or Blown) Future Increase(s): Add \$1.42/hr on 6/1/2015; Add \$1.42/hr on 6/1/2016.	32.72	16.00	48.72
116	Ironworker Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	30.77	23.97	54.74
117	Lather	33.68	19.81	53.49
118	Line Constructor (Electrical)	37.43	18.19	55.62
119	Marble Finisher	20.00	0.52	20.52
120	Marble Mason	35.37	17.99	53.36
121	Metal Building Erector	22.05	8.08	30.13
122	Millwright	28.53	25.19	53.72
123	Overhead Door Installer	20.00	6.10	26.10
124	Painter Future Increase(s): Add \$.90/hr on 06/01/2015; Add \$1.00/hr on 06/01/2016; Add \$1.05/hr on 06/01/2017 Premium Increase(s): Add \$.20/hr for paperhanging; Add \$.35/hr for bridge, iron and drywall; Add \$.75/hr for spraying and sandblasting; Add \$.60/hr for EIFS work; Add \$1.00/hr for lead based paint removal.	29.62	20.74	50.36
125	Pavement Marking Operator	30.10	18.08	48.18

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
126	Piledriver Future Increase(s): Add \$1.50/hr on 6/1/2015; Add \$1.60/hr on 6/1/2016. Premium Increase(s): Add \$.65/hr for Piledriver Loftsmen; Add \$.75/hr for Sheet Piling Loftsmen. DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	30.11	26.51	56.62
127	Pipeline Fuser or Welder (Gas or Utility)	31.88	20.89	52.77
129	Plasterer Premium Increase(s): Add \$.40/hr for swing stage work.	31.21	19.93	51.14
130	Plumber	38.37	19.55	57.92
132	Refrigeration Mechanic Future Increase(s): Add \$1.70 on 6/1/15	41.01	21.54	62.55
133	Roofer or Waterproofor Future Increase(s): Add \$1.25/hr eff. 06/01/2015; Add \$1.25/hr eff. 06/01/2016	29.65	18.15	47.80
134	Sheet Metal Worker	36.94	20.22	57.16
135	Steamfitter	41.01	21.54	62.55
137	Teledata Technician or Installer Future Increase(s): Add \$.86/hr on 6/1/2015. Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	25.63	17.25	42.88
138	Temperature Control Installer	39.76	21.09	60.85
139	Terrazzo Finisher	20.00	0.52	20.52
140	Terrazzo Mechanic	31.18	17.35	48.53
141	Tile Finisher	24.24	17.54	41.78
142	Tile Setter	29.71	16.52	46.23
143	Tuckpointer, Caulker or Cleaner Future Increase(s): Add \$1.35 on 06/01/2015; Add \$1.45 on 06/01/2016 Premium Increase(s): DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	34.28	18.48	52.76
144	Underwater Diver (Except on Great Lakes)	35.40	15.90	51.30

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
<u>CODE</u>	<u>TRADE OR OCCUPATION</u>	\$	\$	\$
146	Well Driller or Pump Installer	25.32	15.65	40.97
147	Siding Installer	36.17	19.44	55.61
150	Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	30.16	15.11	45.27
151	Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	31.60	15.71	47.31
152	Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	27.65	14.49	42.14
153	Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	27.83	15.01	42.84
154	Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	24.00	11.57	35.57

TRUCK DRIVERS

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
<u>CODE</u>	<u>TRADE OR OCCUPATION</u>	\$	\$	\$
201	Single Axle or Two Axle	34.07	18.10	52.17
203	Three or More Axle	23.49	12.02	35.51
204	Articulated, Euclid, Dumptor, Off Road Material Hauler Future Increase(s): Add \$1.60/hr on 5/30/2016.	33.02	18.70	51.72
205	Pavement Marking Vehicle	20.85	11.02	31.87
207	Truck Mechanic	23.49	12.02	35.51

LABORERS

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
<u>CODE</u>	<u>TRADE OR OCCUPATION</u>	\$	\$	\$
301	General Laborer Future Increase(s): Add \$1.35/hr eff. 06/01/2015; Add \$1.25/hr eff. 06/06/2016 Premium Increase(s): Add \$.11 for mortar mixer, fork lift operator, air and electric equipment and power buggy operators; Add \$.22 for jackhammer operator, certified welder, gunite machineman.	29.01	17.22	46.23
302	Asbestos Abatement Worker	22.05	19.16	41.21
303	Landscaper	15.44	11.20	26.64
310	Gas or Utility Pipeline Laborer (Other Than Sewer and Water)	20.13	17.79	37.92

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
311	Fiber Optic Laborer (Outside, Other Than Concrete Encased) Premium Increase(s): DOT PREMIUMS: Pay two times the hourly basic rate on New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.	18.06	16.76	34.82
314	Railroad Track Laborer	14.50	4.39	18.89
315	Final Construction Clean-Up Worker	28.31	12.30	40.61

**HEAVY EQUIPMENT OPERATORS
SITE PREPARATION, UTILITY OR LANDSCAPING WORK ONLY**

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
501	Air Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Asphalt Milling Machine; Boring Machine (Directional, Horizontal or Vertical); Backhoe (Track Type) Having a Mfg'r's Rated Capacity of 130,000 Lbs. or Over; Backhoe (Track Type) Having a Mfg'r's Rated Capacity of Under 130,000 Lbs., Backhoe (Mini, 15,000 Lbs. & Under); Bulldozer or Endloader (Over 40 hp); Compactor (Self-Propelled 85 Ft Total Drum Width & Over, or Tractor Mounted, Towed & Light Equipment); Concrete Batch Plant, Batch Hopper; Concrete Breaker (Large, Auto, Vibratory/Sonic, Manual or Remote); Crane, Shovel, Dragline, Clamshells; Forklift (Machinery Moving or Steel Erection, 25 Ft & Over); Gradall (Cruz-Aire Type); Grader or Motor Patrol; Master Mechanic; Mechanic or Welder; Robotic Tool Carrier (With or Without Attachments); Scraper (Self Propelled or Tractor Drawn) 5 cu yds or More Capacity; Tractor or Truck Mounted Hydraulic Backhoe; Tractor or Truck Mounted Hydraulic Crane (10 Tons or Under); Tractor (Scraper, Dozer, Pusher, Loader); Trencher (Wheel Type or Chain Type Having Over 8 Inch Bucket). Future Increase(s): Add \$1.50/hr on 6/1/2015; Add \$1.60/hr on 5/30/2016.	34.47	18.70	53.17
502	Backfiller; Broom or Sweeper; Bulldozer or Endloader (Under 40 hp); Environmental Burner; Forestry Equipment, Timbco, Tree Shear, Tub Grinder, Processor; Jeep Digger; Screed (Milling Machine); Skid Rig; Straddle Carrier or Travel Lift; Stump Chipper; Trencher (Wheel Type or Chain Type Having 8 Inch Bucket & Under). Future Increase(s): Add \$1.50/hr on 6/1/2015; Add \$1.60/hr on 5/30/2016.	34.17	18.70	52.87
503	Air Compressor (&/or 400 CFM or Over); Augers (Vertical & Horizontal); Compactor (Self-Propelled 84 Ft Total Drum Width & Under, or Tractor Mounted, Towed & Light Equipment); Crusher, Screening or Wash Plant; Farm or Industrial Type Tractor; Forklift; Generator (&/or 150 KW or Over); Greaser; High Pressure Utility Locating Machine (Daylighting Machine); Mulcher; Oiler; Post Hole Digger or Driver; Pump (3 Inch or Over) or Well Points; Refrigeration Plant or Freeze Machine; Rock, Stone Breaker; Skid Steer Loader (With or Without Attachments); Vibratory Hammer or Extractor, Power Pack. Future Increase(s): Add \$1.50/hr on 6/1/2015; Add \$1.60/hr on 5/30/2016.	34.17	18.70	52.87

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
504	Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	41.65	21.71	63.36
505	Work Performed on the Great Lakes Including Crane or Backhoe Operator; Assistant Hydraulic Dredge Engineer; Hydraulic Dredge Leverman or Diver's Tender; Mechanic or Welder; 70 Ton & Over Tug Operator. Premium Increase(s): Add \$.50/hr for Friction Crane, Lattice Boom or Crane Certification (CCO).	41.65	21.71	63.36
506	Work Performed on the Great Lakes Including Deck Equipment Operator or Machineryman (Maintains Cranes Over 50 Tons or Backhoes 115,000 Lbs. or More); Tug, Launch or Loader, Dozer or Like Equipment When Operated on a Barge, Breakwater Wall, Slip, Dock or Scow, Deck Machinery.	35.72	17.85	53.57
507	Work Performed on the Great Lakes Including Deck Equipment Operator, Machineryman or Fireman (Operates 4 Units or More or Maintains Cranes 50 Tons or Under or Backhoes 115,000 Lbs. or Under); Deck Hand, Deck Engineer or Assistant Tug Operator; Off Road Trucks - Great Lakes ONLY.	35.46	20.40	55.86

**HEAVY EQUIPMENT OPERATORS
EXCLUDING SITE PREPARATION, UTILITY, PAVING LANDSCAPING WORK**

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
508	Boring Machine (Directional); Crane, Tower Crane, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons, Self-Erecting Tower Crane With a Lifting Capacity of Over 4,000 Lbs., Crane With Boom Dollies; Crane, Tower Crane, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 176 Ft or Over; Master Mechanic. Future Increase(s): Add \$1.55/hr on 6/1/2015. Premium Increase(s): Crane Operators with CCO certification add \$.50/hr. Cranes with boom length over 200 ft. not exceeding 300 ft. OR lifting capacity over 200 ton not exceeding 300 ton add \$.50/hr. Over 300 ton OR 300 ft. add \$.01/hr. per foot OR ton whichever is greater.	40.61	20.15	60.76
509	Backhoe (Track Type) Having a Mfg'r's Rated Capacity of 130,000 Lbs. or Over; Boring Machine (Horizontal or Vertical); Caisson Rig; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under, Self-Erecting Tower Crane With A Lifting Capacity Of 4,000 Lbs. & Under; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 175 Ft or Under; Pile Driver; Versi Lifts, Tri-Lifts & Gantrys (20,000 Lbs. & Over). Future Increase(s): Add \$1.55/hr on 6/1/2015. Premium Increase(s):	40.11	20.15	60.26

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
CODE	TRADE OR OCCUPATION	\$	\$	\$
	Crane Operators with CCO certification add \$.50/hr.			
510	Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs., Backhoe (Mini, 15,000 Lbs. & Under); Concrete Bump Cutter, Grinder, Planing or Grooving Machine; Concrete Laser/Screed; Concrete Paver (Slipform); Concrete Pump (Over 46 Meter), Concrete Conveyor (Rotec or Bidwell Type); Concrete Slipform Placer Curb & Gutter Machine; Concrete Spreader & Distributor; Dredge (NOT Performing Work on the Great Lakes); Forklift (Machinery Moving or Steel Erection, 25 Ft & Over); Gradall (Cruz-Aire Type); Hydro-Blaster (10,000 PSI or Over); Milling Machine; Skid Rig; Traveling Crane (Bridge Type). Future Increase(s): Add \$1.55/hr on 6/1/2015. Premium Increase(s): Crane Operators with CCO certification add \$.50/hr.	39.61	20.15	59.76
511	Air, Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Bulldozer or Endloader (Over 40 hp); Compactor (Self-Propelled 85 Ft Total Drum Width & Over, or Tractor Mounted, Towed & Light Equipment); Concrete Pump (46 Meter & Under), Concrete Conveyor (Rotec or Bidwell Type); Crane (Carry Deck, Mini) or Truck Mounted Hydraulic Crane (10 Tons or Under); Environmental Burner; Gantrys (Under 20,000 Lbs.); Grader or Motor Patrol; High Pressure Utility Locating Machine (Daylighting Machine); Manhoist; Material or Stack Hoist; Mechanic or Welder; Railroad Track Rail Leveling Machine, Tie Placer, Extractor, Tamper, Stone Leveler or Rehabilitation Equipment; Roller (Over 5 Ton); Scraper (Self Propelled or Tractor Drawn) 5 cu yd or More Capacity; Screed (Milling Machine); Sideboom; Straddle Carrier or Travel Lift; Tining or Curing Machine; Tractor (Scraper, Dozer, Pusher, Loader); Tractor or Truck Mounted Hydraulic Backhoe; Tractor or Truck Mounted Hydraulic Crane (10 Tons or Under); Trencher (Wheel Type or Chain Type Having Over 8-Inch Bucket). Future Increase(s): Add \$1.55/hr on 6/1/2015.	38.92	20.15	59.07
512	Backfiller; Broom or Sweeper; Bulldozer or Endloader (Under 40 hp); Compactor (Self-Propelled 84 Ft Total Drum Width & Under, or Tractor Mounted, Towed & Light Equipment); Concrete Batch Plant, Batch Hopper; Concrete Breaker (Large, Auto, Vibratory/Sonic, Manual or Remote); Concrete Conveyor System; Concrete Finishing Machine (Road Type); Fireman (Pile Driver & Derrick NOT Performing Work on the Great Lakes); Grout Pump; Hoist (Tugger, Automatic); Industrial Locomotives; Jeep Digger; Lift Slab Machine; Mulcher; Roller (Rubber Tire, 5 Ton or Under); Screw or Gypsum Pumps; Stabilizing or Concrete Mixer (Self-Propelled or 14S or Over); Stump Chipper; Trencher (Wheel Type or Chain Type Having 8-Inch Bucket & Under); Winches & A-Frames. Future Increase(s): Add \$1.55/hr on 6/1/2015.	37.04	20.15	57.19

Fringe Benefits Must Be Paid On <u>All</u> Hours Worked		HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
<u>CODE</u>	<u>TRADE OR OCCUPATION</u>	\$	\$	\$
513	Air Compressor (&/or 400 CFM or Over); Air, Electric or Hydraulic Jacking System; Augers (Vertical & Horizontal); Boatmen (NOT Performing Work on the Great Lakes); Boiler (Temporary Heat); Crusher, Screening or Wash Plant; Elevator; Farm or Industrial Type Tractor; Fireman (Asphalt Plant NOT Performing Work on the Great Lakes); Forklift; Generator (&/or 150 KW or Over); Greaser; Heaters (Mechanical); Loading Machine (Conveyor); Oiler; Post Hole Digger or Driver; Prestress Machine; Pump (3 Inch or Over) or Well Points; Refrigeration Plant or Freeze Machine; Robotic Tool Carrier (With or Without Attachments); Rock, Stone Breaker; Skid Steer Loader (With or Without Attachments); Vibratory Hammer or Extractor, Power Pack. Future Increase(s): Add \$1.55/hr on 6/1/2015.	31.89	20.15	52.04
514	Gas or Utility Pipeline, Except Sewer & Water (Primary Equipment). Future Increase(s): Add \$1/hr on 6/1/2015; Add \$1/hr on 5/30/2016.	36.34	22.14	58.48
515	Gas or Utility Pipeline, Except Sewer & Water (Secondary Equipment). Future Increase(s): Add \$1.65/hr on 6/1/2015.	34.06	19.35	53.41
516	Fiber Optic Cable Equipment	28.89	17.95	46.84

The documents following the Prevailing Wage Rate Determination consist of eighteen pages (including this one) of various forms/documents that will be used throughout the completion of the project. The chart below lists the form number, form/document name, the party who uses the document, and the document's number of pages. If you have any questions regarding these forms please call the Prevailing Wage Office at (608)266-6861.

ERD Form Number	Form Name	Party Who Uses the Form	Pages
	Prevailing Wage - Public Entity Project Owners	Explanation of project owner responsibilities	2
16056	Post the White Sheet	Contracting agency	1
10908	Consolidated List of Debarred Contractors	Any party contracting someone to complete work on a prevailing wage project	3
	Prevailing Wage – Contractors	Explanation of contractor responsibilities	2
7777	Disclosure of Ownership	Contractors that meet the criteria set out in (3)(A)&(B) of the form	1
5724	Prime Contractor Affidavit of Compliance	Prime contractor files with contracting agency upon completion of the work before receiving final payment	2
10584	Agent or Subcontractor Affidavit of Compliance	Subcontractors file with their awarding contractor upon completion of their work on the project before receiving final payment	2
10880	Request to Employ Subjourneyperson	Contractors wishing to employ a subjourneyperson(s)	1
	Additional General Prevailing Wage Law Information	General information for public entity or any other interested party	3

10/01/2014

PREVAILING WAGE – Public Entity Project Owners

Any public works project that has a total estimated project cost that equals or exceeds single-trade or multiple-trade project thresholds requires a prevailing wage rate determination issued by the Department of Workforce Development (DWD). Public works include erecting, constructing, remodeling, repairing, demolishing, alterations, painting and decorating projects for a local governmental unit or state agency. State law excludes minor service or maintenance work, warranty work, or work under a supply-and-installation contract. There is a statutory definition for most of these exclusions. The prevailing wage law that applies to local governmental units is §66.0903, Wis. Stats. The prevailing wage law that applies to state agencies is §103.49, Wis. Stats. The applicable administrative rules for all public entities are DWD 290 and DWD 294, Wis. Adm. Code.

Thresholds

- A “single-trade project of public works” means a project in which a single trade accounts for 85% or more of the total labor cost of the project. The single trade threshold is \$48,000.
- A “multiple-trade project of public works” means a project in which no single trade accounts for 85% or more of the total labor cost of the project.
- (a) The multiple-trade threshold is \$100,000, unless a municipality falls under the description in (b).
 - (b) The multiple-trade threshold of \$234,000 applies to public works projects erected, constructed, repaired, remodeled, or demolished by a private contractor for •a city or village with a population less than 2500 or •a town.

A local governmental unit or state agency that has a public works project that equals or exceeds the prevailing wage thresholds must do all of the following:

- Request a prevailing wage rate determination for the project from DWD at least 30 days before soliciting bids or negotiating contracts. An Application for Prevailing Wage Rate Determination is available on the DWD website: http://dwd.wisconsin.gov/er/prevailing_wage_rate/default.htm
To avoid waiting for a project determination use the on-line application system that permits the user to generate a determination immediately and save all documents in PDF form to the user’s computer. Use this project determination on line application at the following address:

- Tell potential contractors the project is subject to state prevailing wage law when soliciting bids.
- Include the prevailing wage rate determination in the construction contract, or if there is no written contract, provide a copy of the project determination to each prime contractor.
- Award contracts to contractors who do *not* appear on the "Consolidated List of Debarred Contractors."
- Notify contractors that they are required to have a written substance abuse testing program in place that fulfills the requirements of §103.503, Wis. Stats., before commencing work on the prevailing wage project.
- Post the prevailing wage rate determination on the project site. (This document is often referred to as "the white sheet.")
- Notify project contractors that if DWD finds that a contractor violated the prevailing wage law, DWD will assess liquidated damages of 100% of the wages owed to employees.
- Obtain an Affidavit of Compliance from each prime contractor before making final payment for the project.

If the total estimated cost of the project exceeds the prevailing wage thresholds, a local governmental unit or state agency also must obtain a prevailing wage rate determination under the following circumstances:

- when a completed facility is leased, purchased, lease-purchased or otherwise acquired by or dedicated to a public entity in lieu of the public entity contracting for the project,
- when one public entity does work for another public entity,
- when a *private* entity will construct a road, street, bridge, sanitary sewer or water main project and dedicate it to a local governmental unit or the state for its ownership or maintenance (except for some residential subdivisions).

For more information, visit the prevailing wage website: http://dwd.wisconsin.gov/er/prevaling_wage_rate/default.htm. For further assistance, call the Equal Rights Division at 608-266-6861 and ask for prevailing wage.

POST THE WHITE SHEET

As the public entity receiving this prevailing wage rate determination, YOU ARE REQUIRED by law to post the prevailing wage rate determination (i.e., white sheet) in at least one conspicuous and easily accessible place on the project site that is available to all construction workers. The white sheet must remain posted from the onset of the project until all construction labor on the project has been completed.

[See, Wis. Admin. Code §DWD 290.12(1)]

Posting the white sheet inside the general contractor's trailer does not meet this requirement. That placement is not available/accessible to all workers and is not a location over which you have control.

If you have questions about posting, please call (608)266-6861 and ask for prevailing wage intake.

Consolidated List of Debarred Contractors
Prepared and Issued By
State of Wisconsin - Department of Workforce Development

November 1, 2014

This list has been prepared in accordance with the provisions of §§66.0903(12) and 103.49(7), Wis. Stats., and Chapter DWD 294 of the Wisconsin Administrative Code. All contractors on this list were found to have committed a "debarable offense" related to certain labor standard provisions determined or established for a state or local public works project. No state agency, local governmental unit or owner or developer may knowingly solicit bids from, negotiate with or award any contracts to or approve or allow any subcontracts with a debarred contractor, including all divisions, affiliates or other organizational elements of such contractor that are engaged in construction business activities, until the debarment is terminated. The name of each debarred contractor must remain on this list for a period of three (3) years from the termination date indicated below. The contractor is, however, only "debarred" from the "effective date" through the "termination date" indicated for that contractor. Questions regarding this list should be addressed to Julie Eckenwalder, Equal Rights Division, P. O. Box 8928, Madison, WI 53708 or call (608) 266-3148. Deaf, hearing or speech-impaired callers may contact the department by calling its TDD number (608) 264-8752.

<u>Name of Contractor</u>	<u>Address</u>	<u>Effective Date</u>	<u>Termination Date</u>	<u>Cause Code</u>	<u>Date of Violation(s)</u>	<u>Limitations/Deviations</u>
A-1 Duran Roofing & Insulation Services, Inc.	3700 N Frattney St Milwaukee, WI 53212 or 8095 NW 64 th St Miami, FL 33166	11/1/14	10/31/17	1, 2 and 4	2011- 2012	None
Abel, Mike	See, Abel Electric, Inc					
Abel Electric, Inc	3385 Belmar Rd Green Bay, WI 54313	9/1/12	8/31/15	1	2011	None
Arnie Christiansen Mason Contractors, LLC	2304 65 th Dr Franksville, WI 53126	9/1/14	8/31/16	1, 2 and 4	2011	None
Atkins, Scott	See, Freedom Insulation, Inc					
Boecker, Roger	See, R-Way Pumping, Inc					
Brechtl, Mark G	See, Ecodec, Inc					
Cargill Heating and Air Conditioning Company, Inc	3049 Edgewater La La Crosse, WI 54603	3/1/14	2/28/17	1 and 2	2011	None
Castlerock Commercial Construction, Inc	PO Box 11699 Milwaukee, WI 53211-0699	2/1/12	1/31/15	1, 2 and 4	2009 & 2010	None

<u>Name of Contractor</u>	<u>Address</u>	<u>Effective Date</u>	<u>Termination Date</u>	<u>Cause Code</u>	<u>Date of Violation(s)</u>	<u>Limitations/ Deviations</u>
Christiansen, Andy	See, Arnie Christiansen Mason Contractors, LLC					
Christiansen, Arnold	See, Arnie Christiansen Mason Contractors, LLC					
Darnick, Gregory L	See, Darnick Trucking, LLC					
Darnick Trucking, LLC	W914 County Rd V Berlin, WI 54923	11/1/14	10/31/15	1, 2 and 4	2012 & 2013	None
Dem/Ex Group, Inc	805 S Adams St Manito, IL 61546	12/1/11	11/30/14	1 and 2	2010	None
Duran, Bernardo	See, A-1 Duran Roofing & Insulation Services and RRS2 Inc					
Ecodec, Inc	5106 Wintergreen Dr Madison, WI 53704	10/1/14	9/30/17	1	2011 & 2012	None
Fisher, Ed &/or Fisher, Rhonda	See, Dem/Ex Group, Inc					
Freedom Insulation, Inc	117925 219th Ave Chippewa Falls, WI 54729	9/1/11	8/31/14	1	2008- 2010	None
Galstad, Michael E (aka Michael Earl Galstad)	See, Cargill Heating and Air Conditioning Company, Inc					
Gjolaj, Ded	See, Horizon Bros Painting Corp					
Horizon Bros Painting Corp	1053 Kendra La Howell, MI 48843	10/1/14	9/30/16	4	2012	None
JT Roofing, Inc	350 Tower Dr Saukville, WI 53080	6/1/12	5/31/15	1, 2 and 4	2007 & 2008	None

<u>Name of Contractor</u>	<u>Address</u>	<u>Effective Date</u>	<u>Termination Date</u>	<u>Cause Code</u>	<u>Date of Violation(s)</u>	<u>Limitations/ Deviations</u>
Jinkins, Richard	See, Castlerock Commercial Construction, Inc					
Oden, Cassie	See, A-1 Duran Roofing & Insulation Services and RRS2 Inc					
Ofstie, Darin	See, Precision Excavating and Grading, LLC					
Peret, Robert	See, A-1 Duran Roofing & Insulation Services and RRS2 Inc					
Precision Excavating and Grading, LLC or Precision Excavating Enterprises, LLC	2104 Pierce Saint Croix Rd Baldwin, WI 54002	5/1/11	4/30/14	1, 2 and 4	2006- 2008	None
R-Way Pumping, Inc	3023 Lake Maria Rd Freeport, MN 56331	3/1/12	2/28/15	1, 2 and 4	2008	None
RRS2 Inc	133 N Jackson St, #427 Milwaukee, WI 53202 or 1313 N Franklin Pl, #805 Milwaukee, WI 53202	11/1/14	10/31/17	1, 2 and 4	2011- 2012	None
Thull, Gerald T	See, JT Roofing, Inc					

Cause Code: 1 = Failure to Pay Straight Time 2 = Failure to Pay Overtime 3 = Kickback 4 = Payroll Records.

PREVAILING WAGE – Contractors

Any public works project that has a total estimated project cost that equals or exceeds prevailing wage project thresholds requires a prevailing wage rate determination issued by the Department of Workforce Development (DWD). Public works include erecting, constructing, remodeling, repairing, demolishing, alterations, painting and decorating projects for a local governmental unit or state agency. State law excludes minor service or maintenance work, warranty work, or work under a supply-and-installation contract. There is a statutory definition for most of these exclusions. The prevailing wage laws that apply to local governmental units and their contractors are §§66.0903 and 103.503, Wis. Stats. The prevailing wage laws that apply to state agencies and their contractors are §§103.49 and 103.503, Wis. Stats. The applicable administrative rules for all prevailing wage projects are DWD 290 and DWD 294, Wis. Adm. Code. These laws include provisions that apply to all contractors and subcontractors working on prevailing wage projects.

Any contractor or subcontractor working on a local governmental unit or state agency's public works project that equals or exceeds current prevailing wage project thresholds must do all of the following:

- Receive and review the project's prevailing wage rate determination (i.e., white sheet).
- Tell subcontractors the project is subject to state prevailing wage law and include the prevailing wage rate determination in the construction contract, or if there is no written contract, provide a copy of the project determination to each subcontractor.
- Hire subcontractors who do *not* appear on the "Consolidated List of Debarred Contractors."
- Have a written substance abuse testing program in place that fulfills the requirements of §103.503, Wis. Stats., before commencing work on the project.

- Notify subcontractors that if DWD finds that a contractor or subcontractor violated the prevailing wage law, DWD will assess liquidated damages of 100% of the wages owed to employees.
- Apply to DWD for subjourney wage rates prior to employing these individuals on the project.
- Receive and retain a completed Affidavit of Compliance from each subcontractor brought on to the project before providing final payment to those subcontractors.
- Submit a completed Affidavit of Compliance to the contractor who brought the subcontractor on to the project before receiving final payment for the project.
- Maintain payroll records for 3 years that comply with §§66.0903(10)(a) or 103.49(5)(a), Stats. and DWD 274.06.
- Respond to requests from DWD or the project owner to provide payroll records and/or respond to prevailing wage complaints filed by employees or third parties.

For more information, visit the prevailing wage website: http://dwd.wisconsin.gov/er/prevailing_wage_rate/default.htm. For further assistance, call the Equal Rights Division at 608-266-6861 and ask for prevailing wage.

Disclosure of Ownership

The statutory authority for the use of this form is prescribed in Sections 66.0903(12)(d), 66.0904(10)(d) and 103.49(7)(d), Wisconsin Statutes.

The use of this form is mandatory. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes.

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04(1) (m), Wisconsin Statutes].

- (1) On the date a contractor submits a bid to or completes negotiations with a state agency, local governmental unit, or developer, investor or owner on a project subject to Section 66.0903, 66.0904 or 103.49, Wisconsin Statutes, the contractor shall disclose to such state agency, local governmental unit, or developer, investor or owner, the name of any "other construction business," which the contractor, or a shareholder, officer or partner of the contractor, owns or has owned within the preceding three (3) years.
- (2) The term "other construction business" means any business engaged in the erection, construction, remodeling, repairing, demolition, altering or painting and decorating of buildings, structures or facilities. It also means any business engaged in supplying mineral aggregate, or hauling excavated material or spoil as provided by Sections 66.0903(3), 66.0904(2), 103.49(2) and 103.50(2), Wisconsin Statutes.
- (3) This form must ONLY be filed, with the state agency project owner, local governmental unit project owner, or developer, investor or owner of a publicly funded private construction project that will be awarding the contract, if **both (A) and (B) are met.**
 - (A) The contractor, or a shareholder, officer or partner of the contractor:
 - (1) Owns at least a 25% interest in the "other construction business," indicated below, on the date the contractor submits a bid or completes negotiations; or
 - (2) Has owned at least a 25% interest in the "other construction business" at any time within the preceding three (3) years.
 - (B) The Wisconsin Department of Workforce Development (DWD) has determined that the "other construction business" has failed to pay the prevailing wage rate or time and one-half the required hourly basic rate of pay, for hours worked in excess of the prevailing hours of labor, to any employee at any time within the preceding three (3) years.

Other Construction Business

Business Name			
Street Address or P O Box	City	State	Zip Code
Business Name			
Street Address or P O Box	City	State	Zip Code
Business Name			
Street Address or P O Box	City	State	Zip Code
Business Name			
Street Address or P O Box	City	State	Zip Code

I hereby state under penalty of perjury that the information, contained in this document, is true and accurate according to my knowledge and belief.

Print the Name of Authorized Officer

Authorized Officer Signature

Date Signed

Corporation, Partnership or Sole Proprietorship Name

Street Address or P O Box

City

State

Zip Code

If you have any questions call (608) 266-6861

Prime Contractor Affidavit of Compliance With Prevailing Wage Rate Determination

Authorization for this form is provided under Sections 66.0903(9)(c), 66.0904(7)(c) and 103.49(4r)(c) Wisconsin Statutes.

The use of this form is mandatory. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes.

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04(1)(m), Wisconsin Statutes].

This form must **ONLY** be filed with the **Awarding Agency** indicated below.

State Of))SS County Of)	Project Name		
	DWD Determination Number		Project Number (if applicable)
	Date Determination Issued		Date of Contract
	Awarding Agency		
	Date Work Completed		

After being duly sworn, the person whose name and signature appears below hereby states under penalty of perjury that

- **I am** the duly authorized officer of the corporation, partnership, sole proprietorship or business indicated below and have recently completed all of the work required under the terms and conditions of a contract with the above-named awarding agency and make this affidavit in accordance with the requirements set forth in Section 66.0903(9)(c), 66.0904(7)(c) or 103.49(4r)(c), Wisconsin Statutes and Chapter DWD 290 of the Wisconsin Administrative Code in order to obtain FINAL PAYMENT from such awarding agency.
- **I have** fully complied with all the wage and hour requirements applicable to this project, including all of the requirements set forth in the prevailing wage rate determination indicated above which was issued for such project by the Department of Workforce Development on the date indicated above.
- **I have** received the required affidavit of compliance from each of my agents and subcontractors that performed work on this project and have listed each of their names and addresses on page 2 of this affidavit.
- **I have** full and accurate records that clearly indicate the name and trade or occupation of every worker(s) that I employed on this project, including an accurate record of the hours worked and actual wages paid to such worker(s).
- **I will** retain the records and affidavit(s) described above and make them available for inspection for a period of at least three (3) years from the completion date indicated above at the address indicated below and shall not remove such records or affidavit(s) without prior notification to the awarding agency indicated above.

Name of Corporation, Partnership, Sole Proprietorship, Business, State Agency or Local Governmental Unit					
Street Address		City	State	Zip Code	Telephone Number
Print Name of Authorized Officer				Date Signed	
Signature of Authorized Officer					

List of Agents and Subcontractors

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number			Telephone Number		

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number			Telephone Number		

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number			Telephone Number		

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number			Telephone Number		

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number			Telephone Number		

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number			Telephone Number		

If you have any questions call (608) 266-6861

Agent or Subcontractor Affidavit of Compliance With Prevailing Wage Rate Determination

Authorization for this form is provided under Sections 66.0903(9)(b), 66.0904(7)(b) and 103.49(4r)(9b), Wisconsin Statutes. The use of this form is mandatory. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes.

Personal information you provide may be used for secondary purposes [Privacy Law, Section 15.04(1)(m), Wisconsin Statutes].

This form must **ONLY** be filed with the **Awarding Contractor** indicated below.

State Of _____))SS County Of _____)	Project Name	
	DWD Determination Number	Project Number (if applicable)
	Date Determination Issued	Date of Subcontract
	Awarding Contractor	
	Date Work Completed	

After being duly sworn, the person whose name and signature appears below hereby states under penalty of perjury that

- **I am** the duly authorized officer of the corporation, partnership, sole proprietorship or business indicated below. We have recently completed all of the work required under the terms and conditions of a subcontract with the above-named awarding contractor. We make this affidavit in accordance with the requirements set forth in Section 66.0903(9)(b), 66.0904(7)(b) or 103.49(4r)(b), Wisconsin Statutes and Chapter DWD 290 of the Wisconsin Administrative Code in order to obtain FINAL PAYMENT from such awarding contractor.
- **I have** fully complied with the entire wage and hour requirements applicable to this project, including all of the requirements set forth in the prevailing wage rate determination indicated above which was issued for such project by the Department of Workforce Development on the date indicated above.
- **I have** received the required affidavit of compliance from each of my agents and subcontractors that performed work on this project and have listed each of their names and addresses on page 2 of this affidavit.
- **I have** full and accurate records that clearly indicate the name and trade or occupation of every worker(s) that I employed on this project, including an accurate record of the hours worked and actual wages paid to such worker(s).
- **I will** retain the records and affidavit(s) described above and make them available for inspection for a period of at least three (3) years from the completion date indicated above at the address indicated below and shall not remove such records or affidavit(s) without prior notification to the awarding contractor.

Name of Corporation, Partnership, Sole Proprietorship, Business, State Agency or Local Governmental Unit				
Street Address or PO Box	City	State	Zip Code	Telephone Number ()
Print Name of Authorized Officer			Date Signed	
Authorized Officer Signature				

List of Agents and Subcontractors

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ()			Telephone Number ()		

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ()			Telephone Number ()		

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ()			Telephone Number ()		

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ()			Telephone Number ()		

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ()			Telephone Number ()		

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ()			Telephone Number ()		

If you have any questions call (608) 266-6861

Request to Employ Subjourneyperson

The use of this form is mandatory. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes. Personal information you provide may be used for secondary purposes (Privacy Law, s. 15.04(1)(m), Wisconsin Statutes). The employer indicated below requests that the Department of Workforce Development (DWD) determine the prevailing wage rate(s) and related qualifications to enable such employer to use a subjourneyperson(s) on the following prevailing wage project, in accordance with the provisions of Section DWD 290.025, Wisconsin Administrative Code.

1. Name of Project Appearing on the Project Determination			
County	City, Village or Town		
DWD Project Determination Number	Project Number (if applicable)		
2. Job Classification(s) for which you request a subjourney rate (i.e., carpenter, electrician, plumber, etc.)			
a.	b.		
c.	d.		
3. Employer Name (Print)			
Address	City	State	Zip Code
Telephone Number ()			
Email address (if you prefer to receive your response via email)	Requester Title		
	Fax Number (if you prefer to receive your response via fax) ()		
READ CAREFULLY: I understand that this request is ONLY applicable to the project and job classification(s) listed above and that subjourney employees primarily work under the direction of and assist a skilled trade employee by frequently using the tools of a skilled trade and will NOT regularly perform the duties of a general laborer, heavy equipment operator or truck driver. If the subjourney employee regularly performs the work of a different trade or occupation, he/she will be compensated for such work at the applicable journeyperson prevailing wage rate. I agree to compensate subjourney employees in strict accordance with the directions received from the DWD.			
Requester Signature	Date Signed		

MAIL the completed request to:
EQUAL RIGHTS DIVISION, LABOR STANDARDS BUREAU
PO BOX 8928, MADISON WI 53708
OR
FAX the completed request to: (608) 267-4592 / **DO NOT e-mail your request.**
Call (608) 266-6861 for assistance in completing this form.

ADDITIONAL GENERAL PREVAILING WAGE LAW INFORMATION

(This document updated February 2014)

For prevailing wage laws and frequently asked questions, refer to the prevailing wage website at:
http://dwd.wisconsin.gov/er/prevailing_wage_rate/default.htm

Topic	Who's affected?	Brief description of requirement under §66.0903 or §103.49
Non-applicability	All public entities	Prevailing wage rates do not apply to minor service or maintenance work, warranty work, or work under a supply and installation contract.
Non-applicability: Minor service or maintenance work	Local governmental units & Contractors	Minor service or maintenance work means a project of public works that is limited to <ul style="list-style-type: none"> • minor crack filling, chip or slurry sealing, or other minor pavement patching, not including overlays, that has a projected life span of no longer than 5 years or that is performed for a TOWN and is not funded under §86.31, regardless of projected life span; • the depositing of gravel on an existing gravel road applied solely to maintain the road; • road shoulder maintenance; • cleaning of drainage or sewer ditches or structures; or • any other limited, minor work on public facilities or equipment that is routinely performed to prevent breakdown or deterioration.
Non-applicability: Minor service or maintenance work	State agencies	Minor service or maintenance work means a project of public works that is limited to <ul style="list-style-type: none"> • minor crack filling, chip or slurry sealing, or other minor pavement patching, not including overlays, that has a projected life span of no longer than 5 years; • cleaning of drainage or sewer ditches or structures; or • any other limited, minor work on public facilities or equipment that is routinely performed to prevent breakdown or deterioration.
Non-applicability: Supply & installation contract	All public entities	Supply and installation contract means a contract under which the material is installed by means of simple fasteners or connectors such as screws or nuts and bolts and no other work is performed on the site of the project of public works, and the total labor cost to install the material does not exceed 20 percent of the total cost of the contract.
Non-applicability: Work which a contractor or individual donates to a public entity	All public entities	Prevailing wage laws §§66.0903 & 103.49, Stats., do not apply to work performed on a project of public works for which the local governmental unit or the state or the state agency contracting for the project is not required to compensate any contractor, subcontractor, contractor's or subcontractor's agent, or individual for performing the work.

Topic	Who's affected?	Brief description of requirement under §66.0903 or §103.49
Non-applicability: Residential	All public entities	A prevailing wage rate determination is not required for the erection, construction, repair, remodeling, or demolition of a residential property containing 2 dwelling units or less.
Non-applicability: Residential subdivision infrastructure	All public entities	A prevailing wage rate determination is not required for a road, street, bridge, sanitary sewer, or water main project that is a part of a development in which at least 90 percent of the lots contain or will contain 2 dwelling units or less, as determined by the local governmental unit at the time of approval of the development, and that, on completion, is acquired by, or dedicated to, a local governmental unit (including under §236.13(2), Stats.), or the state, for ownership or maintenance by the local governmental unit or the state.
Electronic certified payroll record	Contractors	The requirement that every contractor on a prevailing wage project submit to DWD monthly a certified record of employees who worked on the project and that DWD post these certified records on its Internet website was discontinued effective July 1, 2011. Contractors are still required to maintain payroll records and provide them upon request from DWD &/or the project owner.
Payroll record inspection request by any person	Contractors & Complainants	Any person may request DWD to inspect the payroll records of any contractor working on a prevailing wage project. On receipt of such a request, the contractor must submit to DWD a certified record of its payroll records, other than personally identifiable information relating to an employee of the contractor, for no longer than a 4-week period. DWD may request records from a contractor under this provision no more than once per calendar quarter for each project of public works on which the contractor is performing work. The department may not charge a requester a fee for obtaining that information. DWD must make these certified records available for public inspection.
Statewide uniformity	Local governmental units	A local governmental unit may not enact & administer a prevailing wage ordinance/provision for public works or publicly funded private construction projects. Any extant laws to that effect are void.
Substance Abuse Testing	Contractors & Workers	Before commencing work on a prevailing wage project, a contractor must have a written substance abuse testing program in place that complies with §103.503, Wis. Stats. No employee may use, possess, attempt to possess, distribute, deliver, or be under the influence of a drug or under the influence of alcohol while performing work on a prevailing wage project.

Topic	Who's affected	Brief description of requirement under §66.0903 or §103.49
Covered employees	Truck drivers & Other workers & Contractors	<p>A laborer, worker, mechanic, or truck driver who is employed to process, manufacture, pick up, or deliver materials or products from a commercial establishment that has a fixed place of business from which the establishment supplies processed or manufactured materials or products or from a facility that is not dedicated exclusively, or nearly so, to a project of public works is NOT entitled to receive the prevailing wage rate UNLESS any of the following applies:</p> <ol style="list-style-type: none">1) the laborer, worker, mechanic, or truck driver is employed to go to the source of mineral aggregate such as sand, gravel, or stone and deliver that mineral aggregate to the site of a project of public works by depositing the material directly in final place, from the transporting vehicle or through spreaders from the transporting vehicle.2) the laborer, worker, mechanic, or truck driver is employed to go to the site of a project of public works, pick up excavated material or spoil from the site of the project, and transport that excavated material or spoil away from the site of the project.

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS

SECTION 0001 Site Improvement Items

0010	108.4400 CPM Progress Schedule	1.000 EACH	.		.	
0020	201.0105 Clearing	10.000 STA	.		.	
0030	201.0205 Grubbing	10.000 STA	.		.	
0040	204.0100 Removing Pavement ***	1,580.000 SY	.		.	
0050	204.0110 Removing Asphaltic Surface ***	28,165.000 SY	.		.	
0060	204.0150 Removing Curb & Gutter ***	1,380.000 LF	.		.	
0070	204.0155 Removing Concrete Sidewalk ***	3,865.000 SY	.		.	
0080	204.0170 Removing Fence ***	3,429.000 LF	.		.	
0090	204.0175 Removing Concrete Slope Paving	416.000 SY	.		.	
0100	204.0195 Removing Concrete Bases	12.000 EACH	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0110	204.0210 Removing Manholes	2.000 EACH	.		.	
0120	204.0220 Removing Inlets	10.000 EACH	.		.	
0130	204.0245 Removing Storm Sewer (size) 0001. 6-Inch **p**	87.000 LF	.		.	
0140	204.0245 Removing Storm Sewer (size) 0002. 8-Inch **p**	121.000 LF	.		.	
0150	204.0245 Removing Storm Sewer (size) 0003. 10-Inch **p**	97.000 LF	.		.	
0160	204.0245 Removing Storm Sewer (size) 0004. 12-Inch **p**	700.000 LF	.		.	
0170	204.0245 Removing Storm Sewer (size) 0005. 18-Inch **p**	27.000 LF	.		.	
0180	204.0245 Removing Storm Sewer (size) 0006. 24-Inch **p**	803.000 LF	.		.	
0190	204.0245 Removing Storm Sewer (size) 0007. 30-Inch **p**	238.000 LF	.		.	
0200	204.0280 Sealing Pipes	4.000 EACH	.		.	
0210	205.0100 Excavation Common	71,711.000 CY	.		.	

Wisconsin Department of Transportation

PAGE: 3

DATE: 01/29/15

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0220	213.0100 Finishing Roadway (project) 0001. 1060-34-73	1.000 EACH	.		.	
0230	305.0120 Base Aggregate Dense 1 1/4-Inch **p**	26,593.000 TON	.		.	
0240	415.0080 Concrete Pavement 8-Inch **p**	15,601.000 SY	.		.	
0250	455.0105 Asphaltic Material PG58-28	659.000 TON	.		.	
0260	455.0605 Tack Coat	4,812.000 GAL	.		.	
0270	460.1101 HMA Pavement Type E-1	11,980.000 TON	.		.	
0280	460.2000 Incentive Density HMA Pavement	7,660.000 DOL	1.00000		7660.00	
0290	520.8000 Concrete Collars for Pipe	12.000 EACH	.		.	
0300	601.0319 Concrete Curb & Gutter 19-Inch **p**	799.000 LF	.		.	
0310	601.0331 Concrete Curb & Gutter 31-Inch **p**	5,241.000 LF	.		.	
0320	601.0600 Concrete Curb Pedestrian	42.000 LF	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0330	602.0410 Concrete Sidewalk 5-Inch ***p**	5,982.000 SF	.		.	
0340	602.0515 Curb Ramp Detectable Warning Field Natural Patina	64.000 SF	.		.	
0350	608.0236 Storm Sewer Pipe Reinforced Concrete Class II 36-Inch	333.000 LF	.		.	
0360	608.0312 Storm Sewer Pipe Reinforced Concrete Class III 12-Inch	604.000 LF	.		.	
0370	608.0315 Storm Sewer Pipe Reinforced Concrete Class III 15-Inch	223.000 LF	.		.	
0380	608.0318 Storm Sewer Pipe Reinforced Concrete Class III 18-Inch	252.000 LF	.		.	
0390	608.0324 Storm Sewer Pipe Reinforced Concrete Class III 24-Inch	933.000 LF	.		.	
0400	608.0336 Storm Sewer Pipe Reinforced Concrete Class III 36-Inch	244.000 LF	.		.	
0410	608.0412 Storm Sewer Pipe Reinforced Concrete Class IV 12-Inch	619.000 LF	.		.	
0420	608.0415 Storm Sewer Pipe Reinforced Concrete Class IV 15-Inch	498.000 LF	.		.	
0430	608.0418 Storm Sewer Pipe Reinforced Concrete Class IV 18-Inch	287.000 LF	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0440	608.0436 Storm Sewer Pipe Reinforced Concrete Class IV 36-Inch	123.000 LF	.		.	
0450	611.0420 Reconstructing Manholes	1.000 EACH	.		.	
0460	611.0545 Manhole Covers Type L	8.000 EACH	.		.	
0470	611.0612 Inlet Covers Type C	15.000 EACH	.		.	
0480	611.0630 Inlet Covers Type HM-GJ	4.000 EACH	.		.	
0490	611.1004 Catch Basins 4-FT Diameter	1.000 EACH	.		.	
0500	611.1005 Catch Basins 5-FT Diameter	1.000 EACH	.		.	
0510	611.2003 Manholes 3-FT Diameter	3.000 EACH	.		.	
0520	611.2004 Manholes 4-FT Diameter	1.000 EACH	.		.	
0530	611.2005 Manholes 5-FT Diameter	18.000 EACH	.		.	
0540	611.2006 Manholes 6-FT Diameter	1.000 EACH	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0550	611.2007 Manholes 7-FT Diameter	1.000 EACH	.		.	
0560	611.3003 Inlets 3-FT Diameter	20.000 EACH	.		.	
0570	611.3004 Inlets 4-FT Diameter	14.000 EACH	.		.	
0580	612.0406 Pipe Underdrain Wrapped 6-Inch	150.000 LF	.		.	
0590	616.0206 Fence Chain Link 6-FT	2,001.000 LF	.		.	
0600	616.0329 Gates Chain Link (width) 0001. 40 Feet	4.000 EACH	.		.	
0610	616.0329 Gates Chain Link (width) 0002. 50 Feet	1.000 EACH	.		.	
0620	619.1000 Mobilization	1.000 EACH	.		.	
0630	623.0200 Dust Control Surface Treatment	63,605.000 SY	.		.	
0640	624.0100 Water	170.000 MGAL	.		.	
0650	628.1504 Silt Fence	1,946.000 LF	.		.	

Wisconsin Department of Transportation

PAGE: 7

DATE: 01/29/15

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0660	628.1520 Silt Fence Maintenance	1,946.000 LF	.		.	
0670	628.1905 Mobilizations Erosion Control	8.000 EACH	.		.	
0680	628.1910 Mobilizations Emergency Erosion Control	8.000 EACH	.		.	
0690	628.2004 Erosion Mat Class I Type B	9,421.000 SY	.		.	
0700	628.2023 Erosion Mat Class II Type B	2,178.000 SY	.		.	
0710	628.7005 Inlet Protection Type A	53.000 EACH	.		.	
0720	628.7010 Inlet Protection Type B	21.000 EACH	.		.	
0730	628.7015 Inlet Protection Type C	45.000 EACH	.		.	
0740	628.7560 Tracking Pads	4.000 EACH	.		.	
0750	629.0210 Fertilizer Type B	15.000 CWT	.		.	
0760	630.0200 Seeding Temporary	320.000 LB	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0770	632.0101 Trees (species) (size) (root) 0001. Bur Oak B&B 3-Inch Cal	18.000 EACH	.		.	
0780	632.0101 Trees (species) (size) (root) 0002. Common Hackberry B&B 3-Inch Cal	6.000 EACH	.		.	
0790	632.0101 Trees (species) (size) (root) 0003. Celebration Maple 3-Inch Cal	21.000 EACH	.		.	
0800	632.0101 Trees (species) (size) (root) 0004. Expresso Coffeetree B&B 3-Inch Cal	36.000 EACH	.		.	
0810	632.0101 Trees (species) (size) (root) 0005. London Plane Tree B&B 3-Inch Cal	12.000 EACH	.		.	
0820	632.0101 Trees (species) (size) (root) 0006. Sugar Maple B&B 3-Inch Cal	3.000 EACH	.		.	
0830	632.0101 Trees (species) (size) (root) 0007. Swamp White Oak B&B 3-Inch Cal	13.000 EACH	.		.	
0840	632.0101 Trees (species) (size) (root) 0008. Valley Forge Elm B&B 3-Inch Cal	9.000 EACH	.		.	
0850	632.0101 Trees (species) (size) (root) 0009. Adirondak Crabapple B&B 3-Inch Cal	6.000 EACH	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0860	632.0101 Trees (species) (size) (root) 0011. Corneliancherry Dogwood: Tree Form B&B 3-Inch Cal	8.000 EACH	.		.	
0870	632.0101 Trees (species) (size) (root) 0013. Robin Hill Serviceberry: Multi-Stem B&B 3-Inch Cal	26.000 EACH	.		.	
0880	632.0101 Trees (species) (size) (root) 0014. Winter King Hawthorn B&B 3-Inch Cal	14.000 EACH	.		.	
0890	632.0101 Trees (species) (size) (root) 0015. Black Hill Spruce B&B 60-Inch Ht	18.000 EACH	.		.	
0900	632.0101 Trees (species) (size) (root) 0016. Eastern Redcedar B&B 60-Inch Ht	40.000 EACH	.		.	
0910	632.0201 Shrubs (species) (size) (root) 0001. Blue Muffin Arrowwood Viburnum Cont #2	3.000 EACH	.		.	
0920	632.0201 Shrubs (species) (size) (root) 0002. Dwarf Bush-Honeysuckle Cont #2	9.000 EACH	.		.	
0930	632.0201 Shrubs (species) (size) (root) 0003. Diablo Ninebark Cont #2	4.000 EACH	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0940	632.0201 Shrubs (species) (size) (root) 0004. Glossy Black Chokeberry Cont #2	21.000 EACH	.		.	
0950	632.0201 Shrubs (species) (size) (root) 0005. Gro-Low Sumac Cont #2	65.000 EACH	.		.	
0960	632.0201 Shrubs (species) (size) (root) 0006. Indiancurrant Coralberry Cont # 2	85.000 EACH	.		.	
0970	632.0301 Vines (species) (size) (root) 0001. American Bittersweet Vine Cont # 2	43.000 EACH	.		.	
0980	632.0301 Vines (species) (size) (root) 0002. Limber Honeysuckle Cont # 2	45.000 EACH	.		.	
0990	632.9101 Landscape Planting Surveillance and Care Cycles	24.000 EACH	.		.	
1000	634.0616 Posts Wood 4x6-Inch X 16-FT	32.000 EACH	.		.	
1010	634.0816 Posts Tubular Steel 2x2-Inch X 16-FT	23.000 EACH	.		.	
1020	635.0200 Sign Supports Structural Steel HS	2,000.000 LB	.		.	
1030	636.0100 Sign Supports Concrete Masonry	3.000 CY	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
1040	636.0500 Sign Supports Steel Reinforcement	196.000 LB	.		.	
1050	637.1220 Signs Type I Reflective SH	289.000 SF	.		.	
1060	637.2210 Signs Type II Reflective H	297.640 SF	.		.	
1070	638.2102 Moving Signs Type II	4.000 EACH	.		.	
1080	638.2602 Removing Signs Type II	12.000 EACH	.		.	
1090	638.3000 Removing Small Sign Supports	9.000 EACH	.		.	
1100	646.0106 Pavement Marking Epoxy 4-Inch	12,383.000 LF	.		.	
1110	646.0126 Pavement Marking Epoxy 8-Inch	74.000 LF	.		.	
1120	647.0156 Pavement Marking Arrows Epoxy Type 1	10.000 EACH	.		.	
1130	647.0256 Pavement Marking Symbols Epoxy	15.000 EACH	.		.	
1140	647.0566 Pavement Marking Stop Line Epoxy 18-Inch	87.000 LF	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
1150	647.0726 Pavement Marking Diagonal Epoxy 12-Inch	230.000 LF	.		.	
1160	647.0766 Pavement Marking Crosswalk Epoxy 6-Inch	195.000 LF	.		.	
1170	652.0145 Conduit Rigid Metallic 4-Inch	125.000 LF	.		.	
1180	652.0225 Conduit Rigid Nonmetallic Schedule 40 2-Inch	7,513.000 LF	.		.	
1190	652.0235 Conduit Rigid Nonmetallic Schedule 40 3-Inch	230.000 LF	.		.	
1200	652.0240 Conduit Rigid Nonmetallic Schedule 40 4-Inch	920.000 LF	.		.	
1210	652.0325 Conduit Rigid Nonmetallic Schedule 80 2-Inch	710.000 LF	.		.	
1220	652.0340 Conduit Rigid Nonmetallic Schedule 80 4-Inch	86.000 LF	.		.	
1230	653.0135 Pull Boxes Steel 24x36-Inch	17.000 EACH	.		.	
1240	654.0105 Concrete Bases Type 5	25.000 EACH	.		.	
1250	654.0108 Concrete Bases Type 8	12.000 EACH	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
1260	654.0230 Concrete Control Cabinet Bases Type L30	1.000 EACH	.		.	
1270	655.0610 Electrical Wire Lighting 12 AWG	10,791.000 LF	.		.	
1280	655.0620 Electrical Wire Lighting 8 AWG	7,991.000 LF	.		.	
1290	655.0625 Electrical Wire Lighting 6 AWG	23,836.000 LF	.		.	
1300	656.0400 Electrical Service Main Lugs Only Meter Pedestal (location) 0001. N: 302250.842, E: 570148. 891	LUMP	LUMP		.	
1310	656.0400 Electrical Service Main Lugs Only Meter Pedestal (location) 0002. Salt Brine Building Room 301	LUMP	LUMP		.	
1320	657.0210 Transformer Bases Breakaway 15-17 Inch Bolt Circle	12.000 EACH	.		.	
1330	657.0255 Transformer Bases Breakaway 11 1/2-Inch Bolt Circle	25.000 EACH	.		.	
1340	657.0322 Poles Type 5-Aluminum	25.000 EACH	.		.	
1350	657.0375 Poles Type A	12.000 EACH	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
1360	657.0610 Luminaire Arms Single Member 4 1/2-Inch Clamp 6-FT	35.000 EACH	.		.	
1370	657.0620 Luminaire Arms Single Member 6-Inch Clamp 4-FT	13.000 EACH	.		.	
1380	659.0802 Plaques Sequence Identification	49.000 EACH	.		.	
1390	659.1120 Luminaires Utility LED B	35.000 EACH	.		.	
1400	659.1130 Luminaires Utility LED D	13.000 EACH	.		.	
1410	659.2230 Lighting Control Cabinets 240/480 30-Inch	1.000 EACH	.		.	
1420	690.0150 Sawing Asphalt	716.000 LF	.		.	
1430	690.0250 Sawing Concrete	198.000 LF	.		.	
1440	715.0415 Incentive Strength Concrete Pavement	1,038.000 DOL	1.00000		1038.00	
1450	SPV.0035 Special 0100. Ebs Excavation	200.000 CY	.		.	
1460	SPV.0035 Special 0101. Ebs Backfill	200.000 CY	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
1470	SPV.0060 Special 0001. Inlet Covers Type 57	27.000 EACH	.		.	
1480	SPV.0060 Special 0002. Inlet Covers Type R Special	8.000 EACH	.		.	
1490	SPV.0060 Special 0004. Removing Sanitary Manholes	2.000 EACH	.		.	
1500	SPV.0060 Special 0005. Reconstructing Sanitary Manholes	4.000 EACH	.		.	
1510	SPV.0060 Special 0006. Adjusting Sanitary Manholes	2.000 EACH	.		.	
1520	SPV.0060 Special 0007. Connecting Sanitary Lateral 6-Inch	1.000 EACH	.		.	
1530	SPV.0060 Special 0010. Removing Existing Foundation	24.000 EACH	.		.	
1540	SPV.0060 Special 0011. Installing County Furnished Keypad	3.000 EACH	.		.	
1550	SPV.0060 Special 0019. Parking Lot Bollard	110.000 EACH	.		.	
1560	SPV.0060 Special 0020. Mayfair Pond Outlet Storm Sewer Structure Reconstruction	1.000 EACH	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
1570	SPV.0060 Special 0021. Removing And Stockpiling Light Poles, Arms & Luminaires	12.000 EACH	.		.	
1580	SPV.0060 Special 0101. Conveyor	1.000 EACH	.		.	
1590	SPV.0060 Special 0102. Installing State Furnished Bike Rack	4.000 EACH	.		.	
1600	SPV.0060 Special 7001. Gabion Pillars	19.000 EACH	.		.	
1610	SPV.0060 Special 7101. Hydrant Assembly	2.000 EACH	.		.	
1620	SPV.0060 Special 7102. Butterfly Valve, 12-Inch	1.000 EACH	.		.	
1630	SPV.0060 Special 7103. Resilient Wedge Gate Valve 8-Inch	1.000 EACH	.		.	
1640	SPV.0060 Special 7104. Resilient Wedge Gate Valve 6-Inch	1.000 EACH	.		.	
1650	SPV.0060 Special 7105. Cut And Cap Water Main	4.000 EACH	.		.	
1660	SPV.0060 Special 7106. Removing Hydrant	1.000 EACH	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
1670	SPV.0060 Special 7107. Hydrant Assembly Relocation	2.000 EACH	.		.	
1680	SPV.0060 Special 7108. Air Release Valve 2-Inch	1.000 EACH	.		.	
1690	SPV.0060 Special 7109. Abandon Valve Boxes	1.000 EACH	.		.	
1700	SPV.0060 Special 7110. Adjusting Valve Boxes	11.000 EACH	.		.	
1710	SPV.0060 Special 7111. Adjusting Hydrant	1.000 EACH	.		.	
1720	SPV.0060 Special 7112. Removing Water Valve	2.000 EACH	.		.	
1730	SPV.0085 Special 7001. No Mow Fescue Grass Seed	800.000 LB	.		.	
1740	SPV.0090 Special 0001. Concrete Curb & Gutter 6-Inch Sloped 31-Inch	1,384.000 LF	.		.	
1750	SPV.0090 Special 0002. Removing Sanitary Sewer	230.000 LF	.		.	
1760	SPV.0090 Special 0009. Storm Sewer Corrugated High Density Polyethylene (Hdpe) 12-Inch	366.000 LF	.		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
1770	SPV.0090 Special 0011. Storm Sewer Pvc Sdr 35 6-Inch	357.000 LF	.		.	
1780	SPV.0090 Special 0012. Storm Sewer Pvc Sdr 35 8-Inch	347.000 LF	.		.	
1790	SPV.0090 Special 0013. Storm Sewer Pvc Sdr 35 10-Inch	276.000 LF	.		.	
1800	SPV.0090 Special 1035. Electrical Wiring Lighting 500 Kcmil	3,792.000 LF	.		.	
1810	SPV.0090 Special 7001. Poly Edging Material	1,285.000 LF	.		.	
1820	SPV.0090 Special 7002. Decorative Steel Fence	181.000 LF	.		.	
1830	SPV.0090 Special 7003. Green Screen Fence	352.000 LF	.		.	
1840	SPV.0090 Special 7101. Ductile Iron (Di) Class 55 Water Main 12-Inch	479.000 LF	.		.	
1850	SPV.0090 Special 7102. Ductile Iron (Di) Class 55 Water Main 8-Inch	185.000 LF	.		.	
1860	SPV.0090 Special 7103. Copper Water Service 2-Inch	214.000 LF	.		.	
1870	SPV.0105 Special 0001. Survey Project 1060-34-73	LUMP	LUMP		.	

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
1880	SPV.0105 Special 0002. Pavement Cleanup Project 1060-34-73	LUMP	LUMP			.
1890	SPV.0105 Special 0003. Moving Salt	LUMP	LUMP			.
1900	SPV.0105 Special 0004. Moving State-Owned Materials	LUMP	LUMP			.
1910	SPV.0105 Special 0005. Static Scale System	LUMP	LUMP			.
1920	SPV.0105 Special 0006. Removing Former Sheriffs Building Structure	LUMP	LUMP			.
1930	SPV.0105 Special 0101. Salt Dome	LUMP	LUMP			.
1940	SPV.0105 Special 0102. Storage Building 1	LUMP	LUMP			.
1950	SPV.0105 Special 0103. Storage Building 2	LUMP	LUMP			.
1960	SPV.0105 Special 0104. Salt Brine Building	LUMP	LUMP			.
1970	SPV.0105 Special 0105. Bins	LUMP	LUMP			.
1980	SPV.0105 Special 0106. Dewatering Catch Basin	LUMP	LUMP			.

SCHEDULE OF ITEMS

REVISED:

CONTRACT:
20150310014PROJECT(S):
1060-34-73FEDERAL ID(S):
N/A

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
1990	SPV.0105 Special 1025. Common Electrical Work Storage Building 1	LUMP	LUMP		.	
2000	SPV.0105 Special 1026. Common Electrical Work Storage Building 2	LUMP	LUMP		.	
2010	SPV.0105 Special 1027. Common Electrical Work Salt Brine Building	LUMP	LUMP		.	
2020	SPV.0180 Special 0001. Insulation Board Polystyrene, 4-Inch	515.000 SY	.		.	
2030	SPV.0180 Special 0007. Topsoil Special	23,500.000 SY	.		.	
2040	SPV.0195 Special 0001. Management Of Solid Waste	5,690.000 TON	.		.	
2050	SPV.0195 Special 7001. River Stone	40.000 TON	.		.	
	SECTION 0001 TOTAL				.	
	TOTAL BID				.	

PLEASE ATTACH SCHEDULE OF ITEMS HERE