RFB NO. 310033

CONSTRUCTION DOCUMENTS
PROJECT MANUAL

DANE COUNTY DEPARTMENT OF PUBLIC WORKS,
HIGHWAY AND TRANSPORTATION

PUBLIC WORKS ENGINEERING DIVISION
1919 ALLIANT ENERGY CENTER WAY
MADISON, WISCONSIN 53713

REQUEST FOR BIDS NO. 310033
DOMESTIC HOT WATER SYSTEM REPLACEMENT WITH HEAT RECOVERY
CITY COUNTY BUILDING
210 MARTIN LUTHER KING JR BLVD
MADISON, WISCONSIN

Opening Date / Time: **THURSDAY, NOVEMBER 18, 2010 @ 2:00 P.M.** Location: **PUBLIC WORKS OFFICE**

Performance / Payment Bond: **100% OF CONTRACT AMOUNT** Bid Deposit: **5% OF BID AMOUNT**

FOR INFORMATION ON THIS REQUEST FOR BIDS, PLEASE CONTACT:

JOHN SCHRAUFNAGEL, PROJECT ENGINEER
DANE COUNTY DEPARTMENT OF PUBLIC WORKS,
HIGHWAY & TRANSPORTATION
1919 ALLIANT ENERGY CENTER WAY
MADISON, WISCONSIN 53713
TELEPHONE NO.: 608/266-4798
FAX NO.: 608/267-1533
E-MAIL: SCHRAUFNAGEL@CO.DANE.WI.US

DOCUMENT INDEX FOR RFB NO. 310033

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DRAWINGS

To be printed to correct scale or size, plot sheets on (C), 24” x 36” paper.

Sheet No. T100 - Title Sheet
Sheet No. P101 – Mechanical Room Floor Plan – Existing Conditions and Phase 1 Demolition
Sheet No. P102 – Mechanical Room Floor Plan – Phase 2 New Work and Phase 3 Demolition
Sheet No. P103 – Mechanical Room Floor Plan – Phase 4 New Work and Existing Condition Diagram
Sheet No. P104 – Plumbing Piping Diagrams
Sheet No. P105 – Plumbing Piping Diagrams
Sheet No. M101 –Mechanical Room Floor Plans and Details
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LEGAL NOTICE

INVITATION TO BID

Dane County Public Works, Highway & Transportation Dept., 1919 Alliant Energy Center Way, Madison, WI 53713, will receive sealed Bids until:

2:00 P.M., THURSDAY, NOVEMBER 18, 2010

REQUEST FOR BIDS NO. 310033

DOMESTIC HOT WATER SYSTEM REPLACEMENT WITH HEAT RECOVERY

CITY-COUNTY BUILDING
210 MARTIN LUTHER KING, JR. BLVD.
MADISON, WISCONSIN

Dane County is inviting Bids to replace the domestic hot water system with a new domestic hot water system including a heat recovery system in the City-County Building.

Request for Bids package may be obtained at Dane County Public Works, Highway & Transportation Dept., 1919 Alliant Energy Center Way, Madison, WI 53713, by calling 608-266-4018, or downloading it from www.danepurchasing.com/rfps.aspx. Please call John Schraufnagel, Project Engineer, at 608-266-4798, for any questions or additional information.

All Bidders must be a registered vendor with Dane County & pay an annual registration fee & may be required to be pre-qualified as a Best Value Contractor before award of Contract. Complete Vendor Registration Form at www.danepurchasing.com or obtain one by calling 608-266-4131. Complete Pre-qualification Application for Contractors at: http://www.countyofdane.com/pwht/BVC_Application.aspx or obtain one by calling 608-266-4018.

Bidders facility tour will be held on Tuesday, November 9, 2010 at 9:00 A.M. at the City-County Building, starting in the First Floor lobby. Bidders are not required to attend this tour in order to bid on the Work.

PUBLISH: **NOVEMBER 2 & 9, 2010 - WISCONSIN STATE JOURNAL**
NOVEMBER 2 & 9, 2010 - THE DAILY REPORTER

INSTRUCTIONS TO BIDDERS

TABLE OF CONTENTS

1. GENERAL

A. Before submitting Bid, bidder shall thoroughly examine all Construction Documents. Successful Bidder shall be required to provide all the Work that is shown on Drawings, set forth in Specifications, or reasonably implied as necessary to complete Contract for this project.

B. Bidder shall visit site to become acquainted with adjacent areas, means of approach to site, conditions of actual site and facilities for delivering, storing, placing, and handling of materials and equipment.

C. Pre-bid meeting is scheduled on November 9, 2010 at 9:00 AM at City County Building, 210 Martin Luther King Jr. Blvd, Madison, WI, in the First Floor Lobby. Attendance by all bidders is optional, however bidders and subcontractors are strongly encouraged to attend.

D. Failure to visit site or failure to examine any and all Construction Documents will in no way relieve successful Bidder from necessity of furnishing any necessary materials or equipment, or performing any work, that may be required to complete the Work in accordance with Drawings and Specifications. Neglect of above requirements will not be accepted as reason for delay in the Work or additional compensation.

2. DRAWINGS AND SPECIFICATIONS

A. Drawings and Specifications that form part of this Contract, as stated in Article 1 of General Conditions of Contact, are enumerated in Document Index of these Construction Documents.

B. Complete sets of Drawings and Specifications for all trades will be issued to all Bidders, irrespective of category of work to be bid on, in order that all Bidders may be familiar with work of other trades as they affect their bid.

3. INTERPRETATION

A. No verbal explanation or instructions will be given in regard to meaning of Drawings or Specifications before Bid Opening. Bidders shall bring inadequacies, omissions or conflicts to Owner or Architect / Engineer's attention at least ten (10) days before Bid Opening. Prompt clarification will be available to all bidders by Addendum.

B. Failure to so request clarification or interpretation of Drawings and Specifications will not relieve successful Bidder of responsibility. Signing of Contract will be considered as implicitly denoting that Contractor has thorough understanding of scope of the Work and comprehension of Construction Documents.

C. Owner or Engineer will not be responsible for verbal instructions.

4. QUALIFICATIONS OF BIDDER (CONTRACTOR AND SUBCONTRACTOR)

A. Before award of Contract can be approved, Owner shall be satisfied that Bidder involved meets following requirements:
   1. Has completed at least one (1) project of at least fifty percent (50%) of size or value of Division of work being bid and type of work completed is similar to that being bid. If greater magnitude of experience is deemed necessary, other than size or value of work, such requirements will be described in appropriate section of Specifications.

   2. Maintains permanent place of business.

   3. Can be bonded for terms of proposed Contract.

   4. Has record of satisfactorily completing past projects and supplies list of five (5) most recent, similar projects, with architect or engineer's and owner's names, addresses and telephone numbers for each project. Submit to Public Works Project Engineer within three (3) days after Bid Opening. Criteria which will be considered in determining satisfactory completion of projects by bidder will include:
      a) Completed contracts in accordance with drawings and specifications.
      b) Diligently pursued execution of work and completed contracts according to established time schedule unless Owner grants extensions.
      c) Fulfilled guarantee requirements of construction documents.
      d) Is not presently on ineligible list maintained by County's Department of Administration for noncompliance with equal employment opportunities and affirmative action requirements.
      e) Authorized to conduct business in Wisconsin. By submitting Bid, bidder warrants that it has: complied with all necessary requirements to do business in State of Wisconsin; that persons executing contract on its behalf are authorized to do so; and, if corporation, that name and address of bidder's registered agent are as set forth in

Contract. Bidder shall notify Owner immediately, in writing, of any change in its registered agent, their address, and bidder's legal status. For partnership, term "registered agent" shall mean general partner.

B. County's Public Works Project Engineer will make such investigations as are deemed necessary to determine ability of bidder to perform the Work, and bidder shall furnish to County's Public Works Project Engineer or designee all such information and data for this purpose as County's Public Works Project Engineer may request. Owner reserves right to reject Bid if evidence submitted by, or investigation of, bidder fails to satisfy Owner that bidder is responsible and qualified to carry out obligations of Contract and to complete the Work contemplated therein.

5. BID GUARANTEE

A. Bank certified check, cashier's check or Bid Bond, payable to County in amount not less than five percent (5%) of maximum bid, shall accompany each Bid as guarantee that if Bid is accepted, Bidder will execute and return proposed Contract and Performance and Payment Bonds within ten (10) days after being notified of acceptance of Bid. Company issuing bonds must be licensed to do business in Wisconsin.

B. Any bid, which is not accompanied by bid guarantee, will be considered "No Bid" and will not be read at Bid Opening.

C. If successful Bidder so delivers Contract, Certificate of Insurance, and Performance and Payment Bonds, check will be returned to Bidder. In case Bidder fails to deliver such Contract, insurance, and bond, amount of bid guarantee will be forfeited to County as liquidated damages.

D. All checks tendered as bid guarantee, except those of three lowest qualified, responsible bidders, will be returned to their makers within three (3) days after Bid Opening. All such retained checks will be returned immediately upon signing of Contract and Performance and Payment Bonds by successful Bidder.

6. WITHDRAWAL OF BIDS

A. Bids may be withdrawn by written request received from bidder or authorized representative thereof prior to time fixed for Bid Opening, without prejudice to right of bidder to file new Bid. Withdrawn Bids will be returned unopened. Negligence on part of bidder in preparing their Bid confers no right for withdrawal of Bid after it has been opened.

B. No Bid may be withdrawn for period of 120 days after Bid Opening date.

C. If Bid contains error, omission or mistake, bidder may limit liability to amount of bidder's guarantee by giving written Notice of Intent not to execute Contract to Owner within seventy-two (72) hours of Bid Opening.

7. CONTRACT FORM

A. Sample copy of contract that successful Bidder will be required to enter into is included in these Construction Documents and bidders are required to familiarize themselves with all conditions contained therein.

8. CONTRACT INTERESTS BY COUNTY PUBLIC OFFICIALS

A. In accordance with Wisconsin Statute 946.13, county official may not bid for or enter into any contract involving receipts or disbursements of more than $7,500.00 in a year, in which they have private pecuniary interest, direct or indirect if at same time they are authorized to take official action with respect to making of this Contract. Any contract entered into in violation of this Statute is void and County incurs no liability thereon. This subsection does not affect application and enforcement of Wisconsin Statute 946.13 by state prosecutors in criminal courts of this state.

9. EMERGING SMALL BUSINESS PROVISIONS

A. **Emerging Small Business Definition.** For purposes of this provision, ESB is defined as:
   1. Independent business concern that has been in business minimum of one year;
   2. Business located in State of Wisconsin;
   3. Business comprised of less than 25 employees;
   4. Business must not have gross sales in excess of three million dollars ($3,000,000.00) over past three years; and
   5. Business does not have history of failing to complete projects.

B. **Emerging Small Business (ESB) Involvement.** Bidder shall make good faith effort to award minimum of ten percent (10%) of the Work to ESBs. Bidder shall submit report to Dane County Contract Compliance Officer within twenty-four (24) hours after Bid Opening demonstrating such efforts. Good faith efforts means significant contact with ESBs for purposes of soliciting bids from them. Failure to make or demonstrate good faith efforts will be grounds for disqualification.

C. **Emerging Small Business Report.** Emerging Small Business Enterprise Report is to be submitted by Bidder in separate envelope marked “Emerging Small Business Report”. This report is due by 2:00 p.m. following specified twenty-four (24) hours after Bid Opening. Bidder who fails to submit Emerging Small Business Report shall be deemed not responsive.

D. **ESB Goal.** Ten percent (10%) ESB participation is goal of this project. ESB utilizations are shown as percentage of total Bid. If Bidder meets or exceeds specified goal, Bidder is only required to submit Form A - Certification, and Form B - Involvement. Goal shall be met if Bidder qualifies as ESB.

E. **Report Contents.** Following award of Contract, Bidder shall submit copies of executed contracts for all Emerging Small Businesses. Emerging Small Business Report shall consist of these:
   1. Form A - Certification;
   2. Form B - Involvement;

3. Form C - Contacts;

4. Form D - Certification Statement (if appropriate); and

5. Supportive documentation (i.e., copies of correspondence, telephone logs, copies of advertisements).

F. **ESB Listing.** Bidders will solicit bids from ESB listing provided by Dane County.

G. **ESB Certification.** All contractors, subcontractors and suppliers seeking ESB certification must complete and submit Emerging Small Business Certification Application to Dane County Contract Compliance Program.

H. **Certification Statement.** If ESB firm has not been certified by County as ESB prior to submittal of this Bid, ESB Report cannot be used to fulfill ESB goal for this project unless firm provides "Form D - Certification Statement". Certification statement must be completed and signed by ESB firm.

I. **Questions.** Questions concerning Emerging Small Business provisions shall be directed to:
Dane County Contract Compliance Officer
City-County Building, Room 421
210 Martin Luther King, Jr. Blvd.
Madison, WI 53703
608/266-5623

J. **Substituting ESBs.** In event of any significant changes in subcontract arrangements or if need arises to substitute ESBs, Bidder shall report such proposed changes to Contract Compliance Officer to making any official changes and request authorization to substitute ESB firm. Bidder further agrees to make every possible effort to replace ESB firm with another qualified ESB firm.

K. **Good Faith Efforts.** Good faith efforts can be demonstrated by meeting all of these obligations:

1. Selecting portions of the Work to be performed by ESBs in order to increase likelihood of meeting ESB goal including, where appropriate, breaking down Contract into smaller units to facilitate ESB participation.

2. Advertising in general circulation, trade associations, and women / minority focus media concerning subcontracting opportunities.

3. Providing written notices to reasonable number of specific ESBs that their interest in Contract was being solicited in sufficient time to allow ESBs to participate effectively.

4. Following up on initial solicitations of interest by contacting ESBs within five (5) working days prior to Bid Opening date to determine with certainty whether ESB were interested, to allow ESBs to prepare bids.

5. Providing interested ESB with adequate information about Drawings, Specifications and requirements of Contract.

6. Using services of available minority, women and small business organizations and other organizations that provide assistance in recruitment of MBEs / WBEs / ESBs.

7. Negotiating in good faith with interested ESBs, not rejecting ESBs as unqualified without sound reason based on thorough investigation of their capabilities.

8. Submitting required project reports and accompanying documents to County's Contract Compliance Officer within twenty-four (24) hours after Bid Opening.

L. **Appeals Disqualification of Bid.** Bidder who is disqualified may appeal to Public Works & Transportation Committee and Equal Opportunity Commission.

10. METHOD OF AWARD - RESERVATIONS

A. Following will be basis of award of Contract, providing cost does not exceed amount of funds then estimated by County as available to finance Contract(s):
   1. Lowest dollar amount submitted by qualified responsible bidder on Base Bid for all work comprising project, combined with such additive Owner accepted alternates.

   2. Owner reserves right to reject all bids or any bid, to waive any informality in any bid, and to accept any bid that will best serve interests of County.

   3. Unit Prices and Informational Bids will not be considered in establishing low bidder.

11. SECURITY FOR PERFORMANCE AND PAYMENTS

A. Simultaneous with delivery of signed Contract, Bidder shall be required to furnish Performance and Payment Bonds as specified in Article 29 of General Conditions of Contract, "Contract Security". Surety Company shall be licensed to do business in Wisconsin. Performance and Payment Bonds must be dated same date or subsequent to date of Contract. Performance and Payment Bonds must emulate information in Sample Performance and Payment Bonds in Construction Documents.

B. Provide certified copy of power of attorney from Surety Company showing that agent who signs Bond has power of attorney to sign for Surety Company. Secretary or Assistant Secretary of company must sign this certification, not attorney-in-fact. Certification must bear same or later date as Bond. Power of Attorney must emulate model power of attorney information detailed in Sample Performance and Payment Bonds.

C. If Bidder is partnership or joint venture, State certified list, providing names of individuals constituting partnership or joint venture must be furnished. Contract itself may be signed by one partner of partnership, or one partner of each firm comprising joint venture, but Performance and Payment Bonds must be signed by all partners.

D. If Bidder is a corporation, it is necessary that current certified copy of resolution or other official act of directors of corporation be submitted showing that person who signs Contract is authorized to sign contracts for corporation. It is also necessary that corporate seal be affixed to resolution, contract, and performance and payment bonds. If your corporation has no seal, it is required that above documents include statement or notation to effect that corporation has no seal.

12. TAXES

A. Bidder shall include in Bid, all Sales, Consumer, Use and other similar taxes required by law.

B. In accordance with Wisconsin Statute 71.80(16)(a),successful nonresident bidder, whether incorporated or not, and not otherwise regularly engaged in business in this state, shall file surety bond with State of Wisconsin Department of Revenue payable to Department of Revenue, to guarantee payment of income taxes, required unemployment compensation contributions, sales and use taxes and income taxes withheld from wages of employees, together with any penalties and interest thereon. Amount of bond shall be three percent (3%) of Contract or subcontract price on all contracts of $50,000 or more.

13. SUBMISSION OF BIDS

A. All Bids shall be submitted on standard Bid Form bound herein and only Bids that are made on this Bid Form will be considered. Entire Bid Form and other supporting documents, if any, shall be removed or copied from Construction Documents, filled out, and submitted in manner specified hereinafter. Submit completed Bid Bond with Bid as well.

B. No bids for any subdivision or any sub-classification of this Work, except as indicated, will be accepted. Any conditional Bid, amendment to Bid Form or appended item thereto, or inclusion of any correspondence, written or printed matter, or details of any nature other than that specifically called for, which would alter any essential provision of Construction Documents, or require consideration of unsolicited material or data in determining award of Contract, will disqualify Bid. Telecommunication alterations to Bid will not be accepted.

C. Bidders must submit single Bid for all the Work.

D. Bid amounts shall be inserted in words and in figures in spaces provided on Bid Form; in case of conflict, written word amounts will govern.

E. Addenda issued after Bid Letting shall become part of Construction Documents. Bidders shall acknowledge receipt of such addenda in appropriate space provided on Bid Form. Bid will be rejected if receipt of any particular addendum applicable to award of Contract has not been acknowledged on Bid Form.

F. Bids shall be signed, placed in envelope, sealed and delivered before time of closing to place designated in Invitation to Bid, and identified with project name, bid number, location, category of work being bid upon, Bid Opening date, name and address of bidder.

G. Bidder shall be responsible for sealed Bid being delivered to place designated for Bid Opening on or before date and time specified. Bids received after time of closing will be rejected and returned to bidder unopened.

H. Bid will be considered invalid and will be rejected if bidder has not signed it.

I. Faxed Bids will not be accepted.

J. Bidder’s organization shall submit completed with Bid, Fair Labor Practices Certification form, included in these Construction Documents.

14. SUBCONTRACTOR LISTING

A. Bidders shall be required to submit list of major subcontractors for General Construction, Plumbing, HVAC, and Electrical work proposed for this project to include committed prices for each subcontractor. List shall be placed in separate sealed envelope that must be clearly

identified as “Major Subcontractor List”, for named project and name of Bidder submitting it. County must receive envelope no later than date by which successful Bidder is required to submit his or her signed Contract, as established in Construction Documents.

15. ALTERNATE BIDS

A. None

16. INFORMATIONAL BIDS

A. Bidder shall state amount that is included in Base Bid for all equipment, materials and labor required to complete the Work described. Informational bids are amounts requested for accounting purposes and for allocation of funds only. It is not intended to omit any of the Work described or related items from this project.

B. Description of requested Informational Bids, if any, is as set forth in Construction Documents.

17. UNIT PRICES

A. None

18. COMMENCEMENT AND COMPLETION

A. Successful Bidder shall commence work when schedule and weather permit, but no later than stated in Bid Form. Contractor shall pursue the Work regularly and continuously at reasonable rate to insure completion of the Work within time stated in Bid.

B. Should it be found impossible to complete the Work on or before time specified for completion, written request may be submitted for extension of time setting forth reasons believed to justify granting of such request. Refer to [Article 20 of General Conditions of Contract, titled “Time for Completion.”

19. WORK BY OWNER

A. This work will be accomplished by Owner or will be let under separate contracts and will not be included under this Contract:

1. Asbestos Abatement

2. Inspection and testing of materials if not specified.

FORM A

DANE COUNTY
EMERGING SMALL BUSINESS REPORT - CERTIFICATION

In accordance with General Conditions of Contract, submit this Emerging Small Business Report within 24 hours after Bid Opening.

PROJECT NAME: _____

_____

BID NO.: _____ BID OPENING DATE: _____

BIDDER INFORMATION

COMPANY NAME: _____

ADDRESS: _____

_____

TELEPHONE NO.: _____

CONTACT PERSON: _____

FORM B

DANE COUNTY
EMERGING SMALL BUSINESS REPORT - INVOLVEMENT

Page ___ of ___
(Copy this Form as necessary to provide complete information)

COMPANY NAME: ____

PROJECT NAME: ______________________________ BID NO.: ______________

ESB NAME: ______________________ CONTACT PERSON: ______________________

ADDRESS: ______________________________ PHONE NO.: ______________

CITY: ______________________ STATE: ________ ZIP: __________

Indicate percentage of financial commitment to this ESB: ____________% Amount: $____________

ESB NAME: ______________________ CONTACT PERSON: ______________________

ADDRESS: ______________________________ PHONE NO.: ______________

CITY: ______________________ STATE: ________ ZIP: __________

Indicate percentage of financial commitment to this ESB: ____________% Amount: $____________

ESB NAME: ______________________ CONTACT PERSON: ______________________

ADDRESS: ______________________________ PHONE NO.: ______________

CITY: ______________________ STATE: ________ ZIP: __________

Indicate percentage of financial commitment to this ESB: ____________% Amount: $____________

FORM C

DANE COUNTY
EMERGING SMALL BUSINESS REPORT - CONTACTS

(Copy this Form as necessary to provide complete information)

COMPANY NAME: _____

PROJECT NAME: _____ BID NO.: _____

	ESB FIRM NAME CONTACTED	DATE	PERSON CONTACTED	DID ESB BID?	DID YOU ACCEPT BID?	REASON FOR REJECTION
1)						
2)						
3)						
4)						
5)						
6)						
7)						

FORM D

DANE COUNTY
EMERGING SMALL BUSINESS REPORT - CERTIFICATION STATEMENT

I, _____ , _____ of
Name Title

_____ certify to best of my knowledge and
Company

belief that this business meets Emerging Small Business definition as indicated in Article 9 and that information contained in this Emerging Small Business Report is true and correct.

_____ _____
Bidder's Signature Date

BID FORM

BID NO. 310033

PROJECT: **DOMESTIC HOT WATER SYSTEM REPLACEMENT WITH HEAT RECOVERY**
CITY COUNTY BUILDING
210 MARTIN LUTHER KING JR. BLVD.
MADISON, WISCONSIN

TO: **DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HIGHWAY & TRANSPORTATION PROJECT ENGINEER**
1919 ALLIANT ENERGY CENTER WAY
MADISON, WISCONSIN 53713

BASE BID - LUMP SUM:
Dane County is inviting Bids for construction services to replace the domestic hot water system with a heat recovery system in the City County Building. The undersigned, having examined the site where the Work is to be executed and having become familiar with local conditions affecting the cost of the Work and having carefully examined the Drawings and Specifications, all other Construction Documents and Addenda thereto prepared by Dane County Department of Public Works, Highway & Transportation hereby agrees to provide all labor, materials, equipment and services necessary for the complete and satisfactory execution of the entire Work, as specified in the Construction Documents, for the Base Bid stipulated sum of:

_____ and _____ /100 Dollars
Written Price

$_____
Numeric Price

Receipt of the following addenda and inclusion of their provisions in this Bid is hereby acknowledged:

Addendum No(s). _____ through _____

Dated _____

Dane County must have this project completed by April 1,2011. Assuming this Work can be started by February 1, 2011, what dates can you commence and complete this job?

Commencement Date: _____ Completion Date: _____
(final, not substantial)

I hereby certify that all statements herein are made on behalf of:

_____

(Name of Corporation, Partnership or Person submitting Bid)

Select one of the following:

1. A corporation organized and existing under the laws of the State of _____, or

2. A partnership consisting of _____, or

3. A person conducting business as _____;

Of the City, Village, or Town of _____ of the State of _____.

I have examined and carefully prepared this Bid from the associated Construction Documents and have checked the same in detail before submitting this Bid; that I have full authority to make such statements and submit this Bid in (its) (their) (my) behalf; and that the said statements are true and correct. In signing this Bid, we also certify that we have not, either directly or indirectly, entered into any agreement or participated in any collusion or otherwise taken any action in restraint of free competition; that no attempt has been made to induce any other person or firm to submit or not to submit a Bid; that this Bid has been independently arrived at without collusion with any other bidder, competitor, or potential competitor; that this Bid has not been knowingly disclosed prior to the opening of Bids to another bidder or competitor; that the above statement is accurate under penalty of perjury.

SIGNATURE: _____

(Bid is invalid without signature)

Print Name: _____ Date: _____

Title: _____

Address: _____

Telephone No.: _____ Fax No.: _____

Email Address: _____

Contact Person: _____

BID CHECK LIST:
These items **must** be included with Bid:

☐ Bid Form	☐ Bid Bond	☐ Fair Labor Practices Certification

THE FOLLOWING IS FOR BIDDERS' REFERENCE AND ARE REQUIRED BUT NEED NOT BE SUBMITTED WITH BID FORM:

DANE COUNTY VENDOR REGISTRATION PROGRAM

Any person bidding on any County contract must be registered with the Dane County Purchasing Division & pay an annual registration fee. A contract will not be awarded to an unregistered vendor. Obtain a *Vendor Registration Form* by calling 608/266-4131 or complete a new form or renewal one online at:

www.danepurchasing.com/registration

DANE COUNTY BEST VALUE CONTRACTING PRE-QUALIFICATION

Contractors must be pre-qualified as a Best Value Contractor with the Dane County Public Works Engineering Division before the award of contract. Obtain a *Best Value Contracting Application* by calling 608/266-4018 or complete one online at:

www.co.dane.wi.us/pwht/BVC_Application.aspx

EQUAL BENEFITS REQUIREMENT

By submitting a Bid, the contractor acknowledges that a condition of this contract is to provide equal benefits as required by Dane County Code of Ordinances Chapter 25.016. Contractor shall provide equal benefits as required by that Ordinance to all required employees during the term of the contract. For more information:

www.danepurchasing.com/partner_benefit.aspx

OBTAIN D-U-N-S NUMBER, CCR NUMBER AND REVIEW ALL ARRA REPORTING

In order to be selected as successful bidder, the contractor must obtain a free D-U-N-S number. A D-U-N-S number is a unique nine-digit sequence recognized as the universal standard for identifying and keeping track of a business. The D-U-N-S number may be obtained by the following link: http://www.dnb.com/us/duns_update/index.html.

Central Contractor Registration (CCR) is the primary registrant database for the U.S. Federal Government. CCR collects, validates, stores and disseminates data in support of agency acquisition missions. The CCR number may be obtained by the following link: https://www.bpn.gov/CCR/default.aspx.

The American Recovery and Reinvestment Act (ARRA) requires the contractor to provide information for monthly and quarterly reporting throughout the life of the project. Please review the attached ARRA reporting requirements before bidding.

DAVIS-BACON, EECBG, F.O.E., AND BUY AMERICAN PROVISIONS

Davis-Bacon wage rates will supersede Wisconsin Prevailing Wage Rates for this project. The Davis-Bacon wage rates are provided in the Supplementary Conditions and may be modified prior to bid opening. (Except if modified within ten days of Bid Opening.)

This project is funded by the Energy Efficiency Conservation Block Grant (EECBG). Information about the EECBG can be found at: http://www.eecbg.energy.gov/.

Focus On Energy rebates will be applied for during this project. Information about F.O.E. can be found at: http://www.focusonenergy.com/.

All products used in this project will be required to meet Buy American Provisions. Guidance for meeting Buy American Provisions can be found at: http://www1.eere.energy.gov/recovery/buy_american_provision.html.

FAIR LABOR PRACTICES CERTIFICATION

The undersigned, for and on behalf of the BIDDER, APPLICANT or PROPOSER named herein, certifies as follows:

A. That he or she is an officer or duly authorized agent of the above-referenced BIDDER, APPLICANT or PROPOSER, which has a submitted a proposal, bid or application for a contract with the county of Dane.

B. That BIDDER, APPLICANT or PROPOSER has (check one):

_____ not been found by the National Labor Relations Board ("NLRB") or the Wisconsin Employment Relations Commission ("WERC") to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

_____ been found by the National Labor Relations Board ("NLRB") or the Wisconsin Employment Relations Commission ("WERC") to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

_____ _____
Officer or Authorized Agent Signature Date

_____
Printed or Typed Name and Title

_____
Printed or Typed Business Name

NOTE: You can find information regarding the violations described above at: www.nlrb.gov and werc.wi.gov.

For reference, Dane County Ordinance 25.11(28)(a) is as follows:
(28) BIDDER RESPONSIBILITY. (a) Any bid, application or proposal for any contract with the county, including public works contracts regulated under chapter 40, shall include a certification indicating whether the bidder has been found by the National Labor Relations Board (NLRB) or the Wisconsin Employment Relations Committee (WERC) to have violated any statute or regulation regarding labor standards or relations within the last seven years. The purchasing manager shall investigate any such finding and make a recommendation to the committee, which shall determine whether the conduct resulting in the finding affects the bidder's responsibility to perform the contract.

If you indicated that the NLRB or WERC have found you to have such a violation, you must include copies of any relevant information regarding such violation with your proposal, bid or application.

DANE COUNTY DEPARTMENT of PUBLIC WORKS, HIGHWAY and TRANSPORTATION

County Executive
Kathleen M. Falk

1919 Alliant Energy Center Way ◆ Madison, Wisconsin 53713
Phone: (608) 266-4018 ◆ FAX: (608) 267-1533

Commissioner / Director
Gerald J. Mandli

BEST VALUE CONTRACTING APPLICATION

CONTRACTORS / LICENSURE APPLICANTS

The Dane County Department of Public Works requires all contractors to be pre-qualified as a best value contractor with the County prior to being awarded a contract. In addition, the County pre-qualifies potential contractors and sub-contractors who wish to work on County contracts. Subcontractors must become pre-qualified ten (10) days prior to commencing work under any Dane County Public Works Contract. Potential subcontractors are urged to become pre-qualified as early as possible. This document shall be completed, properly executed, along with the necessary attachments and additional information that the County requires for the protection and welfare of the public in the performance of a County contract.

Contractors or subcontractors of any tier who attain prequalification status will retain that status for a period of two (2) years from the date of qualification. Contractors shall notify the Dane County Department of Public Works, Highway & Transportation within 15 days of any changes to its business or operations that are relevant to the prequalification application. Failure to do so could result in suspension, revocation of the contractor's prequalification, debarment from County contracts for up to three years and / or other sanctions available under the law.

No contracts will be awarded for construction work performed on Dane County projects unless the contractor is currently approved as a Wisconsin Trade Trainer or has applied for approval as an Apprenticeship Trade Trainer to the Wisconsin Department of Workforce Development and agrees to an acceptable apprenticeship program. If you are not currently approved as a Wisconsin Trade Trainer, or have not applied for approval as an Apprenticeship Trade Trainer, please contact the Department of Workforce Development - Bureau of Apprenticeship Standards at 608/266-3133 or visit their web site at: dwd.wisconsin.gov/apprenticeship/.

EXEMPTIONS

- Contractors or subcontractors of any tier attain prequalification status with Dane County if the contractor has current Executive Order 108 precertification status with the State of Wisconsin.
- Contractors who employ less than five (5) apprenticeable trade workers are not required to prequalify.
- Contractors performing work that does not apply to an apprenticeable trade, as outlined in Appendix A.
- The contractor / subcontractor provides sufficient documentation to demonstrate one or more of the following:
    - apprentices are not available in a specific geographic area;
    - the applicable apprenticeship program is unsuitable or unavailable; or
    - there is a documented depression of the local construction market which prevents compliance.

SEC.	PROOF OF RESPONSIBILITY	CHECK IF APPLICABLE
1	Does your firm possesses all technical qualifications and resources, including equipment, personnel and financial resources, necessary to perform the work required for any project or obtain the same through the use of responsible, prequalified subcontractors?	Yes: ☐ No: ☐
2	Will your firm possess all valid, effective licenses, registrations or certificates required by federal, state, county, or local law, which are necessary for the type of work to be performed including, but not limited to, those for any type of trade work or specialty work?	Yes: ☐ No: ☐
3	Will your firm meet all bonding requirements as required by applicable law or contract specifications?	Yes: ☐ No: ☐
4	Will your firm meet all insurance requirements as required by applicable law or specifications, including general liability insurance, workers compensation insurance and unemployment insurance requirements?	Yes: ☐ No: ☐
5	Will your firm maintain a substance abuse policy for employees hired for public works contracts that comply with Wis. Stats. Sec. 103.503?	Yes: ☐ No: ☐
6	Does your firm acknowledge that it must pay all craft employees on public works projects the wage rates and benefits required under Section 66.0903 of the Wisconsin Statutes?	Yes: ☐ No: ☐
7	Will your firm fully abide by the equal opportunity and affirmative action requirements of all applicable laws, including County ordinances?	Yes: ☐ No: ☐
8	In the past three (3) years, has your firm had control or has another corporation, partnership or other business entity operating in the construction industry controlled it? If so, please attach a statement explaining the nature of the firm relationship?	Yes: ☐ No: ☐ If Yes, attach details.
9	In the past three (3) years, has your firm had any type of business, contracting or trade license, certification or registration revoked or suspended?	Yes: ☐ No: ☐ If Yes, attach details.
10	In the past three (3) years, has your firm been debarred by any federal, state or local government agency?	Yes: ☐ No: ☐ If Yes, attach details.
11	In the past three (3) years, has your firm defaulted or failed to complete any contract?	Yes: ☐ No: ☐ If Yes, attach details.
12	In the past three (3) years, has your firm committed a willful violation of federal, state or local government safety laws as determined by a final decision of a court or government agency authority.	Yes: ☐ No: ☐ If Yes, attach details.
13	In the past three (3) years, has your firm been in violation of any law relating to your contracting business where the penalty for such violation resulted in the imposition of a penalty greater than $10,000?	Yes: ☐ No: ☐ If Yes, attach details.
14	Is your firm Executive Order 108 precertified with the State of Wisconsin?	Yes: ☐ No: ☐
15	Is your firm an active Wisconsin Trade Trainer as determined by the Wisconsin Bureau of Apprenticeship Standards and listed at: dwd.wisconsin.gov/apprenticeship/executive_order108.htm?	Yes: ☐ No: ☐
16	Is your firm exempt from being prequalified with Dane County?	Yes: ☐ No: ☐ If Yes, attach reason for exemption.
17	Does your firm acknowledge that in doing work under any County Public Works Contract, it will be required to use as subcontractors only those contractors that are also prequalified with the County or become so ten days prior to commencing work?	Yes: ☐ No: ☐

SIGNATURE SECTION

Your firm's Officer, or the individual who would sign a bid and / or contract documents must sign this document.

I do hereby certify that all statements herein contained are true and correct to the best of my knowledge:

Signature _____ Date _____

Printed or Typed Name and Title _____

NAME AND ADDRESS OF CONTRACTOR	
Name of Firm:	
Address:	
City, State, Zip:	
Telephone Number:	
Fax Number:	
E-mail Address:	

REMEMBER!

Return all to forms and attachments, or questions to:

CALEB BARTH

EMAIL: BARTH.CALEB@CO.DANE.WI.US

OFFICE: (608)266-4592, CELL: (608)219-2917, FAX: (608)267-1533

DANE COUNTY DEPARTMENT OF PUBLIC WORKS,
HIGHWAY & TRANSPORTATION
1919 ALLIANT ENERGY CENTER WAY
MADISON, WI 53713

APPENDIX A

APPRENTICEABLE TRADES

Bricklayer
Carpenter
Cement Mason (Concrete Finisher)
Cement Mason (Heavy Highway)
Construction Craft Laborer
Data Communications Installer
Electrician
Elevator Mechanic / Technician
Environmental Systems Technician / HVAC Service Technician / HVAC Install & Service
Glazier
Heavy Equipment Operator / Operating Engineer
Insulation Worker (Heat & Frost)
Iron Worker (Assembler, Metal Buildings)
Painter / Decorator
Plasterer
Plumber
Roofer / Waterproofer
Sheet Metal Worker
Sprinkler Fitter
Steamfitter (Service & Refrigeration)
Taper & Finisher
Telecommunications (Voice, Data & Video) Installer / Technician
Tile Setter

COUNTY OF DANE

PUBLIC WORKS CONTRACT

Contract No. _____ Bid No. 310033

Authority: Res. _____, [2009-10]

THIS CONTRACT, made and entered into as of the date by which authorized representatives of both parties have affixed their signatures, by and between the County of Dane (hereafter referred to as "COUNTY") and _____ (hereafter, "CONTRACTOR"), and

W I T N E S S E T H :

WHEREAS, COUNTY, whose address is c/o Associate Public Works Director, 1919 Alliant Energy Center Way, Madison, WI 53713, desires to have CONTRACTOR provide Domestic Hot Water System Replacement With Heat Recovery at the City County Building ("the Project"); and

WHEREAS, CONTRACTOR, whose address is _____ _____ is able and willing to construct the Project, in accordance with the Construction Documents;

NOW, THEREFORE, in consideration of the above premises and the mutual covenants of the parties hereinafter set forth, the receipt and sufficiency of which is acknowledged by each party for itself, COUNTY and CONTRACTOR do agree as follows:

1. CONTRACTOR agrees to construct, for the price of $_____ the Project and at the CONTRACTOR'S own proper cost and expense to furnish all materials, supplies, machinery, equipment, tools, superintendence labor, insurance, and other accessories and services necessary to complete the Project in accordance with the conditions and prices stated in the Bid Form, General Conditions of Contract, the drawings which include all maps, plats, plans, and other drawings and printed or written explanatory matter thereof, and the specifications therefore as prepared by Engineering 370 LLC (hereinafter referred to as "the Architect / Engineer"), and as enumerated in the Project Manual Document Index, all of which are made a part hereof and collectively evidence and constitute the Contract.

2. COUNTY agrees to pay the CONTRACTOR in current funds for the performance of the Contract subject to additions and deductions, as provided in the General Conditions of Contract and to make payments on account thereof as provided in Article entitled, "Payments to Contractor" of the General Conditions of Contract.

3. During the term of this Contract, CONTRACTOR agrees to take affirmative action to ensure equal employment opportunities. The CONTRACTOR agrees in accordance with Wisconsin Statute 111.321 and Chapter 19 of the Dane County Code of Ordinances not to discriminate on the basis of age, race, ethnicity, religion, color, gender, disability, marital status, sexual orientation, national origin, cultural differences, ancestry, physical appearance, arrest record or conviction record, military participation or membership in the national guard, state defense force or any other reserve component of the military forces of the United States, or political beliefs.

Such equal opportunity shall include, but not be limited to, the following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation. CONTRACTOR agrees to post in conspicuous places, available to all employees and applicants for employment, notices setting forth the provisions of this paragraph.

4. CONTRACTOR shall file an Affirmative Action Plan with the Dane County Contract Compliance Officer in accord with Chapter 19 of the Dane County Code of Ordinances. CONTRACTOR must file such plan within fifteen (15) days of the effective date of this Contract. During the term of this Contract CONTRACTOR shall also provide copies of all announcements of employment opportunities to COUNTY'S Contract Compliance Office, and shall report annually the number of persons, by race, ethnicity, gender, and disability status, which apply for employment and, similarly classified, the number hired and number rejected.

5. During the term of this Contract, all solicitations for employment placed on CONTRACTOR'S behalf shall include a statement to the effect that CONTRACTOR is an "Equal Opportunity Employer."

6. CONTRACTOR agrees to comply with provisions of Chapter 25.016 of the Dane County Code of Ordinances, which pertains to domestic partnership benefits.

7. CONTRACTOR agrees to furnish all information and reports required by COUNTY'S Contract Compliance Officer as the same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance with Chapter 19, Dane County Code of Ordinances, and the provisions of this Contract.

8. CONTRACTOR agrees that all persons employed by CONTRACTOR or any subcontractor shall be paid no less than the minimum wage established under Chapter 40, Subchapter II, Dane County Code of Ordinances. CONTRACTOR agrees to abide by and comply with the provisions of Chapter 40, Subchapter II of the Dane County Code of Ordinances, and said Subchapter is fully incorporated herein by reference.

9. This Contract is intended to be a Contract solely between the parties hereto and for their benefit only. No part of this Contract shall be construed to add to, supplement, amend, abridge or repeal existing rights, benefits or privileges of any third party or parties including, but not limited to, employees of either of the parties.

10. The entire agreement of the parties is contained herein and this Contract supersedes any and all oral agreements and negotiations between the parties relating to the subject matter hereof. The parties expressly agree that the express terms of this Contract shall not be amended in any fashion except in writing, executed by both parties.

11. CONTRACTOR must be pre-qualified as a Best Value Contractor with Dane County Public Works Engineering Division before award of Contract. Subcontractors must be pre-qualified ten (10) days prior to commencing Work under this Contract.

IN WITNESS WHEREOF, COUNTY and CONTRACTOR, by their respective authorized agents, have caused this Contract and its Schedules to be executed, effective as of the date by which all parties hereto have affixed their respective signatures, as indicated below.

* * * * * * *

FOR CONTRACTOR:

Signature _____ Date _____

Printed or Typed Name and Title _____

Signature _____ Date _____

Printed or Typed Name and Title _____

NOTE: If CONTRACTOR is a corporation, Secretary should attest. In accordance with IRS Regulations, unincorporated entities are required to provide either their Social Security or Employer Number in order to receive payment for services rendered.

* * * * * * *

This Contract is not valid or effectual for any purpose until approved by the appropriate authority designated below, and no work is authorized until the CONTRACTOR has been given notice to proceed by COUNTY'S Associate Public Works Director.

FOR COUNTY:

Kathleen M. Falk, County Executive _____ Date _____

Robert Ohlsen, County Clerk _____ Date _____

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A310

Bid Bond

Bond No.

KNOW ALL MEN BY THESE PRESENTS, that we

(Here insert full name and address or legal title of Contractor)

as Principal, hereinafter called the Principal, and

(Here insert full name and address or legal title of Surety)

a corporation duly organized under the laws of the State of WI as Surety, hereinafter called the Surety, are held and firmly bound unto

(Here insert full name and address or legal title of Owner)

as Obligee, hereinafter called Obligee, in the sum of ( ) Percent of total amount bid

Dollars ($ Percent of attached bid).

For the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for Project No.:

(Here insert full name, address, and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this day of , 20 .

(Principal) (Seal)

(Witness)

(Title)

(Surety) (Seal)

(Witness)

ATTORNEY-IN-FACT

THE AMERICAN INSTITUTE OF ARCHITECTS

Bond No.

AIA Document A312

Performance Bond

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT
Date:
Amount: **$**
Description (Name and Location):

BOND
Date (Not earlier than Construction Contract Date):
Amount: **$**
Modifications to this Bond: [ ] None [ ] See Page 3

CONTRACTOR AS PRINCIPAL
COMPANY: (Corporate Seal)

SURETY COMPANY:
(Corporate Seal)

Signature: _____
Name and Title:

Signature: _____
Name and Title:
Attorney-in-Fact

(Any additional signatures appear on page 3)

FOR INFORMATION ONLY-Name, Address and Telephone AGENT OR BROKER:

OWNER'S REPRESENTATIVE (Architect, Engineer or other party):

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3.1.

3. If there is no Owner Default, the Surety's obligation under this Bond shall arise after:

3.1 The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and

3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Subparagraph 3.1; and

3.3 The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the Owner.

4. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

4.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract; or

4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or

4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

4.4 Waive its rights to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

1. After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or

2. Deny liability in whole or in part and notify the Owner citing reasons therefor.

5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

6. After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Subparagraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:

6.1 The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

6.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and

6.3 Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, or successors.

8. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12 DEFINITIONS

12.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

12.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

12.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

12.4 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature: _____		Signature: _____	
Name and Title:		Name and Title:	
Address:		Address:	

THE AMERICAN INSTITUTE OF ARCHITECTS

Bond No.

AIA Document A312

Payment Bond

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT
Date:
Amount: **$**
Description (Name and Location):

BOND
Date (Not earlier than Construction Contract Date):
Amount: **$**
Modifications to this Bond: [ ] None [ ] See Page 6

CONTRACTOR AS PRINCIPAL
COMPANY: (Corporate Seal)

SURETY COMPANY:
(Corporate Seal)

Signature: _____
Name and Title:

Signature: _____
Name and Title:
Attorney-in-Fact

(Any additional signatures appear on page 6)

FOR INFORMATION ONLY-Name, Address and Telephone
AGENT OR BROKER:

OWNER'S REPRESENTATIVE (Architect, Engineer or other party):

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.

2. With respect to the Owner, this obligation shall be null and void if the Contractor:

2.1 Promptly makes payment, directly, or indirectly, for all sums due Claimants, and

2.2 Defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity whose claim, demand, lien or suit is for the payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.

4. The Surety shall have no obligation to Claimants under this Bond until:

4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2 Claimants who do not have a direct contract with the Contractor:

1. Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and

2. Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and

3. Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.

5. If a notice required by Paragraph 4 is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.

6. When the Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:

6.1 Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

6.2 Pay or arrange for payment of any undisputed amounts.

7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

8. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

9. The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Subparagraph 4.1 or Clause 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor

shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. DEFINITIONS

15.1 Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

15.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature: _____		Signature: _____	
Name and Title:		Name and Title:	
Address:		Address:	

GENERAL CONDITIONS OF CONTRACT

TABLE OF CONTENTS

1. CONSTRUCTION DOCUMENTS

A. Construction Documents, listed in Table of Contents of this Specification volume shall form part of this Contract and provisions of Construction Documents shall be as binding upon parties as if they were fully set forth in Contract itself.

B. These shall also be considered as part of Construction Documents: Addenda, including additions and modifications incorporated in such addenda before execution of Contract; requests for information; construction bulletins; change orders; and written interpretations by Engineer or Public Works Project Engineer that are made after execution of Contract.

C. Construction Documents are complementary, and what is required by one shall be as binding as if required by all. Intent of Construction Documents is to include all labor, materials and equipment necessary for proper execution of the Work.

2. DEFINITIONS

A. These terms as used in this Contract are respectively defined as follows:
   1. All uses of term "County" in Construction Documents shall mean Dane County.
   2. All uses of term "Department" in Construction Documents shall mean Department of Public Works, Highway & Transportation, which is a unit of Dane County government. Department is County agency overseeing Contract with Contractor.
   3. Public Works Project Engineer is appointed by and responsible to Department. Public Works Project Engineer has authority to act on behalf of Department and will sign change orders, payment requests and other administrative matters related to projects.
   4. Public Works Project Engineer is responsible for supervision, administration and management of field operations involved in construction phase of this Work.
   5. Term "Work" includes all labor, equipment and materials necessary to produce project required by Construction Documents.
   6. Term "Substantial Completion" is date when project or specified area of project is certified by Engineer that construction is sufficiently completed, in accordance with Construction Documents, and as modified by any subsequent changes agreed to by parties, so that County may occupy project or specified area of project for use for which it was intended subject to permit approval for occupancy.
   7. Contractor is person, firm, or corporation with whom County makes Contract. Though multiple contracts may be involved, Construction Documents treat them throughout as if each were of singular number.

3. ADDITIONAL INSTRUCTIONS AND DRAWINGS

A. Contractor may be furnished additional instructions and detail drawings as necessary to carry out the Work included in Contract. Additional drawings and instructions thus supplied to Contractor will coordinate with Construction Documents and will be so prepared that they can be reasonably interpreted as part thereof. Contractor shall carry out the Work in accordance with additional detail drawings and instructions.

4. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. Unless otherwise specified, Contractor shall submit three (3) copies of all Shop Drawings for each submission, until receiving final approval. After final approval, provide five (5) additional copies for distribution and such other copies as may be required.

B. Contractor shall submit, on an on-going basis and as directed, Product Data such as brochures that shall contain catalog cuts and specifications of all furnished mechanical and electrical equipment. After Engineer's approval, one (1) copy shall remain in Engineer's file, one (1) kept at Department's office and one (1) kept at job site by Contractor for reference purposes.

C. Samples shall consist of physical examples furnished by Contractor in sufficient size and quantity to illustrate materials, equipment or workmanship, and to establish standards to compare the Work.
   1. Submit Samples in sufficient quantity (minimum of two (2)) to permit Engineer to make all necessary tests and of adequate size showing quality, type, color range, finish, and texture. Label each Sample stating material, type, color, thickness, size, project name, and Contractor's name.
   2. Submit transmittal letter requesting approval, and prepay transportation charges to Engineer's office on samples forwarded.
   3. Materials installed shall match approved Samples.

D. Contractor shall review Shop Drawings and place their dated stamp thereon to evidence their review and approval and shall submit with reasonable promptness and in orderly sequence to cause no delay in the Work or in work of any other contractor. At time of submission, Contractor shall inform Engineer in writing of any deviation in Shop Drawings or Samples from requirements of Construction Documents. Engineer will not consider partial lists.

E. Engineer will review and approve or reject Shop Drawings with reasonable promptness to cause no delay. Engineer's approval shall not relieve Contractor from responsibility for errors or omission in Shop Drawings.

F. Contractor shall not commence any work requiring Shop Drawing, Product Data or Sample submission until Engineer has approved submission. All such work shall be in accordance with approved Shop Drawings, Product Data and Samples.

G. Contractor shall keep on site of the Work, approved or conformed copy of Shop Drawings and shall at all time give Department access thereto.

H. By stamping and submitting Shop Drawings, Product Data and Samples, Contractor thereby represents that he or she has or will determine and verify all field measurements, field construction criteria, materials, catalog numbers, and similar data and that he or she has checked and coordinated each Shop Drawing, Product Data and Sample with requirements of the Work and of Construction Documents. Engineer shall return without examination, Shop Drawings, Product Data and Samples not so noted.

I. All Shop Drawings from any one Contractor should be numbered consecutively and on cover sheet shall bear name and location of project, name of Contractor, date of submittal and date of each correction or revision and associated Specification section and page number.

5. CUTTING AND PATCHING

A. Contractor shall be responsible for all cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

B. Contractor shall not damage or endanger portion of the Work or fully or partially completed construction of County or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. Contractor shall not cut or otherwise alter such construction by County or separate contractor except with written consent of County and of such separate

contractor; such consent shall not be unreasonably withheld. Contractor shall not withhold unreasonably from County or separate contractor, Contractor's consent to cutting or otherwise altering the Work.

6. CLEANING UP

A. Contractor shall keep premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under Contract. Contractor shall remove from and about the Work waste materials, rubbish, Contractor's tools, construction equipment, machinery, and surplus materials at completion of the Work. Contractor shall maintain streets and sidewalks around the Work site in clean condition. Contractor shall remove all spillage and prevent tracking of spillage arising from performance of the Work, into, out of, and within the Work site. Contractor shall establish regular maintenance program of sweeping, vacuuming and / or hosing to minimize accumulation of dirt and dust upon such areas.

B. If Contractor fails to clean up as directed in Construction Documents, County may do so and shall charge Contractor cost thereof.

C. Contractor shall be responsible for broken windows and glass, and at completion of the Work shall replace such damaged or broken windows and glass. After replacing damaged or broken windows and glass, Contractor shall remove all labels, wash and polish both sides of all windows and glass.

D. In addition to general cleaning (sweeping, vacuuming and / or hosing, as is appropriate to work surface), Contractor shall perform following final cleaning for all trades at completion of the Work:
   1. Remove temporary protections;
   2. Remove marks, stains, fingerprints and other soil or dirt from painted, decorated and finished woodwork and wall surfaces;
   3. Remove spots, plaster, soil and paint from ceramic tile, marble and other finished materials, and wash or wipe clean;
   4. Clean fixtures, cabinet work and equipment, removing stains, paint, dirt and dust, and leave same in undamaged, new condition;
   5. Clean aluminum in accordance with recommendations of manufacturer; and
   6. Clean resilient floors thoroughly with well-rinsed mop containing only enough moisture to clean off any surface dirt or dust and buff dry by machine to bring surfaces to sheen.

7. USE OF SITE

A. Contractor shall provide County and Engineer access to the Work under all circumstances.

B. Contractor shall confine operations at site to areas permitted by County, law, ordinance, permits and Construction Documents and shall not unreasonably encumber site with materials or equipment. Contractor shall assure free, convenient, unencumbered, direct and safe access to all properties adjacent to the Work for County, its employees, invitees and guests.

8. MATERIALS AND WORKMANSHIP

A. Contractor shall perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, necessary to complete the Work required by this Contract, within time specified, in accordance with provisions of Construction Documents.

B. All equipment and materials incorporated in the Work covered by this Contract are to be new; use recycled and / or recovered materials to extent that such use is technically and economically feasible. Recovered materials are products recovered from solid waste in form identical to original form for use that is same as, or similar to original use. Recycled materials are products manufactured from solid waste.

C. If requested, Contractor shall furnish satisfactory evidence as to kind and quality of construction materials proposed or used. Contractor shall furnish to Engineer, for approval, manufacturer name and model, performance capacities and other pertinent information of machinery, mechanical, electrical or other types of equipment, which Contractor plans to install.

D. If not otherwise provided, materials and labor called for in this Contract shall be provided and performed in accordance with established practice and standards recognized by Architects, Engineers, Department, and construction industry.

E. Reference to "Standard" specifications of any association or manufacturer, or codes of County authorities, intends most recent printed edition or catalog in effect on date that corresponds with date of Construction Documents.

F. Whenever reference is made in Specifications that work shall be "performed", "applied", in accordance with "manufacturer's directions or instructions", Contractor to whom those instructions are directed shall furnish three (3) printed copies of such instructions to Engineer before execution of the Work.

9. CONTRACTOR'S TITLE TO MATERIALS

A. Contractor or any subcontractor shall not purchase materials or supplies for the Work subject to any chattel mortgage or under conditional sale contract or other agreement by which seller retains interest. Contractor warrants that all materials and supplies used in the Work are free from all liens, claims or encumbrances and Contractor has good title to them.

10. "OR EQUAL" CLAUSE

A. Whenever equipment or materials are identified on Drawings or in Specifications by reference to manufacturer's or vendor's name, trade name, catalog number, and other identifying information, it is intended to establish standards; and any equipment or material of other manufacturers and vendors which will perform adequately duties imposed by general design will be considered equally accepted provided equipment or material so proposed is, in opinion of Engineer, of equal substance and function. Engineer and Department shall provide written approval before Contractor may purchase or install it.

B. Equipment or materials of manufacturers, other than those named, may be used only upon following conditions:
   1. That, in opinion of Engineer and Department, proposed material or equipment item is fully equal or superior (in design, materials, construction, workmanship, performance, finish, etc.) to named item. No compromise in quality level, however small, is acceptable.
   2. That, in substituting materials or equipment, Contractor assumes responsibility for any changes in system or for modifications required in adjacent or related work to accommodate such substitution despite Engineer's and Department's approval, and all

costs growing out of approval of "or equal" items shall be responsibility of Contractor. No extra costs resulting from such approval shall become responsibility of Department, Engineer or any other separate Contractor.

3. It shall be understood that use of materials or equipment other than those specified, or approved equal by Engineer and Department, shall constitute violation of Contract, and that Engineer and Department shall have right to require removal of such materials or equipment and their replacement with specified materials or equipment at Contractor's expense.
4. Product and manufacturer named first in Specifications or on information shown on Drawings is basis of selection of manufactured items and equipment, particularly mechanical equipment. In using other than first named products or manufacturers, including those specified as additionally approved or acceptable, Contractor assumes responsibility for any changes in system and for modifications in any work required to accommodate them. Engineer's approval of such additionally acceptable products or manufacturers, either in Specifications or in Addendum, does not relieve Contractor from obligation to coordinate such optional products with other Contractors, whose work may be affected by them, and to pay all additional costs resulting from their inclusion into the Work. Contractor's liability shall include payment of Engineer's fees for any additional services made necessary by or directly connected to such product changes. No extra costs resulting from such changes shall become responsibility of Department, Engineer or any other separate Contractor.

C. No request for approval of "or equal" materials will be entertained except from Contractor. Identify any request for substitution as substitution on Contractor's letter of transmittal and give reasons for substitution. Department may in its sole discretion allow substitutions of materials.

11. PATENTS AND ROYALTIES

A. If Contractor uses any design, device or material covered by letters, patent or copyright, it is mutually agreed and understood, that, without exception, contract prices shall include all royalties or costs arising from use of such design, device or materials, in any way involved in the Work.

B. Contractor shall indemnify and save harmless County from any and all claims for infringement by reason of use of such patent or copyright in connection with the Work agreed to be performed under this Contract, and shall indemnify County for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during prosecution of the Work or after completion of the Work.

12. SURVEYS, PERMITS, REGULATIONS AND TAXES

A. Department will furnish to Contractor all site, topography and property surveys necessary for execution of the Work.

B. Contractor shall procure all permits, licenses and approvals necessary for execution of this Contract.

C. Contractor shall give all notices and comply with all State of Wisconsin, Federal and local laws, codes, rules and regulations relating to performance of the Work, protection of adjacent property, and maintenance of passageways, guard fences or other protective facilities.

D. Contractor shall pay all Sales, Consumer, Use and other similar taxes required by law.

E. Contractor shall promptly notify Engineer of any variances of Drawings or Specifications with that of any State of Wisconsin, federal or local law, code, rule or regulation. Upon such notification, Engineer will require correction of variance to comply with applicable law, code, rule or regulation at no additional cost to Contractor.

F. Work under this Contract shall comply with all applicable State of Wisconsin, Federal and local laws, codes and regulations.

G. Contractor shall pay charges for water, sewer and other utility connections made by municipalities where required by Specifications.

13. CONTRACTOR'S OBLIGATIONS AND SUPERINTENDENCE

A. Contractor shall provide and pay for all materials, labor, tools, equipment, transportation and superintendence necessary to execute, complete and deliver the Work within specified time. Contractor agrees to secure at their own expense all personnel necessary to carry out the Work. Such personnel shall not be deemed County employees nor shall they have or be deemed to have any direct contractual relationship with County.

B. Performance of any work necessary after regular working hours, on Sundays or Legal Holidays shall be without additional expense to County. Performance of any work at site at other than normal working hours must be coordinated with Public Works Project Engineer.

C. Contractor shall furnish, erect, maintain and remove such temporary works as may be required.

D. Contractor shall observe, comply with, and be subject to all terms, conditions, requirements and limitations of Construction Documents.

E. At the Work site, Contractor shall give personal superintendence to the Work or shall employ construction superintendent or foreman, experienced in character of work covered by Contract, who shall have full authority to act for Contractor. Understand that such superintendent or foreman shall be acceptable to Engineer and Department.

F. Remove from project or take other corrective action upon notice from Engineer or Department for Contractor's employees whose work is considered by Engineer or Department to be unsatisfactory, careless, incompetent, unskilled or otherwise objectionable.

G. Contractor and subcontractors shall be required to conform to Labor Laws of State of Wisconsin and various acts amendatory and supplementary thereto and to other laws, ordinances and legal requirements applicable to the Work.

H. Presence and observation of the Work by Engineer or Public Works Project Engineer shall not relieve Contractor of any obligations.

14. WEATHER CONDITIONS

A. In event of temporary suspension of work, or during inclement weather, or whenever Engineer shall direct, Contractor shall, and shall cause subcontractors to protect carefully all work and materials against damage or injury from weather. If, in opinion of Engineer or

Department, any work or materials that have been damaged or injured due to failure on part of Contractor or any subcontractors so to protect the Work, such materials shall be removed and replaced at expense of Contractor.

15. PROTECTION OF WORK AND PROPERTY

A. Contractor shall at all times safely guard County's property from injury or loss in connection with this Contract. Contractor shall at all times safely guard and protect the Work, and adjacent property, from damage. Contractor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in Contract, or by County, or County's duly authorized representative.

B. Contractor may act diligently, without previous instructions from Engineer and / or Department, in emergency that threatens loss or injury of property, or safety of life. Contractor shall notify Engineer and / or Department immediately thereafter. Promptly submit any claim for compensation by Contractor due to such extra work to Engineer and / or Department for approval as provided for in Article 18 herein.

16. INSPECTION AND TESTING OF MATERIALS

A. Authorized representatives and agents of County government shall have access at all times to the Work wherever it is in preparation or progress and Contractor shall provide facilities for such access and for inspection.

B. Should it be considered necessary or advisable at any time before final acceptance of the Work to make examination of work already completed, by removing or tearing out same, Contractor shall upon request, promptly furnish all necessary facilities, labor and materials. If such work is found to be defective in any aspect, due to fault of Contractor or subcontractors thereof, Contractor shall assume all expenses of such examination and of satisfactory reconstruction. Contractor will be reimbursed for such examination and replacement in accordance with Article 18 - A.3., of these General Conditions of Contract if such work is found to meet requirements of Contract.

C. If Specifications, Engineer's, or Public Works Project Engineer's instructions require any work to be specially tested or approved, Contractor shall give Engineer and Public Works Project Engineer timely notice of its readiness for testing or inspection. Test all materials and equipment requiring testing in accordance with accepted or specified standards, as applicable. Engineer shall recommend laboratory or inspection agency and Department will select and pay for all initial laboratory inspection services. Should retesting be required, due to failure of initial testing, cost of such retesting shall be borne by Contractor.

D. Cost of any testing performed by manufacturers or Contractor for substantiating acceptability of proposed substitution of materials and equipment, or necessary conformance testing in conjunction with manufacturing processes or factory assemblage, shall be borne by Contractor or manufacturer responsible.

17. REPORTS, RECORDS AND DATA

A. Contractor shall submit to Engineer and Public Works Project Engineer such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, invoices, records and other data as either may request concerning work performed or to be performed under this Contract.

18. CHANGES IN THE WORK

A. Make no changes, except in cases of emergency, in the Work covered by approved Construction Documents without having prior written approval of Department. Charges or credits for the Work covered by approved change shall be determined by one of these methods:
   1. Unit bid prices previously approved.
   2. Agreed lump sum based on actual cost of:
      a) Labor, including foremen, and all fringe benefits that are associated with their wages.
      b) Materials entering permanently into the Work.
      c) Ownership or rental cost of construction tools and equipment during time of use on extra work.
      d) Power and consumable supplies for operation of power equipment.
      e) Workmen's Compensation Insurance, Contractor's Public Liability and Property Damage Insurance, and Comprehensive Automobile Liability Insurance.
      f) Social Security and old age and unemployment contributions.
      g) Add to cost under (2), fixed fee to be agreed upon, but not to exceed fifteen percent (15%) of actual cost of work performed with their own labor force. Fee shall be compensation to cover cost of supervision, overhead, bond, profit and any other general expense.
      h) On that portion of the Work under (2) done under subcontract, Contractor may include not over seven and one-half percent (7½%) for supervision, overhead, bond, profit and any other general expense.
      i) Department may require correct amount of costs with supporting vouchers; Contractor shall keep and present in such form as directed.
   3. Cost-plus work, with not-to-exceed dollar limit, based on actual cost of:
      a) Labor, including foremen, and all fringe benefits that are associated with their wages.
      b) Materials entering permanently into the Work.
      c) Ownership or rental cost of construction tools and equipment during time of use on extra work. Rental cost cannot exceed fifty percent (50%) replacement value of rented equipment.
      d) Power and consumable supplies for operation of power equipment.
      e) Workmen's Compensation Insurance, Contractor's Public Liability and Property Damage Insurance, and Comprehensive Automobile Liability Insurance.
      f) Social Security and old age and unemployment contributions.
      g) To cost under (3), there shall be added fixed fee to be agreed upon but not to exceed fifteen percent (15%) of actual cost of work performed with their own labor force. Fee shall be compensation to cover cost of supervision, overhead, bond, profit, and any other general expense.
      h) On that portion of the Work under (3) done under subcontract, Contractor may include not over seven and one-half percent (7½%) for supervision, overhead, bond, profit, and any other general expense.
      i) Contractor shall keep and present, in such form as directed, correct amount of cost together with such supporting vouchers as may be required by Department.

B. If Contractor claims that by any instructions given by Engineer, Department, by drawings or otherwise, regarding performance of the Work or furnishing of material under Contract, involves extra cost, Contractor shall give Department written notice of cost thereof within two (2) weeks after receipt of such instructions and in any event before proceeding to execute work, unless delay in executing work would endanger life or property.

C. No claim for extra work or cost shall be allowed unless it was done in pursuance of written Change Order from Engineer and approved by Department, as previously mentioned, and claim presented with payment request submitted after changed or extra work is completed.

D. Negotiation of cost for change in the Work shall not be cause for Contractor to delay prosecution of the Work if Contractor has been authorized in writing by Public Works Project Engineer to proceed.

19. EXTRAS

A. Without invalidating Contract, Department may order extra work or make changes by altering, adding to or deducting from the Work, contract sum being adjusted in accordance with Article 18 herein.

20. TIME FOR COMPLETION

A. Contractor agrees that the Work shall be prosecuted regularly and diligently and complete the Work as stated in Construction Documents.

21. CORRECTION OF WORK

A. All work, all materials whether incorporated in the Work or not, and all processes of manufacture shall at all times and places be subject to inspection of Engineer and Public Works Project Engineer who shall be judge of quality and suitability of the Work, materials, and processes of manufacture for purposes for which they are used. Should they fail to meet Engineer's and Public Works Project Engineer's approval they shall be reconstructed, made good, replaced or corrected, by Contractor at Contractor's expense. Immediately remove all rejected material from site.

B. If Contractor defaults or neglects to carry out the Work in accordance with Construction Documents or fails to perform any provision of Contract, Department may, after ten (10) days' written notice to Contractor and without prejudice to any other remedy County may have, make good such deficiencies. In such case, appropriate Change Order shall be issued deducting from Contractor's payments then or thereafter, cost of correcting such deficiencies, including cost of Engineer's additional services made necessary by such default, neglect or failure.

22. SUBSURFACE CONDITIONS FOUND DIFFERENT

A. If Contractor encounters subsurface or latent conditions at site materially differing from those shown on Drawings or indicated in Specifications, Contractor shall immediately give notice to Engineer and Public Works Project Engineer of such conditions before they are disturbed. Engineer will thereupon promptly investigate conditions, and if Engineer finds that they materially differ from those shown on Drawings or indicated in Specifications, Engineer will at once make such changes as necessary, any increase or decrease of cost resulting from such changes to be adjusted in manner provided in above Article 18 entitled "Changes in the Work".

23. RIGHT OF DEPARTMENT TO TERMINATE CONTRACT

A. In event that any provisions of this Contract are violated by Contractor or by any subcontractors, County may serve written notice upon Contractor and Surety of its intention to terminate Contract, such notice to contain reasons for such intention to terminate Contract, and unless within ten (10) days after serving of such notice upon Contractor, such violation or delay shall cease and satisfactory arrangement or correction be made, Contract shall, upon expiration of said ten (10) days, cease and terminate.

B. In event of any such termination, County shall immediately serve notice thereof upon Surety and Contractor, and Surety shall have right to take over and perform Contract subject to County's approval; provided, however, that if Surety does not commence performance thereof within ten (10) days from date of mailing to such Surety of notice of termination, County may take over the Work and prosecute same to completion by contract, or by force account, at expense of Contractor; Contractor and Surety shall be liable to County for any excess cost occasioned County thereby, and in such event County may take possession of and utilize in completing the Work, such materials and equipment as may be on the Work site and therefore necessary.

24. CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES

A. Contractor shall be responsible for Construction Schedule and coordination. Immediately after execution and delivery of Contract and before making first payment, Contractor shall notify all subcontractors to furnish all required information to develop Construction Schedule. Contractor and all subcontractors associated with the Work shall furnish following information from each Division of Specifications:
   1. List of construction activities;
   2. Start, finish and time required for completion of each activity;
   3. Sequential relationships between activities;
   4. Identify all long lead-time items, key events, meetings or activities such as required submittals, fabrication and delivery, procurement of materials, installation and testing;
   5. Weekly definition of extent of work and areas of activity for each trade or Subcontract; and
   6. Other information as determined by Public Works Project Engineer.

B. In addition to above requested items, Contractor shall request delivery dates for all County-furnished equipment, materials or labor. This shall include any work handled by Department under separate contracts such as asbestos abatement, air and water balancing, etc. Indicate on Construction Schedule these associated delivery and installation dates.

C. Progress Reporting:
   1. Contractor shall update and publish Construction Schedule on monthly basis. Revisions to Schedule shall be by Contractor and made in same detail as original Schedule and accompanied by explanation of reasons for revision; and shall be subject to approval by Department.
   2. Failure of Contractor to keep Schedule in updated format shall result in County hiring firm specializing in construction schedule development and deducting those costs associated with updating process from payments due Contractor.
   3. Contractor shall submit show actual percentage of each activity completed, estimated future progress, and anticipated completion time.

D. Responsibility for timely completion requires:
   1. Contractor and subcontractors understand that performance of each is interdependent upon performance of others.

2. Whenever it becomes apparent from current schedule, that phasing or progress completion dates will not be met, Contractor must take some or all following actions at no additional cost to County:
    a) Increase construction manpower in such quantities and crafts as will eliminate backlog of work.
    b) Increase number of working hours per shift, shifts per working day, working days per week, amount of construction equipment, or any combination of foregoing to eliminate backlog of work.
    c) Reschedule work (yet remain in conformance with Drawings and Specifications).
3. Prior to proceeding with any of above actions, Contractor shall notify Public Works Project Engineer.

E. Maintain current Construction Schedule at all times. Revise Construction Schedule in same detail as original and accompany with explanation of reasons for revision. Schedule shall be subject to approval by Engineer and Public Works Project Engineer.

25. PAYMENTS TO CONTRACTOR

A. Contractor shall provide:
    1. Detailed estimate giving complete breakdown of contract price by Specification Division; and
    2. Periodic itemized estimates of work done for purpose of making partial payments thereon.

    Submit these estimates for approval first to Engineer, then to Public Works Project Engineer. Costs employed in making up any of these schedules are for determining basis of partial payments and not considered as fixing basis for additions to or deductions from Contract price.

B. County will make partial payments to Contractor for value, proportionate to amount of Contract, of all labor and material incorporated in the Work during preceding calendar month upon receipt of Application and Certificate for Payment form from Engineer and approval of Department.

C. Contractor shall submit for approval first to Engineer, and then to Public Works Project Engineer all Application and Certificate for Payment forms. If requested, Application and Certificate for Payment shall be supported by such additional evidence as may be required, showing Contractor's right to payment claimed.

D. Application and Certificate for Payment for preparatory work and materials delivered and suitably stored at site to be incorporated into the Work at some future period, will be given due consideration. Requesting payment for materials stored off site, may be rejected, however, if deemed essential for reasons of job progress, protection, or other sufficient cause, requests will be considered, conditional upon submission by Contractor of bills of sale, photographs and such other procedures as will adequately protect County's interest such as storage in bonded warehouse with adequate coverage. If there is any error in payment, Contractor is obligated to notify Department immediately, but no longer than ten (10) days from receipt of payment.

E. Payments by County will be due within forty-five (45) days after receipt by Department of Application and Certificate for Payment.

F. County will retain five percent (5%) of each Application and Certificate for Payment until final completion and acceptance of all the Work covered by Contract. However, anytime

after fifty percent (50%) of the Work has been furnished and installed at site, County will make remaining payments in full if Engineer and Public Works Project Engineer find that progress of the Work corresponds with Construction Schedule. If Engineer and Public Works Project Engineer find that progress of the Work does not correspond with Construction Schedule, County may retain up to ten percent (10%) of each Application and Certificate for Payment for the Work completed.

G. All material and work covered by partial payments made shall become sole property of County, but this provision shall not be construed as relieving Contractor from sole responsibility for care and protection of materials and work upon which payments have been made, or restoration of any damaged work, or as waiver of right of County to require fulfillment of all of terms of Contract.

H. County will make final payment within sixty (60) days after final completion of the Work, and will constitute acceptance thereof.

I. County may make payment in full, including retained percentages and less authorized deductions, upon completion and acceptance of each Division where price is stated separately in Contract.

J. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit to this Department, as requested and with final application for payment for work under said contract, affidavit(s) as required to prove that all debts and claims against this Work are paid in full or otherwise satisfied, and give final evidence of release of all liens against the Work and County. If Wisconsin Prevailing Wage Rate Determination is required for this Work, use "Prime Contractor Affidavit of Compliance With Prevailing Wage Rate Determination" and "Agent or Subcontractor Affidavit of Compliance With Prevailing Wage Rate Determination" (if applicable). If Wisconsin Prevailing Wage Rate Determination is not required for this Work, use "Dane County, Wisconsin Contractor Wage Affidavit". Forms of such affidavits are included in Supplementary Conditions.

26. WITHHOLDING OF PAYMENTS

A. County, after having served written notice on said Contractor, may either pay directly any unpaid bills of which Department has written notice, or withhold from Contractor's unpaid compensation sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged; whereupon, payment to Contractor shall be resumed in accordance with terms of this Contract, but in no event shall these provisions be construed to impose any obligations upon County to either Contractor or Contractor's Surety.

B. In paying any unpaid bills of Contractor, County shall be deemed agent of Contractor, and any payment so made by County, shall be considered as payment made under Contract by County to Contractor and County shall not be liable to Contractor for any such payment made in good faith.

C. Contractor shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from all claims growing out of lawful demands of subcontractors, laborers, workmen, mechanics, material men, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in performance of this Contract.

D. At Department's request, Contractor shall furnish satisfactory evidence that all obligations of nature designated above have been paid, discharged or waived.

27. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

A. Making of final payment shall constitute waiver of all claims by County except those arising from:
   1. Unsettled lien;
   2. Faulty or defective work appearing after substantial completion;
   3. Failure of the Work to comply with requirements of Construction Documents; or
   4. Terms of any special guarantees required by Construction Documents.

B. Acceptance of final payment shall constitute waiver of all claims by Contractor.

28. PAYMENTS BY CONTRACTOR

A. Contractor shall pay following not later than fifth (5^{th}) day following each payment received from County:
   1. All transportation and utility services rendered;
   2. All materials, tools, and other expendable equipment that have been delivered at site of the Work to extent of ninety percent (90%) of cost thereof, and balance of cost thereof when said balance is paid to Contractor; and
   3. Each subcontractor, respective amount allowed Contractor because of work performed by subcontractor to extent of subcontractor's interest therein.

29. CONTRACT SECURITY

A. Contractor shall furnish Performance and Payment Bonds in amount at least equal to one hundred percent (100%) of Contract price as security for faithful performance of this Contract and payment of all persons performing labor on project under this Contract and furnishing materials in connection with this Contract.

B. Sample Performance and Payment Bonds that Contractor will be required to execute is bound into these Construction Documents. Before construction Contract is consummated, completed Performance and Payment Bonds must be approved by Department.

30. ASSIGNMENTS

A. Contractor shall not assign whole or any part of this Contract or any moneys due or to become due hereunder without written consent of Department. In case Contractor assigns all or any part of any moneys due or to become due under this Contract, instrument of assignment shall contain clause substantially to effect that it is agreed that right of assignee in and to any moneys due or to become due to Contractor shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for performance of the Work called for in this Contract.

31. MUTUAL RESPONSIBILITY OF CONTRACTORS

A. If, through acts of neglect on part of Contractor or any subcontractor shall suffer loss or damage on the Work, Contractor agrees to settle with such subcontractor by agreement or arbitration if such other subcontractor will so settle. If such subcontractor shall assert any

claim against County on account of any damage alleged to have been sustained, Department shall notify Contractor, who shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives against any such claim.

32. SEPARATE CONTRACTS

A. Department may award other contracts for the Work and all Contractors shall fully cooperate with each other and carefully adjust their work to that provided under other contracts as may be directed by Department. No Contractor shall commit or permit any act that will interfere with performance of the Work by any other Contractor.

B. Contractor shall coordinate the Work with those of other Contractors. Cooperation will be required in arrangement for storage of materials and in detailed execution of the Work. Contractor, including subcontractors, shall keep informed of progress and detail work of others and shall notify Engineer or Department immediately of lack of progress or defective workmanship on part of others. Failure of Contractor to keep informed of the Work progressing on site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by Contractor of status of the Work as being satisfactory for proper coordination with Contractor's own work.

33. SUBCONTRACTS

A. Contractor may use services of specialty subcontractors on those parts of the Work that, under normal contracting practices, are performed by specialty subcontractors.

B. Contractor shall not award any work to any subcontractor without prior approval of Department. Qualifications of subcontractors shall be same as qualifications of Contractor. Request for subcontractor approval shall be submitted to Department fifteen (15) days before start of subcontractor's work. If subcontractors are changed or added, Contractor shall notify Department in writing.

C. Contractor shall be as fully responsible to County for acts and omissions of subcontractors, and of persons either directly or indirectly employed by them, as Contractor is for acts and omissions of persons directly employed by Contractor.

D. Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind subcontractors to Contractor by terms of General Conditions of Contract and other Construction Documents insofar as applicable to work of subcontractors and to give Contractor same power as regards terminating any subcontract that Department may exercise over Contractor under any provision of Construction Documents.

E. Nothing contained in this Contract shall create any contractual relation between any subcontractor and County.

F. Contractor shall insert in all subcontracts, Articles 26, 33, 43 and 45, respectively entitled: "Withholding of Payments", "Subcontracts", "Affirmative Action Provision and Minority / Women / Disadvantaged Business Enterprises", and "Minimum Wages", and shall further require all subcontractors to incorporate physically these same Articles in all subcontracts.

34. PUBLIC WORKS PROJECT ENGINEER'S AUTHORITY

A. Public Works Project Engineer shall:
   1. Administer and ensure compliance with Construction Documents;
   2. Provide responsible on-site observations of construction and have authority to request work and to stop work whenever necessary to insure proper enforcement of Construction Documents;
   3. Convene and chair project meetings and foreman's coordination meetings when necessary to coordinate resolution of conflicts between Contractors, Architects, Engineers, Consultants, and Department; and
   4. Check and inspect material, equipment and installation procedures of all trades for proper workmanship and for compliance with Drawings, Specifications and Shop Drawings, permit no material on project site that is not satisfactory and reject work not in compliance with Construction Documents.

35. ENGINEER'S AUTHORITY

A. Engineer is retained by, and is responsible to Department acting for County.

B. Engineer shall determine amount, quality, acceptability, and fitness of several kinds of work and materials that are provided under this Contract and shall decide all questions that may arise in relation to said work and construction thereof.

C. Engineer shall decide meaning and intent of any portion of Specifications and of any Drawings where they may be found obscure or be in dispute.

D. Engineer shall provide responsible observation of construction. Engineer has authority to stop the Work whenever such stoppage may be necessary to insure proper execution of Construction Documents.

E. Engineer shall be interpreter of conditions of Construction Documents and judge of its performance.

F. Within reasonable time, Engineer shall make decisions on all matters relating to progress of the Work or interpretation of Construction Documents.

G. Engineer's decisions are subject to review by Public Works Project Engineer.

36. STATED ALLOWANCES

A. Stated allowances enumerated in Instructions to Bidders shall cover net cost of materials or equipment, and all applicable taxes. Contractor's cost of delivery and unloading at site, handling costs on site, labor, installation costs, overhead, profit and any other incidental costs shall be included in Contractor's bid, but not as part of cash allowance.

B. Department will solicit at least two (2) bids on materials or equipment for which allowance is stated and select on basis of lowest qualified responsible bid. Contractor will then be instructed to purchase "Allowed Materials". If actual price for purchasing "Allowed Materials", including taxes, is more or less than "Cash Allowance", Contract price shall be adjusted accordingly. Adjustment in Contract price shall not contain any cost items excluded from cash allowance.

37. ESTIMATES OF QUANTITIES

A. Whenever estimated quantities of work to be done and materials to be furnished under this Contract are shown in any of Construction Documents, they are given for use in comparing bids and right is especially reserved to increase or diminish them as they may be deemed reasonably necessary or desirable by Department to complete the Work included in this Contract, and cost for such increase or diminution shall be adjusted in manner provided for in General Conditions of Contract Article 18 entitled "Changes in the Work".

38. LANDS AND RIGHTS-OF-WAY

A. Prior to start of construction, County shall furnish all land and rights-of-way necessary for carrying out and completion of the Work to be performed under this Contract.

39. GENERAL GUARANTEE

A. Neither final certificate of payment nor any provision in Construction Documents nor partial or entire occupancy of premises by County shall constitute acceptance of work not done in accordance with Construction Documents or relieve Contractor of liability in respect to any expressed warranties or responsibility for faulty materials or workmanship.
   1. In no event shall making of any payment required by Contract constitute or be construed as waiver by County of any breach of covenants of Contract or waiver of any default of Contractor and making of any such payment by County while any such default or breach shall exist shall in no way impair or prejudice right of County with respect to recovery of damages or other remedy as result of such breach or default.

B. Contractor shall remedy and make good all defective workmanship and materials and pay for any damage to other work resulting there from, which appear within period of one (1) year from date of substantial completion, providing such defects are not clearly due to abuse or misuse by County. Department will give notice of observed defects with reasonable promptness.

C. Guarantee on work executed after certified date of substantial completion will begin on date when such work is inspected and approved by Engineer and Public Works Project Engineer.

D. Where guarantees or warrantees are required in sections of Specifications for periods in excess of one (1) year, such longer terms shall apply; however, Contractor's Performance and Payment Bonds shall not apply to any guarantee or warranty period in excess of one (1) year.

40. CONFLICTING CONDITIONS

A. Any provision in any of Construction Documents which may be in conflict or inconsistent with any Articles in these General Conditions of Contract or Supplementary Conditions shall be void to extent of such conflict or inconsistency.

B. In case of ambiguity or conflict between Drawings and Specifications, Specifications shall govern.

C. Printed dimensions shall be followed in preference to measurements by scale. Large-scale drawings take precedence over small-scale drawings. Dimensions on Drawings and details are subject to field measurements of adjacent work.

41. NOTICE AND SERVICE THEREOF

A. Any notice to Contractor from Department relative to any part of this Contract shall be in writing and considered delivered and service thereof completed, when said notice is posted, by certified or registered mail, to Contractor at Contractor's last given address, or delivered in person to said Contractor, or Contractor's authorized representative on the Work.

42. PROTECTION OF LIVES AND HEALTH

A. In order to protect lives and health of Contractor's employees under Contract, Contractor shall comply with all pertinent provisions of Wisconsin Administrative Code, Rules of Department of Commerce, relating to Safety and Health.

B. Contractor alone shall be responsible for safety, efficiency and adequacy of Contractor's tools, equipment and methods, and for any damage that may result from their failure or their improper construction, maintenance or operation.

43. AFFIRMATIVE ACTION PROVISION AND MINORITY / WOMEN / DISADVANTAGED BUSINESS ENTERPRISES

A. Affirmative Action Provisions.
   1. During term of their Contract, Contractor agrees not to discriminate on basis of race, religion, color, sex, handicap, age, sexual preference, marital status, physical appearance, or national origin against any person, whether recipient of services (actual or potential), employee, or applicant for employment. Such equal opportunity shall include but not be limited to following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation or level of service(s). Contractor agrees to post in conspicuous places, these affirmative action standards so as to be visible to all employees, service recipients and applicants for this paragraph. Listing of prohibited bases for discrimination shall no be construed to amend in any fashion state or federal law setting forth additional bases and exceptions shall be permitted only to extent allowable in state or federal law.
   2. Contractor is subject to this Article only if Contractor has ten (10) or more employees and receives $10,000.00 or more in annual aggregate contracts with County. Contractor shall file and Affirmative Action Plan with Dane County Contract Compliance Officer in accord with Chapter 19 of Dane County Code of Ordinances. Such plan must be filed within fifteen (15) days of effective date of this Contract and failure to do so by said date shall constitute ground for immediate termination of Contract by County. Contractor shall also, during term of this Contract, provide copies of all announcements of employment opportunities to County's Contract Compliance Office, and shall report annually number of persons, by race, sex and handicap status, who apply for employment and, similarly classified, number hired and number rejected.
   3. Contact Dane County Contract Compliance Officer at Dane County Contract Compliance Office, 210 Martin Luther King, Jr. Blvd., Room 421, Madison, WI 53703, 608/266-4114.
   4. In all solicitations for employment placed on Contractor's behalf during term of this Contract, Contractor shall include statement to effect Contractor is "Equal Opportunity Employer". Contractor agrees to furnish all information and reports required by County's Contract Compliance Officer as same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance with Chapter 19, Dane County Code of Ordinances, and provision of this Contract.

B. Minority / Women / Disadvantaged / Emerging Small Business Enterprises.
   1. Chapter 19.508 of Dane County Code of Ordinances is official policy of Dane County regarding utilization of, to fullest extent of, Minority Business Enterprises (MBEs), Women Business Enterprises (WBEs) Disadvantage Business Enterprises (DBEs) and Emerging Small Business Enterprises (ESBEs).
   2. Contractor may utilize MBEs / WBEs / DBEs / ESBEs as subcontractors or suppliers. List of subcontractors will be required of low bidder as stated in this Contract. List shall indicate which are MBEs / WBEs / DBEs / ESBEs and percentage of subcontract awarded, shown as percentage of total dollar amount of bid.

44. COMPLIANCE WITH FAIR LABOR STANDARDS

A. During term of this Contract, Contractor shall report to County Contract Compliance Officer, within ten (10) days, any allegations to, or findings by National Labor Relations Board (NLRB) or Wisconsin Employment Relations Commission (WERC) that Contractor has violated statute or regulation regarding labor standards or relations. If investigation by Contract Compliance Officer results in final determination that matter adversely affects Contractor's responsibilities under this Contract, and which recommends termination, suspension or cancellation of this Contract, County may take such action.

B. Contractor may appeal any adverse finding by Contract Compliance Officer as set forth in Dane County Ordinance 25.015(11)(c) through (e).

C. Contractor shall post this statement in prominent place visible to employees: "As condition of receiving and maintaining contract with Dane County, this employer shall comply with federal, state and all other applicable laws prohibiting retaliation or union organizing."

45. DOMESTIC PARTNERSHIP BENEFITS

A. Contractor agrees to provide same economic benefits to all of its employees with domestic partners as it does to employees with spouses, or cash equivalent if such benefit cannot reasonably be provided. Contractor agrees to make available for County inspection Contractor's payroll records relating to employees providing services on or under this Contract or subcontract. If any payroll records of Contractor contain any false, misleading or fraudulent information, or if Contractor fails to comply with provisions of Chapter 25.016, Dane County Ordinances, contract compliance officer may withhold payments on Contract; terminate, cancel or suspend Contract in whole or in part; or, after due process hearing, deny Contractor right to participate in bidding on future County contracts for period of one year after first violation is found and for period of three years after second or subsequent violation is found.

46. USE AND OCCUPANCY PRIOR TO ACCEPTANCE

A. Contractor agrees to use and occupancy of portion or unit of the Work before formal acceptance by Department, provided Department:
   1. Secures written consent of Contractor; except when in opinion of Public Works Project Engineer, Contractor is chargeable with unwarranted delay in final cleanup of punch list items or other Contract requirements.
   2. Secures endorsement from insurance carrier and consent of Surety permitting occupancy of building or use of the Work during remaining period of construction, or, secures consent of Surety.
   3. Assumes all costs and maintenance of heat, electricity and water.

4. Accepts all work completed within that portion or unit of the Work to be occupied, at time of occupancy.

47. MINIMUM WAGES

A. Contractor shall post, at appropriate conspicuous point on site of project, schedule showing all determined minimum wage rates for various classes of laborers and mechanics to be engaged in the Work under this Contract and all deductions, if any, required by law to be made from unpaid wages actually earned by laborers and mechanics so engaged.

B. Supplementary Conditions section in Construction Documents lists wage determinations required by State Law.

C. If, after award of Contract, it becomes necessary to employ any person in trade or occupation not classified in wage determinations, such person shall be paid at not less than such rate as shall be determined by Wisconsin Department of Workforce Development. Such approved minimum rate shall be retroactive to time of initial employment of such person in such trade or occupation. Contractor shall notify Department of Contractor's intention to employ persons in trades or occupations not so classified in sufficient time for Department to obtain approved rates for such trades or occupations.

D. Specified wage rates are minimum rates only, and Department will not consider any claims for additional compensation made by Contractor because of payment by Contractor of any wage rate in excess of applicable rate contained in this Contract. Contractor shall adjust any disputes in regard to payment of wages in excess of those specified in this Contract.

E. Submit required affidavit(s) to Department of Public Works, Highway & Transportation, as requested and with final application for payment for work under said contract. Affidavit(s) shall clearly indicate name, trade or occupation, and paid wages of every laborer, workman or mechanic employed by Contractor and all subcontractors during billing period including accurate record of number of hours worked by each employee and actual wages paid as stipulated in Wisconsin Statue 66.0903. If Wisconsin Prevailing Wage Rate Determination is required for this Work, use "Prime Contractor Affidavit of Compliance With Prevailing Wage Rate Determination" and "Agent or Subcontractor Affidavit of Compliance With Prevailing Wage Rate Determination" (if applicable). If Wisconsin Prevailing Wage Rate Determination is not required for this Work, use "Dane County, Wisconsin Contractor Wage Affidavit". Forms of such affidavits are included in Supplementary Conditions.

48. CLAIMS

A. No claim may be made until Department's Associate Public Works Director has reviewed Engineer's decision as provided for in Article 35 of General Conditions of Contract. If any claim remains unresolved after such review by Department's Associate Public Works Director, claim may be filed under Wisconsin Statute 893.80. Work shall progress during period of any dispute or claim. Unless specifically agreed between parties, venue will be in Dane County, Wisconsin.

49. ANTITRUST AGREEMENT

A. Contractor and County recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by County. Therefore, Contractor hereby assigns to County any and all claims for such overcharges as to goods and materials purchased in

connection with this Contract, except as to overcharges which result from antitrust violations commencing after price is established under this Contract and any change order thereto.

50. INSURANCE

A. Contractor Carried Insurance:
   1. Contractor shall not commence work under this Contract until Contractor has obtained all insurance required under this Article and has provided evidence of such insurance to Risk Manager, 425 City-County Building, 210 Martin Luther King Jr. Blvd., Madison, WI 53703. Contractor shall not allow any subcontractor to commence work until insurance required of subcontractor has been so obtained and approved. Company providing insurance must be licensed to do business in Wisconsin.
   2. Worker's Compensation Insurance:
      a) Contractor shall procure and shall maintain during life of this Contract, Worker's Compensation Insurance as required by statute for all of Contractor's employees engaged in work at site of project under this Contract and, in case of any such work sublet, Contractor shall require subcontractor similarly to provide Worker's Compensation Insurance for all of latter's employees to be engaged in such work unless such employees are covered by protection afforded by Contractor's Worker's Compensation Insurance.
      b) If any claim of employees engaged in hazardous work on project under this Contract is not protected under Worker's Compensation Statute, Contractor shall provide and shall cause each subcontractor to provide adequate Employer's Liability Insurance for protection of such of Contractor's employees as are not otherwise protected.
   3. Contractor's Public Liability and Property Damage Insurance:
      a) Contractor shall procure and maintain during life of this Contract, Contractor's Public Liability Insurance and Contractor's Property Damage Insurance in amount not less than $1,000,000 bodily injury, including accidental death, to any one person, and subject to same limit for each person, in amount not less than $1,000,000 on account of one accident, and Contractor's Property Damage Insurance in amount not less then $1,000,000 or combined single limit of at least $1,000,000 with excess coverage over and above general liability in amount not less than $5,000,000. Contractor shall add "Dane County" as additional insured for each project.
      b) Contractor's Public Liability and Property Damage Insurance shall include Products, Completed Operation, and Contractual Liability under Insurance Contract. "Contractor shall in all instances save, defend, indemnify and hold harmless County and Engineer against all claims, demands, liabilities, damages or any other costs which may accrue in prosecution of the Work and that Contractor will save, defend, indemnify and hold harmless County and Engineer from all damages caused by or as result of Contractor's operations" and each shall be listed as additional insured on Contractor's and sub-contractors' insurance policies.
      c) Obligations of Contractor under Article 48.A.2)b) shall not extend to liability of Engineer, agents or employees thereof, arising out of:
         1) Preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications; or
         2) giving of or failure to give directions or instructions by Engineer, agents or employees thereof provided such giving or failure to give is primary cause of injury or damage.
      d) Contractor shall procure and shall maintain during life of this Contract, Comprehensive Automobile Liability Insurance covering owned, non-owned and hired automobiles for limits of not less than $1,000,000 each accident single limit, bodily injury and property damage combined with excess coverage over and above general liability in amount not less than $5,000,000.

e) Contractor shall either:
   1) Require each subcontractor to procure and to maintain during life of subcontract, subcontractor's Public Liability Property Damage Insurance, and Comprehensive Automobile Liability Insurance of type and in same amount specified in preceding paragraphs; or
   2) Insure activities of subcontractors in Contractor's own policy.

4. Scope of Insurance and Special Hazards: Insurance required under Article 48.A.2 hereof shall provide adequate protection for Contractor and subcontractors, respectively, against damage claims which may arise from operations under this Contract, whether such operation be by insured or by anyone directly or indirectly employed by insured and also against any of special hazards which may be encountered in performance of this Contract as enumerated in Supplementary Conditions.
5. Proof of Carriage of Insurance: Contractor shall furnish Risk Manager with certificates showing type, amount, class of operations covered, effective dates, dates of expiration of policies and "Dane County" listed as additional insured. Such certificates shall also contain (substantially) following statement: "Insurance covered by this certificate will not be canceled or materially altered, except after ten (10) days written notice has been received by Risk Manager."

B. Builder's Risk:
   1. County shall provide Builder's Risk policy. Terms of this policy will be made available by County's Risk Manager, upon Contractor's request. By executing this Contract, Contractor warrants it is familiar with terms of said policy.

C. Indemnification / Hold Harmless:
   1. Contractor shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from and against all claims, damages, losses and expenses including attorneys' fees arising out of or resulting from performance of the Work, provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, and is caused in whole or in part by any act or omission of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by part indemnified hereunder.
   2. In any and all claims against Dane County, its boards, commissions, agencies, officers, employees and representatives or by any employee of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, indemnification obligation under this Contract shall not be limited in any way by any limitation on amount or type of damages, compensation or benefits payable by or for Contractor or any subcontractor under worker's compensation acts, disability benefits or other employee benefit acts.
   3. Obligations of Contractor under this Contract shall not extend to liability of Engineer, its agents or employees arising out of:
      a) Preparation or approval of maps, drawings, opinion, reports, surveys, change orders, designs or specifications; or
      b) Giving of or failure to give directions or instruction by Engineer, its agents or employees provided such giving or failure to give is primary cause of injury or damage.
   4. Dane County shall not be liable to Contractor for damages or delays resulting from work by third parties or by injunctions or other restraining orders obtained by third parties.

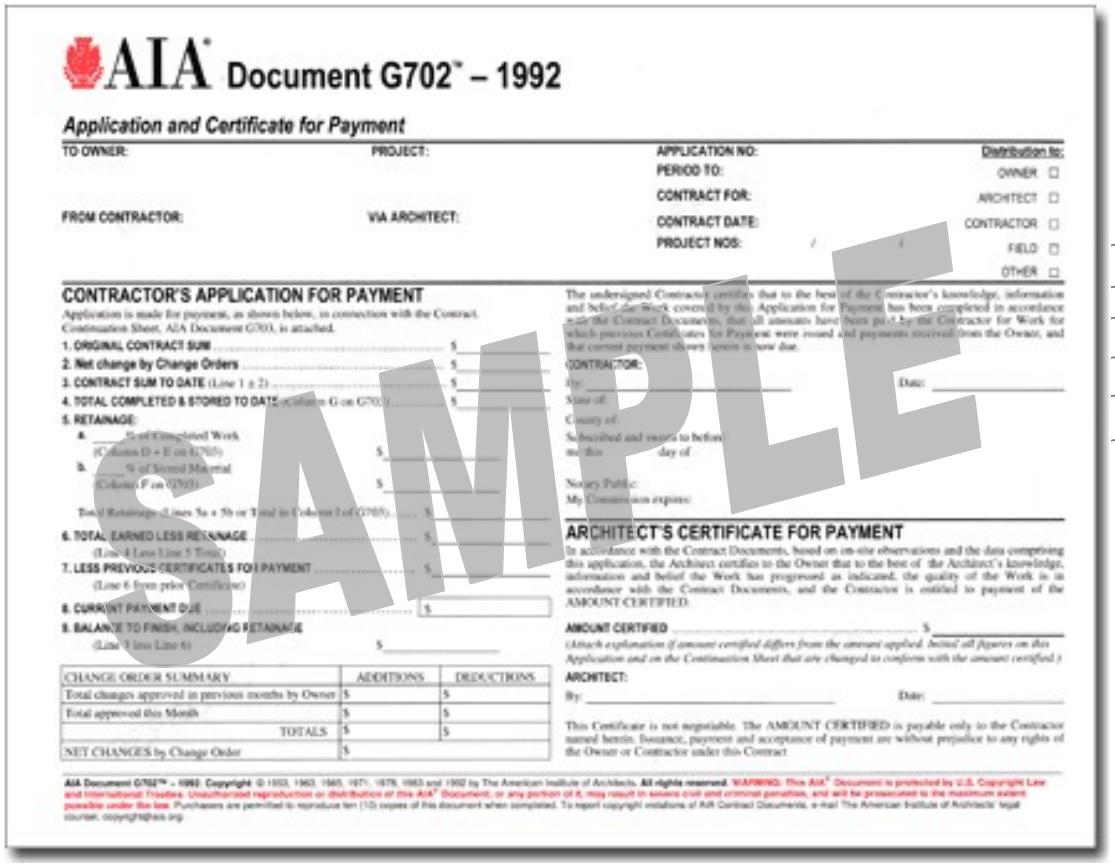
51. WISCONSIN LAW CONTROLLING

A. It is expressly understood and agreed to by parties hereto that in event of any disagreement or controversy between parties, Wisconsin law shall be controlling.

SUPPLEMENTARY CONDITIONS

1. APPLICATION & CERTIFICATE FOR PAYMENT

A. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit partial and final Application & Certificate for Payment for work under said contract. Form shall provide similar information as shown on AIA G702™ and G703™ forms (samples shown below). Forms shall be submitted to Project Engineer for approval.



AIA Document G702™ – 1992

Application and Certificate for Payment

TO OWNER: PROJECT: APPLICATION NO: Distribution to:
PERIOD TO: OWNER ☐
CONTRACT FOR: ARCHITECT ☐
FROM CONTRACTOR: VIA ARCHITECT: CONTRACT DATE: CONTRACTOR ☐
PROJECT NOS: / / FIELD ☐
OTHER ☐

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM ..... $
2. Net change by Change Orders ..... $
3. CONTRACT SUM TO DATE (Line 1 ± 2) ..... $
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703) ..... $
5. RETAINAGE:
   a. ____ % of Completed Work (Column D + E on G703) $
   b. ____ % of Stored Material (Column F on G703) $
   Total Retainage (Lines 5a + 5b or Total in Column I of G703) ..... $
6. TOTAL EARNED LESS RETAINAGE ..... $
   (Line 4 Less Line 5 Total)
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT ..... $
   (Line 6 from prior Certificate)
8. CURRENT PAYMENT DUE ..... $
9. BALANCE TO FINISH, INCLUDING RETAINAGE
   (Line 3 less Line 6) $

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$	$
Total approved this Month	$	$
TOTALS	$	$
NET CHANGES by Change Order	$	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:
By: Date:
State of:
County of:
Subscribed and sworn to before me this day of
Notary Public:
My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... $
(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:
By: Date:

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

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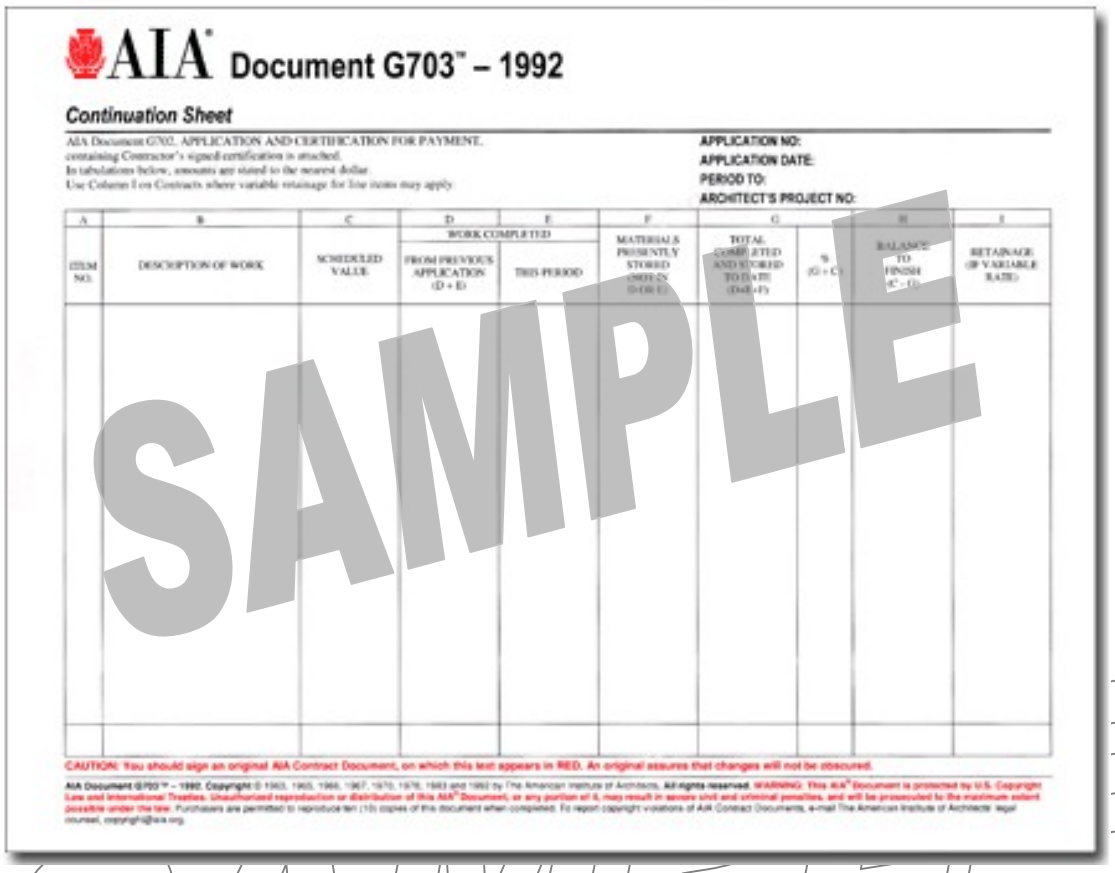

AIA Document G703™ – 1992

Continuation Sheet

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G	H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED: FROM PREVIOUS APPLICATION (D + E)	WORK COMPLETED: THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C – G)	RETAINAGE (IF VARIABLE RATE)

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

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2. DAVIS-BACON WAGE RATE DETERMINATION

A. These supplements shall modify, delete, and / or add to General Conditions of Contract. Where any article, paragraph, or subparagraph in General Conditions of Contract is supplemented by one of these paragraphs, provisions of such article, paragraph, or subparagraph shall remain in effect and supplementary provisions shall be considered as added thereto. Where any article, paragraph, or subparagraph in General Conditions of Contract is amended, voided, or superseded by any of these paragraphs, provisions of such article, paragraph, or subparagraph not so amended, voided, or superseded shall remain in effect.
   1. General Conditions of Contract Article 45, "Minimum Wages", paragraph B. Following Davis-Bacon Wage Rate Determination is added to General Conditions of Contract.

B. These Davis-Bacon forms, hereinafter set forth in this section, shall be filled out and submitted to Department of Public Works, Highway & Transportation:
   1. Certified Payroll Request (Form WH – 347), http://webapps.dol.gov/libraryforms/go-us-dol-form.asp?FormNumber=38
   2. Statement of Compliance

3. BUY AMERICAN PROVISIONS

A. The Buy American provision in the American Recovery and Reinvestment Act of 2009 (section 1605 of Title XVI), provides that, unless one of three listed exceptions applies (nonavailability, unreasonable cost, and inconsistent with the public interest), and a waiver is granted, none of the funds appropriated or otherwise made available by the Act may be used

for a project for the construction, alteration, maintenance, or repair of a public building or public work unless all the iron, steel, and manufactured goods used are produced in the United States.

B. To certify that a manufactured good meets the Buy American Act Requirements, fill out and submit the following Buy American Affidavit to Department of Public Works, Highway & Transportation. The Buy American Standards are further outlined in the ARRA Reporting Requirements section in Attachment A-2.

GENERAL DECISION: WI20100005 09/03/2010 WI5

Date: September 3, 2010
General Decision Number: WI20100005 09/03/2010

Superseded General Decision Number: WI20080005

State: Wisconsin

Construction Type: Building

County: Dane County in Wisconsin.

BUILDING CONSTRUCTION PROJECTS (does not include residential construction consisting of single family homes and apartments up to and including 4 stories)

Modification Number	Publication Date
0	03/12/2010
1	04/02/2010
2	06/04/2010
3	07/02/2010
4	08/06/2010
5	08/13/2010
6	09/03/2010

ASBE0205-001 06/01/2001

	Rates	Fringes
Asbestos Removal worker/hazardous material handler Includes preparation, wetting, stripping, removal, scrapping, vacuuming, bagging and disposing of all insulation materials from mechanical systems, whether they contain asbestos or not	$ 17.90	4.45

BOIL0107-001 07/01/2009

	Rates	Fringes
BOILERMAKER		
Boilermaker	$ 33.64	19.27
Small Boiler Repair (under 25,000 lbs/hr)	$ 26.91	16.00

BRWI0013-001 06/01/2009

	Rates	Fringes
BRICKLAYER		
Bricklayer	$ 31.46	15.15
Terrazzo Finisher	$ 25.73	13.45
Terrazzo Worker	$ 32.16	13.45
Tile Finisher	$ 22.93	13.45
Tile Layer	$ 28.66	13.45

CARP0252-007 06/01/2010

	Rates	Fringes
CARPENTER (Including Acoustical work and Drywall hanging; Excluding Batt Insulation)		
CARPENTER & SOFT FLOOR LAYER	$ 30.56	13.36
MILLWRIGHT	$ 32.16	13.36
PILEDRIVERMAN	$ 31.06	13.36

ELEC0014-005 06/04/2007

	Rates	Fringes
Teledata System Installer		
Installer/Technician	$ 20.69	17%+6.65

Low voltage construction, installation, maintenance and removal of teledata facilities (voice, data, and video) including outside plant, telephone and data inside wire, interconnect, terminal equipment, central offices, PABX, fiber optic cable and equipment, micro waves, V-SAT, bypass, CATV, WAN (wide area networks), LAN (local area networks), and ISDN (integrated systems digital network).

ELEC0159-002 06/01/2009

	Rates	Fringes
ELECTRICIAN	$ 31.61	28%+8.95

ELEV0132-001 01/01/2009

	Rates	Fringes
ELEVATOR MECHANIC	$ 41.31	18.285

FOOTNOTE:
PAID VACATION: Employer contributes 8% of basic hourly rate as vacation pay for employees with more than 5 years or more of service, and 6% for less than 5 years of service.
PAID HOLIDAYS: New Years Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Friday after Thanksgiving, and Christmas Day.

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* ENGI0139-002 06/01/2010

	Rates	Fringes
OPERATOR: Power Equipment		
Group 1	$ 34.62	17.75
Group 2	$ 33.62	17.75
Group 3	$ 32.42	17.75
Group 4	$ 31.89	17.75
Group 5	$ 29.82	17.75
Group 6	$ 29.19	17.75

HAZARDOUS WASTE PREMIUMS:

EPA Level "A" Protection: $3.00 per hour
EPA Level "B" Protection: $2.00 per hour
EPA Level "C" Protection: $1.00 per hour

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Cranes, Tower Cranes and Derricks with or without attachments with a lifting capacity of over 100 tons; Cranes, Tower Cranes, and Derricks with boom, leads and/or jib lengths 176 ft or longer.

GROUP 2: Backhoes (Excavators) weighing 130,000 lbs & over; Cranes, Tower Cranes and Derricks with or without attachments with a lifting capacity of 100 tons or less; Cranes, Tower Cranes, and Derricks with boom, leads, and/or jib lengths 175 ft or less; Caisson Rigs; Pile Driver

GROUP 3: Backhoes (Excavators) weighing under 130,000 lbs; Travelling Crane (bridge type); Milling Machine; Concrete Paver over 27 E; Concrete Spreader and Distributor; Concrete Laser Screed; Concrete Grinder and Planing Machine; Slipform Curb and Gutter Machine; Boring Machine (Directional); Dredge Operator; Skid Rigs; Over 46 meter Concrete Pump.

GROUP 4: Hydraulic Backhoe (tractor or truck mounted); Hydraulic Crane, 10 tons or less; Tractor, Bulldozer, or End Loader (over 40 hp); Motor Patrol; Scraper Operator; Bituminous Plant and Paver Operator; Screed-Milling Machine; Roller over 5 tons; Concrete Pumps 46 meter & under; Grout Pumps; Rotec Type Machine; Hydro Blaster, 10,000 psi and over; Rotary Drill Operator; Percussion Drilling Machine; Air Track Drill with or without integral hammer; Blaster; Boring Machine (vertical or horizontal); Side Boom; Trencher, wheel type or chain type having 8 inch or larger bucket; Rail Leveling Machine (Railroad); Tie Placer; Tie Extractor; Tie Tamper; Stone Leveler; Straddle Carrier; Material Hoists; Stack Hoist; Man Hoists; Mechanic and Welder; Off Road Maaerial Haulers

GROUP 5: Tractor, Bulldozer, or Endloader (under 40 hp); Tampers -Compactors, riding type; Stump Chipper, large; Roller, Rubber Tire; Backfiller; Trencher, chain type (bucket under 8 inch); Concrete Auto Breaker, large; Concrete Finishing Machine (road type); Concrete Batch Hopper; Concrete Conveyor Systems; Concrete Mixers, 14S or over; Pumps, Screw Type and Gypsum); Hydrohammers, small; Brooms and Sweeeprs; Lift Slab Machine; Roller under 5 tons; Industrial Locomotives; Fireman (Pile Drivers and Derricks); Pumps (well points); Hoists, automatic; A-Frames and Winch Trucks; Hoists (tuggers); Boats (Tug, Safety, Work Barges and Launches); Assistant Engineer

GROUP 6: Shouldering Machine Operator; Farm or Industrial Tractor mounted equipment; Post Hole Digger; Auger (vertical and horizontal); Skid Steer Loader with or without attachments; Robotic Tool Carrier with or without attachments; Power Pack Vibratory/Ultra Sound Driver and Extractor; Fireman (Asphalt Plants); Screed Operator; Stone Crushers and Screening Plants; Air, Electric, Hydraulic Jacks (Slip Form); Prestress Machines; Air Compressor, 400 CFM or over; Refrigeration Plant/Freese Machine; Boiler Operators (temporary heat); Forklifts; Welding Machines;

Generators; Pumps over 3"; Compressors, under 400 CFM; Heaters, Mechanical; Combination small equipment operator; Winches, small electric; Oiler; Greaser; Rotary Drill Tender; Conveyor; Elevator Operator

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IRON0383-002 06/01/2010

	Rates	Fringes
IRONWORKER	$ 30.90	19.13

LABO0464-001 06/01/2009

	Rates	Fringes
Laborer: Asbestos/hazardous material remover (Preparation, removal, and encapsulation of hazardous materials from non-mechanical systems)	$ 23.06	12.38
Laborers: (Excluding Blown Insulation; Including General Laborer, Carpenter Tender, Bottom Man, Brick Mason Tender, Cement Mason Tender, Formsetter, Pipelayer, Shoveler)	$ 22.59	11.73

PAIN0802-001 06/01/2009

	Rates	Fringes
PAINTER		
Brush, Roller	$ 25.65	13.10

PREMIUM RATES [Add to Basic Hourly Rate]

Swing Work	$0.25
Drywall Taper	$0.30
Paperhanger	$0.40
Steel, Spray	$1.00

PAIN0941-001 06/01/2010

	Rates	Fringes
GLAZIER	$ 36.28	11.17

PLAS0599-001 06/01/2008

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 29.78	13.38
PLASTERER	$ 25.28	12.91

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* PLUM0075-007 07/01/2010

	Rates	Fringes
PLUMBER (Including HVAC work)	$ 35.78	14.76

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* PLUM0601-007 07/12/2010

	Rates	Fringes
PIPEFITTER (Including HVAC work)	$ 38.05	15.49

SFWI0669-002 04/01/2010

	Rates	Fringes
SPRINKLER FITTER	$ 36.39	16.60

SHEE0018-009 06/01/2010

	Rates	Fringes
Sheet Metal Worker (Including HVAC Duct work and Technicians)	$ 33.23	19.57

SUWI2002-011 01/23/2002

	Rates	Fringes
Asbestos Worker/Heat and Frost Insulator	$ 25.36	8.37
Laborers:		
Concrete Worker	$ 16.34	3.59
Landscape	$ 8.73	4.90
ROOFER, Including Built Up, Composition and Single Ply Roofs	$ 18.01	3.28
Tile & Marble Finisher	$ 13.89	7.58

TEAM0039-004 05/01/2009

	Rates	Fringes
TRUCK DRIVER		
1 & 2 Axles	$ 23.84	14.70
3 or more Axles	$ 23.99	14.70

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

DANE COUNTY, WISCONSIN

BUY AMERICAN AFFIDAVIT

COMPANY NAME: _____

ADDRESS: _____

_____

CONTRACT NO.: _____ DIVISION(S) OF WORK: _____

AFFIDAVIT

STATE OF WISCONSIN)
) ss.
DANE COUNTY)

I, _____, being
name and title of person signing affidavit
first duly sworn at _____,
city & state of company incorporation
on oath, depose and say that with respect to the Buy American requirement have used American, Steel, and Manufactured Goods as required under Section 1605 of the American Recovery and Reinvestment ACT of 2009
by the

_____, subcontractors on the _____
contractor company name division(s) of work
_____, at the _____
building or site of project
that during the period commencing _____, and ending _____

Product(s) Description: (If necessary add attachment)

Item or product	Manufacture	Specification Section

_____
Print Name

_____ _____
Signature Title

Sworn to before me this ___ day of _____, 20__.

_____ My Commission expires _____
Notary Public Date

ARRA Reporting Requirements

Period of Performance:

This contract becomes effective on the date it is signed by the Dane County Executive.

An acknowledgment of Federal support and a disclaimer must appear in the publication of any material, whether copyrighted or not, based on or developed under this project, as follows:

Acknowledgment: "This material is based upon work supported by the Department of Energy under Award Number *DE-EE0000842*."

Disclaimer: "This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof."

Reporting Requirements:

The American Recovery and Reinvestment Act require that the public be informed of how money is used for economic recovery. The law ensures accountability and transparency through a number of reporting requirements. Under the guidelines in the law, **The Contractor** will be required to:

- Report on the use of recovery funds in Wisconsin for this program;
- Ensure the funds are used appropriately as defined by the law;
- Provide the number of jobs that were created or saved by the funds.

The Contractor is responsible for supplying all required monthly and quarterly reporting for Contractor's work and for all sub-contractors' work.

Reporting requirements detailed below are subject to changes by U.S. DOE throughout the period of performance. Compliance with any changes to reporting is required.

MONTLHY:

The Contractor is required to submit to Dane County on the third of each month;

1. Information on vendors utilized (including, amount paid, complete address, DUNS and CCR identifiers); and
2. Metric Activities:
    a. Energy Cost Savings
    b. Renewable Energy Capacity and Generation
    c. Job Creation/retained the prior month, as a direct result of ARRA funding.
    d. Energy Savings
    e. Emissions and Green House Gas Reductions
3. Prior monthly expenditures staff hours, and infrastructure requirements
4. Number of Public Buildings Retrofit
5. Square FT of Retrofit Work Completed
6. Number of Renewable Energy Systems installed
7. Capacity of Renewable Energy Systems Installed

ARRA Reporting Requirements

QUARTERLY:

The Contractor is required to submit quarterly reports via the following timeline, until December 31, 2013.

Reporting Period	Report Due
January 1st – March 31st	April 3rd
April 1st – June 30th	July 3rd
July 1st –September 30th	October 3rd
October 1st – December 31st	January 3rd

Reports should contain information specific to each activity in the program, as well as each infrastructure project, if applicable. Specifically, the report should contain the following information:

1. Project Development/Status Information
2. Quarterly Activities/Project Description
3. Metric Activities:
   a. Energy Cost Savings
   b. Renewable Energy Capacity and Generation
   c. Job Creation
   d. Energy Savings
   e. Emissions and Green House Gas Reductions
4. Major activities, significant results, major findings, and key outcomes.
5. Are you following the Plan? If not, describe the change in approach, and reasons for the change.
6. Actual or anticipated problems or delays and corrective action plan.
7. Products produced or technology transfer activities accomplished during the reporting period.
8. What you planned to accomplish this period.
9. Efficiency improvements (behavioral, simple adjustments)
10. Economic improvements
11. Environmental benefits achieved as a result of this program
12. Promotions and public education activities
13. Training activities
14. Lessons learned and continuous improvement efforts
15. If applicable, provide a listing of the manufacturers of the equipment purchased to perform activities funded by the Energy Efficiency Block Grant Program, in compliance with the Buy American (see Attachment A-2) requirements; and
16. If applicable, provide written assurance (i.e. payroll records) that all construction, laborers and mechanics on projects funded directly or assisted in whole or in part by and through this program are paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by the Davis-Bacon Act (see attachments A-3).
17. Contractor will use WasteCap for waste reuse and recycling. (see SECTION 01 74 19)

ARRA Reporting Requirements

SPECIAL STATUS REPORTS:

A report is required (via email), as soon as possible, after any of the following events occur:

1. Developments that have a significant favorable impact on the project.
2. Problems, delays, or adverse conditions which materially impair the ability to meet the objectives of the award or which may require the Dane County or the U.S. DOE to respond to questions relating to such events from the public. Report on any of the following incidents and include the anticipated impact and remedial action to be taken to correct or resolve the problem/condition:
    a. Any single fatality or injuries requiring hospitalization of five or more individuals.
    b. Any significant environmental permit violation.
    c. Any verbal or written Notice of Violation of any Environmental, Safety, and Health statutes.
    d. Any incident which causes a significant process or hazard control system failure.
    e. Any event which is anticipated to cause a significant schedule slippage or cost increase.
    f. Any damage to Government-owned equipment in excess of $50,000.
    g. Any other incident that has the potential for high visibility in the media.

FINAL REPORT:

Provide all information for a final report that is due 60 days after the contract terminates.

ATTACHMENT A-1

SPECIAL PROVISIONS RELATING TO WORK FUNDED UNDER AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009

Preamble

The American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, (Recovery Act) was enacted to preserve and create jobs and promote economic recovery, assist those most impacted by the recession, provide investments needed to increase economic efficiency by spurring technological advances in science and health, invest in transportation, environmental protection, and other infrastructure that will provide long-term economic benefits, stabilize State and local government budgets, in order to minimize and avoid reductions in essential services and counterproductive State and local tax increases. Recipients shall use grant funds in a manner that maximizes job creation and economic benefit.

The Recipient shall comply with all terms and conditions in the Recovery Act relating generally to governance, accountability, transparency, data collection and resources as specified in Act itself and as discussed below.

Recipients should begin planning activities for obtaining a DUNS number (or updating the existing DUNS record), and registering with the Central Contractor Registration (CCR).

Be advised that Recovery Act funds can be used in conjunction with other funding as necessary to complete projects, but tracking and reporting must be separate to meet the reporting requirements of the Recovery Act and related guidance. For projects funded by sources other than the Recovery Act, Contractors must keep separate records for Recovery Act funds and to ensure those records comply with the requirements of the Act.

The Government has not fully developed the implementing instructions of the Recovery Act, particularly concerning specific procedural requirements for the new reporting requirements. The Recipient will be provided these details as they become available. The Recipient must comply with all requirements of the Act. If the recipient believes there is any inconsistency between ARRA requirements and current award terms and conditions, the issues will be referred to the Contracting Officer for reconciliation.

Definitions

For purposes of this clause, Covered Funds means funds expended or obligated from appropriations under the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5. Covered Funds will have special accounting codes and will be identified as Recovery Act funds in the grant, cooperative agreement or TIA and/or modification using Recovery Act funds. Covered Funds must be reimbursed by September 30, 2015.

Non-Federal employer means any employer with respect to covered funds – the contractor, subcontractor, grantee, or recipient, as the case may be, if the contractor, subcontractor, grantee, or recipient is an employer; and any professional membership organization, certification of other professional body, any agent or licensee of the Federal government, or any person acting directly or indirectly in the interest of an employer receiving covered funds; or with respect to covered funds received by a State or local government, the State or local government receiving the funds and any contractor or subcontractor receiving the funds and any contractor or subcontractor of the State or local government; and does not mean any department, agency, or other entity of the federal government.

Recipient means any entity that receives Recovery Act funds directly from the Federal government (including Recovery Act funds received through grant, loan, or contract) other than an individual and includes a State that receives Recovery Act Funds.

A. Flow Down Requirement

As required by the US Department of Energy, the Office of Energy Independence must include these special terms and conditions in any sub-recipient. All sub-recipients are held to the following special provisions and requirements as the main recipient.

b. Segregation of Costs

Recipients must segregate the obligations and expenditures related to funding under the Recovery Act. Financial and accounting systems should be revised as necessary to segregate, track and maintain these funds apart and separate from other revenue streams. No part of the funds from the Recovery Act shall be commingled with any other funds or used for a purpose other than that of making payments for costs allowable for Recovery Act projects.

C. Prohibition on Use of Funds

None of the funds provided under this agreement derived from the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, may be used by any State or local government, or any private entity, for any casino or other gambling establishment, aquarium, zoo, golf course, or swimming pool.

D. Access to Records

With respect to each financial assistance agreement awarded utilizing at least some of the funds appropriated or otherwise made available by the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, any representative of an appropriate inspector general appointed under section 3 or 8G of the Inspector General Act of 1988 (5 U.S.C. App.) or of the Comptroller General is authorized –

(1) to examine any records of the contractor or grantee, any of its subcontractors or subgrantees, or any State or local agency administering such contract that

pertain to, and involve transactions relation to, the subcontract, subcontract, grant, or subgrant; and
(2) to interview any officer or employee of the contractor, grantee, subgrantee, or agency regarding such transactions.

E. Publication

An application may contain technical data and other data, including trade secrets and/or privileged or confidential information, which the applicant does not want disclosed to the public or used by the Government for any purpose other than the application. To protect such data, the applicant should specifically identify each page including each line or paragraph thereof containing the data to be protected and mark the cover sheet of the application with the following Notice as well as referring to the Notice on each page to which the Notice applies:

Notice of Restriction on Disclosure and Use of Data

The data contained in pages ---- of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data here to the extent provided in the award. This restriction does not limit the Government's right to use or disclose data obtained without restriction from any source, including the applicant.

Information about this agreement will be published on the Internet and linked to the website www.recovery.gov, maintained by the Accountability and Transparency Board. The Board may exclude posting contractual or other information on the website on a case-by-case basis when necessary to protect national security or to protect information that is not subject to disclosure under sections 552 and 552a of title 5, United States Code.

F. Protecting State and Local Government and Contractor Whistleblowers.

The requirements of Section 1553 of the Act are summarized below. They include, but are not limited to:

Prohibition on Reprisals: An employee of any non-Federal employer receiving covered funds under the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, may not be discharged, demoted, or otherwise discriminated against as a reprisal for disclosing, including a disclosure made in the ordinary course of an employee's duties, to the Accountability and Transparency Board, an inspector general, the Comptroller General, a member of Congress, a State or Federal regulatory or law enforcement agency, a person with supervisory authority over the employee (or other person working for the employer who has the authority to investigate, discover or terminate misconduct, a court or grant jury, the head of a Federal agency, or their representatives information that the employee believes is evidence of:

- gross management of an agency contract or grant relating to covered funds;
- a gross waste of covered funds
- a substantial and specific danger to public health or safety related to the

implementation or use of covered funds;
• an abuse of authority related to the implementation or use of covered funds; or
• as violation of law, rule, or regulation related to an agency contract (including the competition for or negotiation of a contract) or grant, awarded or issued relating to covered funds.

Agency Action: Not later than 30 days after receiving an inspector general report of an alleged reprisal, the head of the agency shall determine whether there is sufficient basis to conclude that the non-Federal employer has subjected the employee to a prohibited reprisal. The agency shall either issue an order denying relief in whole or in part or shall take one or more of the following actions:

• Order the employer to take affirmative action to abate the reprisal.
• Order the employer to reinstate the person to the position that the person held before the reprisal, together with compensation including back pay, compensatory damages, employment benefits, and other terms and conditions of employment that would apply to the person in that position if the reprisal had not been taken.
• Order the employer to pay the employee an amount equal to the aggregate amount of all costs and expenses (including attorneys' fees and expert witnesses' fees) that were reasonably incurred by the employee for or in connection with, bringing the complaint regarding the reprisal, as determined by the head of a court of competent jurisdiction.

Nonenforceablity of Certain Provisions Waiving Rights and remedies or Requiring Arbitration: Except as provided in a collective bargaining agreement, the rights and remedies provided to aggrieved employees by this section may not be waived by any agreement, policy, form, or condition of employment, including any predispute arbitration agreement. No predispute arbitration agreement shall be valid or enforceable if it requires arbitration of a dispute arising out of this section.

Requirement to Post Notice of Rights and Remedies: Any employer receiving covered funds under the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, shall post notice of the rights and remedies as required therein. (Refer to section 1553 of the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, www.Recovery.gov, for specific requirements of this section and prescribed language for the notices.).

G. RESERVED.

H. False Claims Act

Recipient and sub-recipients shall promptly refer to the DOE or other appropriate Inspector General any credible evidence that a principal, employee, agent, contractor, sub-grantee, subcontractor or other person has submitted a false claim under the False Claims Act or has committed a criminal or civil violation of laws pertaining to fraud, conflict or interest, bribery, gratuity or similar misconduct involving those funds.

ARRA Reporting Requirements

I. Information in supporting of Recovery Act Reporting

Recipient may be required to submit backup documentation for expenditures of funds under the Recovery Act including such items as timecards and invoices. Recipient shall provide copies of backup documentation at the request of the Contracting Officer or designee.

ATTACHMENT A-2

REQUIRED USE OF AMERICAN IRON, STEEL, AND MANUFACTURED GOODS -- SECTION 1605 OF THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009

(a) Definitions. As used in this award term and condition--

(1) Manufactured good means a good brought to the construction site for incorporation into the building or work that has been--

(i) Processed into a specific form and shape; or

(ii) Combined with other raw material to create a material that has different properties than the properties of the individual raw materials.

(2) Public building and public work means a public building of, and a public work of, a governmental entity (the United States; the District of Columbia; commonwealths, territories, and minor outlying islands of the United States; State and local governments; and multi-State, regional, or interstate entities which have governmental functions). These buildings and works may include, without limitation, bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, power lines, pumping stations, heavy generators, railways, airports, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, and canals, and the construction, alteration, maintenance, or repair of such buildings and works.

(3) Steel means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements.

(b) Domestic preference.

(1) This award term and condition implements Section 1605 of the American Recovery and Reinvestment Act of 2009 (Recovery Act) (Pub. L. 111--5), by requiring that all iron, steel, and manufactured goods used in the project are produced in the United States except as provided in paragraph (b)(3) and (b)(4) of this section and condition.

(2) This requirement does not apply to the material listed by the Federal Government as follows: none

(3) The award official may add other iron, steel, and/or manufactured goods to the list in paragraph (b)(2) of this section and condition if the Federal Government determines that--

(i) The cost of the domestic iron, steel, and/or manufactured goods would be unreasonable. The cost of domestic iron, steel, or manufactured goods used in the project is unreasonable when the cumulative cost of such material will increase the cost of the overall project by more than 25 percent;

(ii) The iron, steel, and/or manufactured good is not produced, or manufactured in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or

(iii) The application of the restriction of section 1605 of the Recovery Act would be inconsistent with the public interest.

(c) Request for determination of inapplicability of Section 1605 of the Recovery Act .
(1)(i) Any recipient request to use foreign iron, steel, and/or manufactured goods in accordance with paragraph (b)(3) of this section shall include adequate information for Federal Government evaluation of the request, including--

(A) A description of the foreign and domestic iron, steel, and/or manufactured goods;

(B) Unit of measure;

(C) Quantity;

(D) Cost;

(E) Time of delivery or availability;

(F) Location of the project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign iron, steel, and/or manufactured goods cited in accordance with paragraph (b)(3) of this section.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed cost comparison table in the format in paragraph (d) of this section.

(iii) The cost of iron, steel, and/or manufactured goods material shall include all delivery costs to the construction site and any applicable duty.

(iv) Any recipient request for a determination submitted after Recovery Act funds have been obligated for a project for construction, alteration, maintenance, or repair shall explain why the recipient could not

reasonably foresee the need for such determination and could not have requested the determination before the funds were obligated. If the recipient does not submit a satisfactory explanation, the award official need not make a determination.

(2) If the Federal Government determines after funds have been obligated for a project for construction, alteration, maintenance, or repair that an exception to section 1605 of the Recovery Act applies, the award official will amend the award to allow use of the foreign iron, steel, and/or relevant manufactured goods. When

the basis for the exception is nonavailability or public interest, the amended award shall reflect adjustment of the award amount, redistribution of budgeted funds, and/or other actions taken to cover costs associated with acquiring or using the foreign iron, steel, and/or relevant manufactured goods. When the basis for the exception is the unreasonable cost of the domestic iron, steel, or manufactured goods, the award official shall adjust the award amount or redistribute budgeted funds by at least the differential established in 2 CFR 176.110(a).

(3) Unless the Federal Government determines that an exception to section 1605 of the Recovery Act applies, use of foreign iron, steel, and/or manufactured goods is noncompliant with section 1605 of the American Recovery and Reinvestment Act.

(d) Data. To permit evaluation of requests under paragraph (b) of this section based on unreasonable cost, the Recipient shall include the following information and any applicable supporting data based on the survey of suppliers:

Foreign and Domestic Items Cost Comparison

Description	Unit of measure	Quantity	Cost(dollars)*
Item 1:			
Foreign steel, iron, or manufactured good	_____	_____	_____
Domestic steel, iron, or manufactured good	_____	_____	_____
Item 2:			
Foreign steel, iron, or manufactured good	_____	_____	_____
Domestic steel, iron, or manufactured good	_____	_____	_____

[List name, address, telephone number, email address, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.] [Include other applicable supporting information.] [*Include all delivery costs to the construction site.]

ATTACHMENT A-3

DAVIS BACON ACT AND CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

WAGE RATE REQUIREMENTS UNDER SECTION 1606 OF THE RECOVERY ACT

(a) Section 1606 of the Recovery Act requires that all laborers and mechanics employed by contractors and subcontractors on projects funded directly by or assisted in whole or in part by and through the Federal Government pursuant to the Recovery Act shall be paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by the Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code.

Pursuant to Reorganization Plan No. 14 and the Copeland Act, 40 U.S.C. 3145, the Department of Labor has issued regulations at 29 CFR parts 1, 3, and 5 to implement the Davis-Bacon and related Acts. Regulations in 29 CFR 5.5 instruct agencies concerning application of the standard Davis-Bacon contract clauses set forth in that section. Federal agencies providing grants, cooperative agreements, and loans under the Recovery Act shall ensure that the standard Davis-Bacon contract clauses found in 29 CFR 5.5(a) are incorporated in any resultant covered contracts that are in excess of $2,000 for construction, alteration or repair (including painting and decorating).

(b) For additional guidance on the wage rate requirements of section 1606, contact your awarding agency. Recipients of grants, cooperative agreements and loans should direct their initial inquiries concerning the application of Davis-Bacon requirements to a particular federally assisted project to the Federal agency funding the project. The Secretary of Labor retains final coverage authority under Reorganization Plan Number 14.

Definitions: For purposes of this article, Davis Bacon Act and Contract Work Hours and Safety Standards Act, the following definitions are applicable:

> (1) “Award” means any grant, cooperative agreement or technology investment agreement made with Recovery Act funds by the Department of Energy (DOE) to a Recipient. Such Award must require compliance with the labor standards clauses and wage rate requirements of the Davis-Bacon Act (DBA) for work performed by all laborers and mechanics employed by Recipients (other than a unit of State or local government whose own employees perform the construction) Subrecipients, Contractors and subcontractors.
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> (2) “Contractor” means an entity that enters into a Contract. For purposes of these clauses, Contractor shall include (as applicable) prime contractors, Recipients, Subrecipients, and Recipients’ or Subrecipients’ contractors, subcontractors, and lower-tier subcontractors. “Contractor” does not mean a unit of State or local government where construction is performed by its own employees.”

(3) “Contract” means a contract executed by a Recipient, Subrecipient, prime contractor or any tier subcontractor for construction, alteration, or repair. It may also mean (as applicable) (i) financial assistance instruments such as grants, cooperative agreements, technology investment agreements, and loans; and, (ii)

Sub awards, contracts and subcontracts issued under financial assistance agreements. “Contract” does not mean a financial assistance instrument with a unit of State or local government where construction is performed by its own employees.

(4) “Contracting Officer” means the DOE official authorized to execute an Award on behalf of DOE and who is responsible for the business management and non-program aspects of the financial assistance process.

(5) “Recipient” means any entity other than an individual that receives an Award of Federal funds in the form of a grant, cooperative agreement or technology investment agreement directly from the Federal Government and is financially accountable for the use of any DOE funds or property, and is legally responsible for carrying out the terms and conditions of the program and Award.

(6) “Subaward” means an award of financial assistance in the form of money, or property in lieu of money, made under an award by a Recipient to an eligible Subrecipient or by a Subrecipient to a lower- tier subrecipient. The term includes financial assistance when provided by any legal agreement, even if the agreement is called a contract, but does not include the Recipient’s procurement of goods and services to carry out the program nor does it include any form of assistance which is excluded from the definition of “Award” above.

(7) “Subrecipient” means a non-Federal entity that expends Federal funds received from a Recipient to carry out a Federal program, but does not include an individual that is a beneficiary of such a program.

(a) Davis Bacon Act

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may

be alleged to exist between the Contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section;

also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(A) The Contracting Officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the Contract shall be classified in conformance with the wage determination. The Contracting Officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the Contracting Officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the Contracting Officer to the Administrator of the Wage and Hour

Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of

receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(C) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and the Contracting Officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the Contracting Officer shall refer the questions, including the views of all interested parties and the recommendation of the Contracting Officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this Contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the Contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided,* That the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. The Department of Energy or the Recipient or Subrecipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this Contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and

mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the Contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the Contract, the Department of Energy, Recipient, or Subrecipient, may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as

may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii) (A) The Contractor shall submit weekly for each week in which any Contract work is performed a copy of all payrolls to the Department of Energy if the agency is a party to the Contract, but if the agency is not such a party, the Contractor will submit the payrolls to the Recipient or Subrecipient (as applicable), applicant, sponsor, or owner, as the case may be, for transmission to the Department of Energy. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on

weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional

Form WH-347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime Contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall

maintain the full social security number and current address of each covered worker, and shall provide them upon request to the Department of Energy if the agency is a party to the Contract, but if the agency is not such a party, the Contractor will submit them to the Recipient or Subrecipient (as applicable), applicant, sponsor, or owner, as the case may be, for transmission to the Department of Energy, the Contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the Recipient or Subrecipient (as applicable), applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the Contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the Contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for

the classification of work performed, as specified in the applicable wage determination incorporated into the Contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 3729 of title 31 of the United States Code.

(iii) The Contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the Department of Energy or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees--

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not

less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the

applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the

Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize

trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended and 29 CFR part 30.

(5) Compliance with Copeland Act requirements. The Contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this Contract.

(6) Contracts and Subcontracts. The Recipient, Subrecipient, the Recipient's and Subrecipient's contractors and subcontractor shall insert in any Contracts the clauses contained herein in(a)(1) through (10) and such other clauses as the Department of Energy may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The Recipient shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of the paragraphs in this clause.

(7) Contract termination: debarment. A breach of the Contract clauses in 29 CFR 5.5 may be grounds for termination of the Contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this Contract.

(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this Contract shall not be subject to the general disputes clause of this Contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Recipient, Subrecipient, the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

(i) By entering into this Contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this Contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

(b) Contract Work Hours and Safety Standards Act. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No Contractor or subcontractor contracting for any part of the Contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the Contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The Department of Energy or the Recipient or Subrecipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any other Federal contract with the same prime Contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to

satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Contracts and Subcontracts. The Recipient, Subrecipient, and Recipient's and Subrecipient's contractor or subcontractor shall insert in any Contracts, the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier

subcontracts. The Recipient shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

(5) The Contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the Contract for all laborers and mechanics, including guards and watchmen, working on the Contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. The records to be maintained under this paragraph shall be made available by the Contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the Department of Energy and the Department of Labor, and the Contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

SECTION 01 00 00

BASIC REQUIREMENTS

PART 1 GENERAL

1.1 SECTION SUMMARY

A. Section Includes:
1. Section Summary
2. Summary of the Work
3. Contractor Use of Premises
4. Applications for Payment
5. Alternates
6. Coordination
7. Cutting and Patching
8. Conferences
9. Progress Meetings
10. Submittal Procedures
11. Proposed Products List
12. Shop Drawings
13. Product Data
14. Samples
15. Manufacturers' Instructions
16. Manufacturers' Certificates
17. Quality Assurance / Quality Control of Installation
18. References
19. Interior Enclosures
20. Protection of Installed Work
21. Parking
22. Staging Areas
23. Occupancy During Construction and Conduct of Work
24. Protection
25. Progress Cleaning
26. Products
27. Transportation, Handling, Storage and Protection
28. Product Options
29. Substitutions
30. Starting Systems
31. Demonstration and Instructions
32. Contract Closeout Procedures
33. Final Cleaning
34. Adjusting
35. Operation and Maintenance Data
36. Spare Parts and Maintenance Materials
37. Record Drawings and Specifications

1.2 SUMMARY OF THE WORK

A. Project Description: Perform the Work as specified and detailed in Construction Documents package. Contractor to provide domestic hot water system with heat recovery and all associated piping and controls, including Division 23 HVAC work and Division 26 electrical work.

B. Work by Owner: Asbestos Abatement and reinsulating pipes and fittings that are not part of project.

C. Work by Others: Furnishing and installing the heat recovery heat exchanger.

D. Permits: Prior to commencement of the Work, Contractor to secure any and all necessary permits for completion of the Work and facility occupancy.

1.3 CONTRACTOR USE OF PREMISES

A. Limit use of premises to allow work by others and work by Owner.

1.4 APPLICATIONS FOR PAYMENT

A. Submit two (2) copies of each application on AIA G702™ and G703™ forms or approved contractors invoice form.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

C. Payment Period: Monthly.

1.5 ALTERNATES

A. Schedule of Alternates: there are no alternates proposed for this project.

1.6 COORDINATION

A. Coordinate scheduling, submittals, and work of various sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify utility requirement characteristics of operating equipment are compatible with building utilities.

C. Coordinate space requirements and installation of mechanical and electrical work that are indicated diagrammatically on Drawings.

1.7 CUTTING AND PATCHING

A. Employ a skilled and experienced installer to perform cutting and patching new work; restore work with new Products.

B. Submit written request in advance of cutting or altering structural or building enclosure elements.

C. Fit work tight to adjacent elements. Maintain integrity of wall, ceiling, or floor construction; completely seal voids. Seal fire rated openings with code complying system.

D. Refinish surfaces to match adjacent finishes.

1.8 CONFERENCES

A. Dane County Department Public Works, Highway & Transportation will schedule a preconstruction conference after Award of Contract for all affected parties.

B. When required in individual Specification section, convene a pre-installation conference at project site prior to commencing work of the section.

1.9 PROGRESS MEETINGS

A. Engineer shall schedule and administer meetings throughout progress of the Work at minimum of twice (2) per month

B. Engineer shall preside at meetings, record minutes, and distribute copies within two (2) days to those affected by decisions made.

1.10 SUBMITTAL PROCEDURES

A. Submittal form to identify Project, Contractor, Subcontractor or supplier; and pertinent Construction Documents references.

B. Apply Contractor's stamp, signed or initialed, certifying that review, verification of Products required, field dimensions, adjacent construction work, and coordination of information is in accordance with requirements of the Work and Construction Documents.

C. Identify variations from Construction Documents and Product or system limitations that may be detrimental to successful performance of completing the Work.

D. Revise and resubmit submittals as required; identify all changes made since previous submittal.

1.11 PROPOSED PRODUCTS LIST

A. Within fifteen (15) days after date of Award of Contract, submit complete list of major Products proposed for use, with name of manufacturer, trade name, and model number of each Product.

1.12 SHOP DRAWINGS

A. Submit number of copies that Contractor requires, plus two (2) copies that shall be retained by Public Works Project Engineer and one (1) copy to be retained by the Engineer.

1.13 PRODUCT DATA

A. Submit number of copies that Contractor requires, plus two (2) copies that shall be retained by Public Works Project Engineer and one (1) copy to be retained by the Engineer.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this Project.

1.14 SAMPLES

A. Submit samples to illustrate functional and aesthetic characteristics of the Product.

B. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Public Works Project Engineer's selection.

1.15 MANUFACTURERS' INSTRUCTIONS

A. When specified in individual Specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

1.16 MANUFACTURERS' CERTIFICATES

A. When specified in individual Specification sections, submit manufacturers' certificate to Public Works Project Engineer for review, in quantities specified for Product Data.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

1.17 QUALITY ASSURANCE / QUALITY CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply fully with manufacturers' instructions.

C. Comply with specified standards as minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

1.18 REFERENCES

A. Conform to reference standard by date of issue current as of date for receiving bids.

B. Should specified reference standard conflict with Construction Documents, request clarification from Public Works Project Engineer before proceeding.

1.19 INTERIOR ENCLOSURES

A. Provide temporary partitions as required to separate work areas from Owner occupied areas, to prevent distribution of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.

1.20 PROTECTION OF INSTALLED WORK

A. Protect installed work and provide special protection where specified in individual Specification sections.

1.21 PARKING

A. Arrange for temporary parking areas to accommodate construction personnel. Parking for one car of pickup will be provided in CCB basement. County will provide Henry Street Ramp parking at no charge to contractor for duration of project.

1.22 STAGING AREAS

A. Coordinate staging areas with Public Works Project Engineer prior to starting the Work.

B. On-site space for use as staging areas and storage of materials is limited and will be apportioned among the various Contractors as their needs dictate with due regard for storage requirements of each Contractor. Each Contractor shall be responsible for safety of equipment and materials that are stored on site.

1.23 OCCUPANCY DURING CONSTRUCTION AND CONDUCT OF WORK

A. Areas of existing facility will be occupied during period when the Work is in progress. Work may be done during normal business hours (7:45 am to 4:30 pm), but confer with Owner, schedule work and store materials so as to interfere as little as possible with normal use of premises. Notify Owner when coring or similar noise making work is to be done and obtain Owner's written approval of schedule. If schedule is not convenient for Owner, reschedule and resubmit new times for Owner approval. Coring of floor along with other noisy work may have to be done on second and third shifts.

B. Work shall be done and temporary facilities furnished so as not to interfere with access to any occupied area and so as to cause least possible interference with normal operation of facility or any essential service thereof.

C. Contractor shall, at all times, provide approved, safe walkways and facility entrances for use by Owner, employees and public.

D. Contractor shall provide adequate protection for all parts of facility, its contents and occupants wherever the Work under this contract is to be performed.

E. Each Contractor shall arrange with Owner to make necessary alterations, do new work, make connections to all utilities, etc., at such times as will not cause interruption of utility services to facility. Contractor doing this work shall protect, cap, cut off and / or replace and relocate existing pipes, electrical work and other active utilities encountered which may interfere with new construction work. Interruption of utilities shall be confined to county off work hours.

1. Hot water service to the facility shall be maintained during construction. Service interruptions for removal of existing piping and equipment and tie-ins for installation of new piping and equipment shall be coordinated with Dane County Public Works Project Engineer and Dane County Facilities Maintenance Staff.

2. Number and duration of interruptions shall be kept a minimum. All materials and equipment shall be onsite before any shut down of the existing system.

F. New work in extension of existing work shall correspond in all respects with that to which it connects or similar existing work unless otherwise indicated or specified.
1. Existing work shall be cut, altered, removed or replaced as necessary for performance of contract obligations.
2. Work remaining in place, damaged or defaced by reason of work done under this contract shall be restored equal to its condition at time of Award of Contract.
3. If removal of work exposes discolored or unfinished surfaces or work out of alignment, such surfaces shall be refinished or materials replaced as necessary to make continuous work uniform and harmonious.

1.24 PROTECTION

A. Contractor shall protect from injury all trees, shrubs, hedges, walks and driveways and pay for any damage to same resulting from insufficient or improper protection.

B. Guard Light: Contractor shall provide and maintain guard lights at all barricades, railings, obstructions in streets, roads or sidewalks and at all trenches adjacent to public walks or roads.

1.25 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.

1.26 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work, but does not include machinery and equipment used for

preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components specifically identified for reuse.

B. Do not use materials and equipment removed from existing premises, except as specifically identified or allowed by Construction Documents.

1.27 TRANSPORTATION, HANDLING, STORAGE AND PROTECTION

A. Transport, handle, store and protect Products in accordance with manufacturer's instructions.

1.28 PRODUCT OPTIONS

A. Where definite material is specified, it is not intention to discriminate against "equal" product made by another manufacturer. Intention is to set definite standard of material quality. Should bidder choose to bid materials other than those specified, bidder shall submit said materials specifications to Department of Public Works, Highway & Transportation for approval at least seven (7) days prior to Bid Opening.

B. Products and materials that are not specified, but have been approved for use by Public Works Project Engineer shall be identified in addenda to all bidding contractors.

C. Requests for material or product substitutions submitted after Bid Opening may be considered. Dane County reserves right to approve or reject substitutions based on Specification requirements and intended use.

1.29 SUBSTITUTIONS

A. Public Works Project Engineer shall consider requests for Substitutions only within fifteen (15) days after date of Public Works Contract.

B. Document each request with complete data substantiating compliance of proposed Substitution with Construction Documents.

C. Submit three (3) copies of requests for Substitution for consideration. Limit each request to one (1) proposed Substitution.

D. Substitutions shall not change contract price established at Bid Opening.

1.30 STARTING SYSTEMS

A. Provide written notification prior to start-up of each equipment item or system.

B. Ensure that each piece of equipment or system is ready for operation.

C. Execute start-up under supervision of responsible persons in accordance with manufacturers' instructions.

D. Submit written report that equipment or system has been properly installed and is functioning correctly.

1.31 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of Products to Owner's personnel prior to date of final inspection.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at designated location.

C. Owner may choose to videotape demonstration session; demonstration and demonstrator shall be to level of satisfaction of Owner.

1.32 CONTRACT CLOSEOUT PROCEDURES

A. Submit written certification that Construction Documents have been reviewed, the Work has been inspected, and the Work is complete in accordance with Construction Documents and ready for Public Works Project Engineer's inspection.

B. Submit final Application for Payment identifying total adjusted Contract Sum / Price, previous payments, and amount remaining due.

1.33 FINAL CLEANING

A. Execute final cleaning prior to final inspection.

B. Clean interior and exterior surfaces exposed to view.

C. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.34 ADJUSTING

A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.35 OPERATION AND MAINTENANCE DATA

A. Provide operation and maintenance data for all mechanical and electrical equipment supplied and installed in project.

1.36 SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide Products, spare parts, maintenance and extra materials in quantities specified in individual Specification Sections.

B. Deliver to the Work site and place in location as directed.

1.37 RECORD DRAWINGS AND SPECIFICATIONS

A. Contractor-produced Drawings and Specifications shall remain property of Contractor whether Project for which they are made is executed or not. Contractor shall furnish Public Works Project Engineer with original tracings of drawings and prints of specifications in reproducible format, one set of Drawings and Specifications and one set of record drawings in AutoCAD 2007 (or lower), manually drafted format and entire record specification in Word 2000 (or lower) format on CD.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

Construction and Demolition Waste Management Appendix

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section specifies administrative and procedural requirements for the evaluation of recycling operations.

1.3 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, sealant (caulk), or the like.

B. Construction Waste: Used as an umbrella term in the construction waste management specifications and evaluation tools to encompass construction waste, demolition waste and remodeling waste.

C. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

D. Construction Waste Management Plan: A project-related plan for the collection, transportation, and disposal of waste generated at the construction site. The purpose of the plan is to reduce the amount of material being landfilled.

E. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitability, corrosiveness, toxicity or reactivity.

F. Landfill Tipping Fees: Monies paid for burying non-recyclable waste in the landfills.

G. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitability, corrosiveness, toxicity, or reactivity.

H. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

I. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse.

J. Recycle: To remove a waste material from the Project site to another site for remanufacture into a new product for reuse.

K. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

L. Return: To give back reusable items or unused products to vendors for credit.

M. Reuse: To reuse a construction waste material in some manner on the Project site.

N. Scrap Revenue: Monies received by the hauler for recyclable materials.

O. Sediment: Soil and other debris that has been eroded and transported by storm, or well production runoff water.

P. Trash: A product or material unable to be reused, returned, recycled, or salvaged.

Q. Volatile Organic Compounds (VOC's): Chemical compounds common in and emitted by many building products over time through out-gassing: Solvents in paints and other coatings, wood preservatives, strippers and household cleaners, adhesives in particleboard, fiberboard, and some plywoods, and foam insulation. When released, VOC's can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea, damage to the liver, kidneys, and central nervous system, and possibly cancer.

R. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.4 RECYCLING SERVICES AND EQUIPMENT

A. Recycling Service Options

1. Identify businesses that provide recycling services, determine which recycling services hauler(s) can provide, and identify other organizations that provide recycling or waste reduction services, such as education and documentation.

2. Option No. 1: Hire A Full-Service Recycling Contractor

a. Many or all source-separation and collection tasks are subcontracted to a recycling contractor. These contractors can provide training and on-site sorting services. Seek out the best service and the best fees (or prices) for materials targeted for recycling.

3. Option No. 2: Use A Hauler's Recycling Service

a. A hauler may offer recycling services. These services will generally be less complete than those of a full-service recycling contractor, but may be sufficient if the Contractor's own personnel can perform tasks the waste hauler does not. If the waste hauler does not provide re-sorting services or training to prevent future mis-sorting, establish an in-house training program to prevent mis-sorting. Mis-sorted materials will be treated as waste by the hauler, and recycling savings will be lost.

b. Ensure that the recycling goals are indicated in the Agreement made with the waste hauler. The Agreement shall include a list of materials intended to be recycled, the recycling markets to be used, the landfill that will be used for construction waste, acceptable contamination levels, a rate schedule, amount of time needed to respond to calls for pickup, and a requirement for monthly reports of quantities collected by volume and weight of each material, charges/revenues, and markets.

4. Option No. 3: Operate An In-House Recycling Program

a. The Contractor shall be responsible for source-separation, collection, and the ordering of drop-offs and pick-ups. This option employs waste haulers that provide direct recycling services of certain recyclables and may include pick-up. Their services, fees, and/or rebates may vary depending on the material involved and other applicable factors. Other recycling services may be negotiated with the hauler.

5. Recycling by Major Subcontractors

a. Major Subcontractors, (e.g., Mechanical and Electrical Subcontractors), may assume responsibility for their respective recycling and waste reduction programs, including but not limited to source separating, maintaining bins, and arranging drop-offs and pick-ups. These major Subcontractors may participate in any of the options listed above.

b. Subcontractors who do their own recycling shall report applicable recycling/waste amounts to the General Contractor monthly. The General Contractor shall be responsible for tabulating quantities and submitting the results to the Owner and Architect at **[Substantial] [Final]** Completion of the Project.

B. Required Services and Equipment

1. Provide services and equipment necessary for successful recycling including the following, without limitation:

a. Materials sorting.

b. Bins.

c. Signs.

d. Education and training.

e. Monitoring.

f. Pick-ups.

g. Documentation.

2. If an in-house recycling program using a waste hauler is used, identify materials intended to be recycled off-site and document all recycling accomplished.

1.5 APPLICATIONS FOR RECYCLED MATERIALS

A. Reuse and Recycling Information: Agencies having information regarding applications and destinations for reuse and recycling construction and demolition waste materials include the following:

1. Construction Material Recycling Association. http://www.cdrecycling.org.
2. Dane County Dept. of Public Works. http://www.co.dane.wi.us/pubworks/recyc/markets.htm.
3. Habitat for Humanity. http://www.restoredane.org.
4. Solid & Hazardous Waste Education Center, UW Extension. http://www.uwex.edu/shwec.
5. WasteCap Wisconsin, Inc. www.wastecapwi.org.
6. Wisconsin Department of Natural Resources, http://www.dnr.state.wi.us/org/aw/wm/condemo/index.htm

B. Examples of materials and potential applications for recyclable materials include the following, without limitation:

1. Aluminum Cans, Straps, and Sheet: Recycle as a metal.
2. Asphalt: Break up and transport asphalt-to-asphalt recycling facility or recycle on site.
3. Brick: Can be reused if whole, crushed for use as landscape cover, sub-base material, or fill.
4. Building Components And Fixtures: Windows, doors, cabinets, hardware, plumbing and electrical fixtures may be salvaged. Porcelain plumbing fixtures may be crushed for fill.
5. Carpet and Carpet Pad: Store clean, dry carpet and pad in a closed container or trailer. Carpet may be able to be reused or recycled if sufficient quantities are generated.
6. Ceiling Panels: If sufficient quantities are generated, sort by size, palletize, and shrink-wrap for shipment to and recycling by a ceiling tile manufacturer.
7. Concrete: Can be crushed and graded for use as riprap, aggregate, sub-base material, or fill. Neutralize alkalinity if planting above. Remove reinforcement and other metals from concrete and sort with other metals.
8. Concrete Block: Can be reused if whole, crushed for use as sub-base material or fill.
9. Copper Pipe and Accessories: Recycle as a metal.
10. Corrugated Cardboard and Paper: Separate for recycling into new paper products. Painted, waxed or muddy cardboard or paper is unsuitable for recycling and should be discarded.
11. Dimensional Lumber, Oriented Strand Board, Plywood, Crates, and Pallets: Sort larger pieces for reuse. Wood unsuitable for reuse may be used to manufacture particleboard and other composite wood products. Chip or shred wood for use as animal bedding, landscape use, groundcover, mulch, compost, pulp, or process fuel. Do not chip or shred stained, painted or treated wood. Some recyclers have equipment to remove nails.
12. Doors and Hardware: If separated for reuse, brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
13. Glass Containers: Recycle as glass.
14. Gypsum Board: Gypsum wallboard to be processed and land spread must be new and clean construction scrap free of tape, joint compounds, paint, nails, screws, or other contaminants. Only regular ½" drywall, Type X drywall, and Plaster Base (standard blue board) may be used for a soil amendment. The following paper-faced gypsum panel can not be used as a soil amendment: WR (Green Board), Sheathing (Brown/Black Board), Mold Resistant Panels or Specialty Type X. These contain additives which may not be suitable as a soil amendment.
15. Land Clearing Debris: Can be chipped or shredded for use as ground cover, mulch, compost, pulp, or process fuel.
16. Lighting Fixtures: Separate lamps by type and protect from breakage. Fluorescent tubes must be recycled by law.

17. Miscellaneous Ferrous and Nonferrous Metals: Separate for recycling: banding, stud cut-offs, ceiling grid, ductwork, conduit, rebar, roofing, pipe, sheet metals, extruded metals, castings, miscellaneous steel shapes, and other metal parts.
18. Piping: If separated for reuse, reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinkler heads, and other components by type and size.
19. Precast Concrete Panels: May be able to be crushed and used for erosion control or landscape features.
20. Sheet Metal Scrap and Metal Duct Accessories: Recycle as a metal.
21. Structural Steel: Can be used in the manufacture of structural steel.
22. Vinyl: Siding, window extrusions, floor tiles, and sheet flooring may be able to be separated for recycling into new vinyl products.

END OF APPENDIX

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
BASED ON DSF MASTER SPECIFICATION DATED 12/11/2007

INDEX:

PART 1 - GENERAL

DESCRIPTION

Applicable provisions of Division 01 shall govern all work under this Section.

This Section specifies requirements for salvaging, recycling and disposing of construction waste.

RELATED DOCUMENTS

The following related resource documents are available:

1. Recycling Evaluation Tools
2. Construction Waste Management Appendix

PRECONSTRUCTION AND PREBID MEETINGS

The Pre-bid Conference (if conducted) and Preconstruction Conference will include discussion of construciton waste management requirements. Prior to the commencement of the Work, the Lead Contractor should schedule and conduct a meeting with Dane County and the Architect to discuss the proposed Construction Waste Management Plan to develop a mutual understanding regarding details of construction waste management implementation.

WASTE MANAGEMENT GOALS

The recycling goal (including reuse) to be achieved at Substantial Completion of the Project shall be at least [70 percent] by weight or volume of total waste generated by the Project and includes reuse.

Reduce: The Project shall generate the least amount of waste and methods shall be used that minimize waste due to error, poor planning, breakage, mishandling, contamination, or similar factors. Promote the resourceful use of materials to the greatest extent possible.

Reuse: All Contractors and Subcontractors shall reuse materials to the greatest extent possible. Salvage reusable materials for resale, for reuse on this Project, or for storage for use on future projects. Return reusable items (e.g., pallets or unused products) to the material suppliers.

Recycle: As many of the waste materials not able to be eliminated in the first place or salvaged for reuse shall be recycled. Waste disposal in landfills shall be minimized to greatest extent possible.

SUBMITTALS

Construction Waste Management Plan: Prior to commencing demolition or construction activities, the Lead Contractor, with input from all Prime & Subcontractors, shall develop and submit a Construction Waste Management Plan to Dane County for approval within 15 working days after Contract award or prior to any waste removal. The construction waste management plan can be generated by WasteCapTRACE based on information entered by the Lead Contractor.

Summary of Waste Progress Reports: Throughout the duration of the Project, the Lead Contractor shall report to Dane County with their periodic Applications for Payment a Summary of Waste including the quantity of each material recycled, reused, or salvaged, the receiving party, and the applicable diversion rates. This reporting shall take place using WasteCapTRACE, an on-line documentation system. There is a fee, to be included in the bid, of .02 cents per gross square foot of the project for use of WasteCapTRACE. Lead Contractor and Prime Contractors shall maintain a record of related weight tickets, manifests, receipts, and invoices for review by Dane County on request.

Summary of Waste Final Documentation: At Substantial Completion of the Project, the Lead Contractor shall submit a final summary of reuse and recycling results for all Prime & Subcontractors, including the quantity of each material recycled, reused, or salvaged, the receiving party and the applicable diversion rates. The final report will be generated by WasteCapTRACE based on information entered throughout the project by the Lead Contractor.

CONSTRUCTION WASTE MANAGEMENT PLAN

The purpose of the Construction Waste Management Plan is to achieve successful reuse and recycling with the highest possible reuse and recycling rates. The Plan shall include the following:

A schedule identifying milestones and key reporting dates of Construction Waste Management.

A list of waste materials expected to be generated from the Project as debris.

> A list of each material proposed to be salvaged, reused, recycled and discarded. Identify applicable markets for reuse and/or recycling. At a minimum, all materials required by State law to be recycled shall be recycled (e.g., cardboard, cans, bottles, office paper, fluorescent tubes, refrigerants, mercury, etc.) and scrap metal shall be recycled.

Separation and Materials Handling Procedures: Description of how waste materials identified above will be separated, cleaned (if necessary) and protected from contamination.

Educational and Motivational Procedures: Meetings to be held and other proposed methods for educating construction personnel regarding waste reduction and recycling.

Waste Auditing Procedures: Methods of monitoring and enforcing the Plan.

Documentation Procedures: Methods of documenting materials leaving the Project site as waste, for reuse or recycling to allow Summary of Waste Progress Reports to be submitted with Applications for Payment.

The Lead Contractor shall distribute copies of the Construction Waste Management Plan to Dane County's Project Manager & Project Representative, each Prime Contractor, and the Architect.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION

CONSTRUCTION WASTE MANAGEMENT PLAN IMPLEMENTATION

The Lead Contractor shall be responsible for coordinating the separation, handling, recycling, salvage, reuse, and return methods to be used by all construction personnel. The Lead Contractor shall be responsible for reporting the results of the Construction Waste Management Plan. The Lead Contractor shall designate a "Waste Manager" who is responsible for instructing construction personnel and overseeing and documenting results of the Construction Waste Management Plan.

Instruction: The Lead Contractor shall provide on-site instruction regarding appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all construction personnel throughout the duration of the Project.

Separation Facilities: The Lead Contractor shall lay out and identify a specific area on the Project site for separating materials for recycling, salvage, reuse, and return. The Lead Contractor shall provide waste bins and shall keep these bins & the recycling area neat, clean and clearly marked to avoid contamination of materials.

Sorting: The following sorting methods are acceptable:

Sorting recyclable materials at the Project site and transporting them to recycling markets directly from the Project site.

Employing haulers who make use of a materials-recovery facility or a transfer station where recyclable materials are sorted from the waste and recycled before disposing of the remainder. If using a hauler or recycling facility to sort out recyclables, verify that the hauler sorts out all construction waste loads and is not limited to those that are not acceptable at the landfill. Also, verify that the hauler or recycling facility recycles at least three types of materials.

Hazardous Waste: Hazardous waste shall be disposed of according to General Requirements Article 31 "Cleaning and Waste Disposal." (Hazardous Waste is a separate category and not part of the basis on which the recycling percentage is calculated.)

Application for Payments: The Contractor shall submit the Summary of Waste with the Applications for Payment according to a schedule outlined in the Construction Waste Management Plan approved by Dane County. Failure to submit this information shall render the Application for Payment null and void, thereby delaying the Progress Payment.

The following resources are provided for information only, to aid the Contractor in managing the Project's construction waste:

The Wisconsin DNR, Bureau of Waste Management
http:/www.dnr.state.wi.us/org/aw/wm/

The UW-Extension's Solid and Hazardous Waste Education Center
http://www1.uwex.edu/ces/shwec/ , email shwec@uwm.edu or telephone: 608-262-0385.

WasteCap Resource Solutions, Inc.
http://www.wastecap.org or telephone: 414-961-1100 or 608-245-1100.

* * *

Recycling Evaluation Tools

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for the evaluation of recycling operations.

1.3 CONSTRUCTION OR DEMOLITION WASTE MANAGEMENT PLAN FORM

A. The purpose of the Construction Waste Management Plan Form is to identify construction waste reduction goals, identify targeted materials, and explain specific waste reduction actions to be taken, by whom, and when.

1.4 SITE MONITORING FORM

The most effective construction waste management programs include methods for providing feedback on how successful the program has worked. Tracking project costs may indicate whether money is being saved, but may not indicate why money is being saved. Furthermore, it cannot indicate whether the savings are the maximum possible. Waste audits, on the other hand, reveal opportunities for increased savings, such as significant amounts of recyclables ending up in waste bins, or non-recyclables ending up in bins designated for recyclables. Waste audits provide feedback throughout the duration of the Project.

A. Allows the Contractor to quantify the amount of recyclables being discarded and to identify missed opportunities.

B. Guides the Contractor through the removal and sorting process of materials.

C. Provides a listing of potential categories of materials for sorting the waste dumpster.

D. A photographic record taken during a waste audit of recyclables found in the waste dumpster can be very effective.

E. Requires the Contractor to identify major subcontractors on site contributing to the waste stream.

F. Takes approximately 15 minutes to fill out.

G. Should be used weekly, or at a minimum, during major shifts in construction activities.

H. Identifies specific items that may be hindering the recycling program and can be addressed for immediate results.

I. Creates a record over time to show improvements in sorting or identifies phases of the Project that need extra attention.

1.5 MONITORING RESULTS

Waste audit results indicate whether a change in the Construction Waste Management Plan is necessary. An audit may indicate that more of a particular material waste is being generated than originally anticipated. If so, the material should be targeted for the remainder of the Project. The waste audit serves as a reminder to seek new recycling options that have become available since the commencement of the Project.

Construction or Demolition Waste Management Plan Form

Project Name: _____

Contractor: _____

Construction Waste Management Plan Manager (Contractor's Representative):

_____

Project Location: _____

Estimated Construction Dates: _____

PROJECT SCOPE - indicate type of structure (e.g., steel, concrete, etc.), building size, project cost, space constraints, etc.

RECYCLING GOAL - To recycle ____ % of waste generated on the site by weight. (Minimum goal 50%)

Goals and Intent:

Reduce: The Project shall generate the least amount of waste and methods shall be used that minimize waste due to error, poor planning, breakage, mishandling, contamination, or similar factors. Promote the resourceful use of materials to the greatest extent possible.

Reuse: The Contractor and Subcontractors shall reuse materials to the greatest extent possible. Reuse includes the following:

1. Salvage reusable materials for resale, for reuse on this Project, or for storage for use on future projects.
2. Return reusable items (e.g., pallets or unused products) to the material suppliers.

Recycle: As many of the waste materials not able to be eliminated in the first place or salvaged for reuse shall be recycled. Waste disposal in landfills shall be minimized to greatest extent possible.

ANALSYS OF ESTIMATED CONSTRUCTION WASTE TO BE GENERATED

A. Projected waste materials
   - ☐ Asphalt
   - ☐ Brick
   - ☐ Cans and bottles
   - ☐ Cardboard
   - ☐ Carpet
   - ☐ Carpet pad
   - ☐ Ceiling tile scrap
   - ☐ Concrete
   - ☐ Glass
   - ☐ Gypsum board
   - ☐ Insulation scrap
   - ☐ Land clearing wood
   - ☐ Metal – wire, pipe cutoffs, etc.
   - ☐ Pallets
   - ☐ Paper
   - ☐ Plastics including stretch wrap, plastic bags and Styrofoam
   - ☐ Untreated wood, plywood, OSB, particleboard
   - ☐ Structural steel
   - ☐ Vinyl
   - ☐ Other (specify) _____

B. Produce a preliminary list of materials that may be targeted for reuse or recycling (based on size and type of construction and other relevant information). Complete the list based on the availability of recycling and waste reduction services and on feedback from key Subcontractors who will be working on the Project. Focus recycling efforts on high potential materials and practices. Select materials that are generated in greatest volume, that have the most market value, that can be easily separated and that are recycled locally.

C. Estimated quantities of waste materials, by type (use Project estimates or commercial construction weight estimates below, compiled by WasteCap Wisconsin based on WI State Averages and commercial construction projects. Actual percentages will vary based on the project and type of construction.)

Material	Estimated % (by weight)	Estimated Tons
Total Estimated		
Trash (25%)		
Cans & Bottles (2%)		
Cardboard (5%)		
Concrete/masonry (21%)		
Drywall (11%)		
Metal (11%)		
Wood (25%)		
Reuse (0%)		
Other		
Total (100%)		

TYPE OF RECYCLING SERVICE PROVIDERS AND TARGETED MATERIALS
(Refer to Construction Waste Management Appendix)
Evaluate Cost and Services Offered Service Provider Agreements in Place

Company #1 _____
Company #2 _____
Company #3 _____

Company #	**Material**	**How and where waste is disposed or diverted**
	Trash	
	Cans & Bottles	
	Cardboard	
	Concrete/Masonry	
	Scrap Metal	
	Wood	
	Other	
	Other	
	Other	

MATERIALS-HANDLING PROCEDURES

Contractors and Subcontractors will separate and handle materials as stated below.

Example: Cardboard: Separate and flatten clean cardboard and boxboard and place in designated containers on the Project site. Do not include waxed cardboard, tissue, paper plates or towels, pizza boxes or any item that is not paper. Separate plastic, Styrofoam and other items which may be stuck to the cardboard boxes. Staples may be left in cardboard. Cardboard that is over 50% covered in mud, paint or other contaminants should be disposed of as trash. The cardboard will be sorted, sold and made into new paper products.

RECYCLING OPERATIONS

Action *** Who

Order dumpsters - oversee delivery _____

Site dumpsters/collection sites for optimum convenience _____

Educate Project site personnel on recycling requirements _____

Order signs for dumpsters and other recycling bins _____

Sort or process recyclables on site _____

Take trash and recyclables to the dumpsters _____

Schedule dumpster pickups/drop offs_____

Monitor dumpsters for contamination _____

Document recycling results _____

*** Depending on the service option chosen, these may be the responsibility of the field personnel, construction waste manager, the hauler, a recycling contractor, or the Subcontractors.

EDUCATIONAL AND MOTIVATIONAL PLAN – Check all items intended to be used

Actions

- ❒ Complete Construction Waste Management Plan
- ❒ Hold Orientation/Kick Off Meeting
- ❒ Update & Progress in Weekly Project-Site Meetings
- ❒ Encourage Just-in-time deliveries
- ❒ Post Targeted Materials (signage)
- ❒ Distribute tip sheets to Project-site personnel
- ❒ Post goals/progress (signage)
- ❒ Use formal agreements committing subs to program
- ❒ Require those who contaminate dumpsters to re-sort
- ❒ Provide stickers, t-shirts, hats or other incentives
- ❒ Public recognition of participating subs
- ❒ Take photos to document progress and share
- ❒ At site visits, discuss waste management with Project-site personnel
- ❒ Conduct periodic presentations for Project-site personnel on waste issues
- ❒ _____

WASTE AUDITING PROCEDURES – Describe how the recycling program will be monitored so that recycling and trash containers are kept free of contamination. Include frequency of monitoring

DOCUMENTATION PROCEDURES

Who

- ❒ Perform monthly cost and materials tracking (required) _____
- ❒ Perform final evaluation (required) _____

Site Waste and Recyclables Monitoring Form

Project Name: _____

Date/Time: _____

Monitor Name: _____

1. Are all containers (trash and recycling) together in one area? ❒ Yes ❒ No

2. Do all containers have clear signs for the materials that belong in them? ❒ Yes ❒ No

3. Are the signs clearly visible to workers who approach them? ❒ Yes ❒ No

4. Is there easy access to all containers? (Is there anything in the way?) ❒ Yes ❒ No
   (If "No," describe measures to be taken to eliminate the obstructions)

5. Is the dumpster area dry and firm? ❒ Yes ❒ No

6. Is the dumpster area (check one):
   - ❒ Neat and tidy
   - ❒ Somewhat messy
   - ❒ Dirty (needs to be cleaned)

   Comment: _____

7. Check individual dumpsters

TRASH

Contamination (Check all applicable items)

- ❒ Auto batteries
- ❒ Cans or bottles
- ❒ Cardboard
- ❒ Concrete
- ❒ Metal
- ❒ Other _____
- ❒ Paper
- ❒ Tires
- ❒ Waste Oil
- ❒ Wood

Comments:

_____

_____

CARDBOARD

Contamination (Check all applicable items)

- ❒ Muddy or painted cardboard
- ❒ Oily cardboard
- ❒ Pizza boxes or other food containers
- ❒ Waxed cardboard
- ❒ Mortar and cement bags
- ❒ Boxes with plastic, wood, or other packing material
- ❒ Other _____
- ❒ Boxes with trash or sweepings in them
- ❒ Beverage containers
- ❒ Metal
- ❒ Plastic
- ❒ Wood
- ❒ Trash

Does this container require cleaning? ❒ Yes ❒ No
(Note: Small amounts – up to 5% -- of these materials are acceptable)

Comments:

_____

CONCRETE

Contamination (Check all applicable items)

- ❒ Dirt
- ❒ Organic materials (brush, grass, etc.)
- ❒ Wire mesh
- ❒ Other _____

Does this container require cleaning? ❒ Yes ❒ No

Comments:

_____

METAL

Contamination (Check all applicable items)

- ❒ Loose welding rods
- ❒ Aluminum cans
- ❒ Electrical ballast
- ❒ Electrical capacitors
- ❒ Insulated electric wire
- ❒ Metal painted with lead paint
- ❒ Glass
- ❒ Light bulbs
- ❒ Other _____
- ❒ Aerosol cans
- ❒ Batteries (any kind)
- ❒ Freon bottles (or other gas bottles)
- ❒ Lead
- ❒ Barrels and drums
- ❒ Oil cans and filters
- ❒ Paint cans
- ❒ Closed containers of any kind

Does this container require cleaning? ❒ Yes ❒ No

Comments:

_____

GYPSUM BOARD

Contamination (Check all applicable items)

- ❒ Painted gypsum board
- ❒ Cement board
- ❒ Moisture-resistant gypsum board (green board)
- ❒ Reinforced-type gypsum boards
- ❒ Other specialty gypsum board(s)
- ❒ Corner bead (or other metal strips)
- ❒ Nails, screws or other metal fasteners
- ❒ Does this container require cleaning? ❒ Yes ❒ No

Comments:

_____

WOOD

Contamination: (Check all applicable items)

Very small amounts (about 2% or less) of the following materials are acceptable in the wood containers. Document their presence in writing.

- ❒ Cardboard
- ❒ Paper or paper cups
- ❒ Other _____

The following items, if present in the wood container, require immediate removal. Notify the Lead Contractor's representative.

- ❒ Treated lumber
- ❒ Painted or varnished lumber
- ❒ Metal strapping
- ❒ Reinforcing rod
- ❒ Pallets or wooden spools with bolts and fasteners 1/4-inch or larger
- ❒ Truss plates
- ❒ Any metal other than nails and staples
- ❒ Glass bottles

Try to determine where the contaminants came from and how they got in the dumpster. Possible source of contamination:

_____

Does this container require cleaning? ❒ Yes ❒ No

Comments:

_____

OTHER

Material being recycled: _____

Contamination (List contaminants) _____

Does this container require cleaning? ❒ Yes ❒ No

Comments:

_____

8. **Mark the areas that need attention to help meet the Project's recycling goals**:
   - ❒ Lack of space to place containers
   - ❒ Subcontractors not knowledgeable of recycling requirements
   - ❒ Subcontractors not cooperative
   - ❒ Recycling bins are not provided
   - ❒ Recycling markets are not available
   - ❒ Dumpsters are not in fenced area
   - ❒ Other _____

Final Construction Waste Management Plan Form

Project Name:_____
Plan Manager: _____
Representing:_____
Location: _____
Date: _____

Construction Waste Reduction Goals

To evaluate the quantitative success of your program summarize the data on your monthly tracking form, measured against goals set in your Construction Waste Management Plan.

Percent Reduction Goal:_____ Actual Percent Reduction: _____

Cost Savings Goal: _____ Actual Cost Savings: _____

Construction Waste Management Program Strengths and Weaknesses

Please evaluate the strengths and weaknesses of each aspect of the Construction Waste Management Plan in the charts below. Space is also provided to list any original ideas implemented and/or suggest improvements to the existing aspects and tools.

Methods to Reduce, Reuse and Recycle

Strengths	Weaknesses	Suggested/implemented Improvements

Communication and Motivation Tools

Strengths	Weaknesses	Suggested/implemented Improvements

Evaluation Tools

Strengths	Weaknesses	Suggested/implemented Improvements

Trash/ Recyclables/Reused Materials Hauling Log

Project Name: _____

Date	Material (Trash, Wood, Concrete, E	Hauled By	Ticket No.	Dumpster Size/ Weight/ Volume

Recycling Coordinator: Complete for all materials that leave the Project site.
Project Manager: Verify hauling invoices with information on this log.

❒ Log Faxed To Construction Waste Manager ❒ Log Faxed To Project Manager Date:_____

SECTION 22 05 00
COMMON WORK RESULTS FOR PLUMBING

P A R T 1 - G E N E R A L

SCOPE

This section includes information common to two or more technical plumbing specification sections or items that are of a general nature, not conveniently fitting into other technical sections. Included are the following topics:

PART 1 - GENERAL
- Scope
- Reference
- Standards
- Quality Assurance
- Continuity of Existing Services
- Codes
- Certificates and Inspections
- Submittals
- Operating and Maintenance Data
- Training of Owner Personnel
- Record Drawings

PART 2 - PRODUCTS
- Identification
- Sealing and Fire Stopping
- Concrete Work

PART 3 - EXECUTION
- Demolition
- Concrete Work
- Placing Concrete
- Cutting and Patching
- Building Access
- Equipment Access
- Coordination
- Identification
- Lubrication
- Training

REFERENCE

Applicable provisions of Division 1 govern work under this section.

This section applies to all Division 22 00 00 sections of plumbing.

STANDARDS

Abbreviations of standards organizations referenced in this and other sections are as follows:

ABMA	American Boiler Manufacturers Association
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASPE	American society of Plumbing Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CS	Commercial Standards, Products Standards Sections, Office of Eng. Standards Service, NBS
EPA	Environmental Protection Agency

FS Federal Specifications, Superintendent of Documents, U.S. Government Printing Office
IAPMO International Association of Plumbing & Mechanical Officials
MCA Mechanical Contractors Association
MICA Midwest Insulation Contractors Association
MSS Manufacturer's Standardization Society of the Valve & Fitting Industry, Inc.
NBS National Bureau of Standards
NEC National Electric Code
NEMA National Electrical Manufacturers Association
NFPA National Fire Protection Association
NSF National Sanitation Foundation
PDI Plumbing and Drainage Institute
UL Underwriters Laboratories Inc.

Standards referenced in this section:

ACI 614	Recommended Practice for Measuring, Mixing and Placing of Concrete
ASTM E814	Standard Test Method for Fire Tests of Through-Penetration Fire Stops
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials
D.O.T.	Standard Specifications for Road and Bridge Construction, State of Wisconsin, Dept. of Transportation
UL1479	Fire Tests of Through-Penetration Firestops
UL723	Surface Burning Characteristics of Building Materials

QUALITY ASSURANCE

Substitution of Materials: Refer to Section - Basic Requirements

All products and materials used are to be new, undamaged, clean and in good condition. Existing products and materials are not to be reused unless specifically indicated.

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 for obtaining the intended performance from the system into which these items are placed.

CONTINUITY OF EXISTING SERVICES

Do not interrupt or change existing services without prior written approval from the Owner's Project Representative. When interruption is required, coordinate scheduling of down-time with the Owner to minimize disruption to his activities. Unless specifically stated, all work involved in interrupting or changing existing services is to be done during "OFF" hours.

CODES

Comply with requirements of Wisconsin Administrative Code.

CERTIFICATES AND INSPECTIONS

Refer also to Division 1, - Basic Requirements

Obtain and pay for all required City of Madison or State of Wisconsin installation inspections except those provided by the Architect/Engineer in accordance with Wis. Admin. Code Section ILHR 50.12. Deliver originals of these certificates to the Owner's Project Representative. Include copies of the certificates in the Operating and Maintenance Instructions.

SUBMITTALS

Refer to Division 1, - Basic Requirements

Not more than two weeks after award of contract but before any shop drawings are submitted, contractor to submit the following plumbing system data sheet. List piping material type for each piping service on the project, ASTM number, schedule or pressure class, joint type, manufacturer and model number where appropriate. List valves and specialties for each piping service, fixture and equipment with manufacturer and model number. The approved plumbing system data sheet(s) will be made available to the Owner's Project Representative for their use on this project.

PLUMBING SYSTEM DATA SHEET

Item	Pipe Service/Sizes	Manufacturer/Model No.	Remarks
Pipe			
Fittings			
Unions			
Valves:			
Ball			
Butterfly			
Balancing			
Check			
Pipe Specialties:			
Thermometers			
Press Gauges			
Strainers			
Hangers & Supports			
Insulation			
Plbg. Equipment			

Shop drawing submittals are to be bound, labeled, contain the project manual cover page and a material index list page showing item designation, manufacturer and additional items supplied with the installation. Submit for all equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number. 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. Include wiring diagrams of electrically powered equipment.

Submit sufficient quantities of equipment data sheets and shop drawings to allow the following distribution:

- Insertion into Operating and Maintenance Manuals 2 copies
- Dane County Public Works - record copy 1 copy
- Engineers - record copies 2 copies

OPERATION AND MAINTENANCE DATA

All operations and maintenance data shall comply with the submission and content requirements specified under section - Basic Requirements.

Two copies of Operations and Maintenance Manuals shall be provided for the following distribution:

- Dane County Public Works 1 copy
- Dane County Facilities Management 1 copy

In addition to the general content specified under - Basic Requirements supply the following additional documentation:

1. Records of tests performed a to certify compliance with system requirements
2. Manufacturer's wiring diagrams for electrically powered equipment
3. Certificates of inspection by regulatory agencies
4. Valve schedules
5. Lubrication instructions, including list/frequency of lubrication

6. Parts lists for fixtures, equipment, valves and specialties.
7. Manufacturers installation, operation and maintenance recommendations for fixtures, equipment, valves and specialties.
8. Additional information as indicated in the technical specification sections

TRAINING OF OWNER PERSONNEL

Instruct owner personnel in the proper operation and maintenance of systems and equipment provided as part of this project. Include not less than 2 hours of instruction, using the Operating and Maintenance manuals during this instruction. Demonstrate startup, operation and shutdown procedures for all equipment. All training to be during normal working hours.

RECORD DRAWINGS

Refer to Division 1, - Basic Requirements, Record Drawings.

P A R T 2 - P R O D U C T S

IDENTIFICATION

STENCILS:

Not less than 1 inch high letters/numbers for marking pipe and equipment.

ENGRAVED NAME PLATES:

White letters on a black background, 1/16 inch thick plastic laminate, beveled edges, screw mounting, Setonply Style 2060 by Seton Name Plate Company or Emedolite Style EIP by EMED Co., or equal by W. H. Brady.

SNAP-AROUND PIPE MARKERS:

One-piece, preformed, vinyl construction, snap-around or strap-around pipe markers with applicable labeling and flow direction arrows, ¾" min. size for lettering. Provide nylon ties on each end of pipe markers. Equal to Seton Setmark.

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, brass "S" hooks or one piece nylon ties around the valve stem, available from EMED Co., Seton Name Plate Company, or W. H. Brady.

SEALING AND FIRESTOPPING

FIRE AND/OR SMOKE RATED PENETRATIONS:

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: Contractor shall 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 judgement can be based upon.

Use a product that has a rating not less than the rating of the wall or floor being penetrated. Reference architectural 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.

NON-RATED PENETRATIONS:

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 drywall, plaster or wood partitions where sleeve is not required use urethane caulk in annular space between pipe insulation and wall material

CONCRETE WORK

AGGREGATES
Durable aggregate material meeting the requirements of ASTM C33M-08.

CEMENT
Portland cement meeting the requirements of ASTM C150-07, Type I.

WATER
Potable water.

MIX PROPORTION
Prepare mix proportion for each type of concrete listed on Table 03300-2, as necessary to complete the work.

Type	Use	Min. Compressive Strength (psi)	Slump (in)	Min. Cement Content (Bags/CY)	Max. Water Content (Gal/CY)	Air Content (%Vol.)
AA	Equipment Bases	4000 psi (28-day)	1-3	6	30	5-8

WELDED WIRE FABRIC (WWF)GENERAL
Unless otherwise noted, WWF roll stock is not permitted.
Plain Welded Wire Reinforcement
Conform to ASTM A185M-07

P A R T 3 - E X E C U T I O N

DEMOLITION
Perform all demolition as indicated on the drawings to accomplish new work. Where demolition work is to be performed adjacent to existing work that remains in an occupied area, construct temporary dust partition to minimize the amount of contamination of the occupied space. Where pipe is removed and not reconnected with new work, cap ends of existing services as if they were new work. Coordinate work with the Owner to minimize disruption to the existing building occupants.

All pipe, fixtures, equipment, wiring and associated conduit, insulation and similar items demolished, abandoned, or deactivated are to be removed from the site by the Contractor except as specifically noted otherwise. Maintain the condition of material and/or equipment that is indicated to be reused equal to that existing before work began.

CONCRETE WORK

Cast-in-place concrete within the building will be performed by this Division Contractor unless otherwise noted. Provide all layout drawings, 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.

Plumbing related cast-in-place concrete to be provided by this division contractor. This includes equipment pads, etc.

PLACING CONCRETE

Place concrete in accordance with the most stringent of either ACI 304 or this section.

Place and secure steel reinforcement prior to placing concrete.

Apply bonding agent to existing concrete surfaces requiring a bond with new concrete.

Convey concrete from truck to final position by method that will prevent separation.

Place concrete continuously so that concrete is deposited on or adjacent to concrete that is still plastic.

CUTTING AND PATCHING

Provide required Cutting and Patching to complete the work.

BUILDING ACCESS

Arrange for the necessary openings in the building to allow for admittance or removal of all apparatus. When the building access was not previously arranged and must be provided by this contractor, restore any opening to its original condition after the apparatus has been brought into the building.

When access to the work area is through occupied areas coordinate building access times with the Owners representive

EQUIPMENT ACCESS

Install all piping, conduit and accessories to permit access to equipment for maintenance and service.

COORDINATION

Coordinate all work with other contractors prior to installation. Any work that is not coordinated and that interferes with other contractor's work shall be removed or relocated at the installing contractor's expense.

Verify that all devices are compatible for the type of construction and surfaces on which they will be used.

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.

Where stenciling is not appropriate for equipment identification, engraved name plates may be used.

Identify all new interior piping. 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.

Identify valves with brass tags bearing a system identification and a valve sequence number. Identify medical gas and vacuum valves with brass tags and wall or cabinet mounted color coded engraved nameplate with the following "(Type of Gas) Shutoff Valve for (Location or Zone)". 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 to be framed under clear plastic.

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 Owner. 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.

TRAINING

Contractor to provide factory authorized representative and/or field personnel knowledgeable with the operations, maintenance and troubleshooting of the system and/or components defined within this section for a minimum period of 2 hours.

END OF SECTION

SECTION 22 05 15
PIPING SPECIALTIES

P A R T 1 - G E N E R A L

SCOPE

This section contains specifications for plumbing piping specialties for all piping systems. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference
- Reference Standards
- Shop Drawings
- Operation and Maintenance Data
- Design Criteria

PART 2 - PRODUCTS
- Thermometers
- Thermometer Sockets
- Test Wells
- Test Plugs
- Pressure Gauges
- Strainers

PART 3 - EXECUTION
- Thermometers
- Thermometer Sockets
- Test Wells
- Test Plugs
- Pressure Gauges
- Strainers

RELATED WORK

Section 22 11 00 - Facility Water Distribution Section 22 05 23 - General-Duty Valves for Plumbing Piping
Section 22 07 00 - Plumbing Insulation
Section 22 30 00 - Plumbing Equipment

REFERENCE

Applicable provisions of Division 1 govern work under this section.

REFERENCE STANDARDS

ASTM B650 Electrodeposited Engineering Chromium Coatings on Ferrous Substrates

QUALITY ASSURANCE

Substitution of Materials: Refer to Section - Basic Requirements.

SHOP DRAWINGS

Required for all items in this section. Include materials of construction, dimensional data, ratings/capacities/ranges, approvals, test data, pressure drop data where appropriate, and identification as referenced in this section and/or on the drawings.

OPERATION AND MAINTENANCE DATA
All operations and maintenance data shall comply with the submission and content requirements specified under section - Basic Requirements..

DESIGN CRITERIA

All piping specialties are to be rated 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.

P A R T 2 - P R O D U C T S

THERMOMETERS
Ashcroft, Marsh, Taylor, H. O. Trerice, Ametek/U. S. Gauge, Weiss, Wika, Weksler.

Stem Type: Cast aluminum case, nine inch scale, clear acrylic window. adjustable angle brass stem with stem of sufficient length so the end of the stem is near the middle of a pipe without reducing the thickness of any insulation, red indicating fluid, black lettering against a white background, with scale ranges as follows:

Service	Hot Water
Scale Range, ^{o}F	30 - 180
Increment, ^{o}F	2

THERMOMETER SOCKETS
rass with threaded connections suitable for thermometer stems and temperature control sensing elements in pipeline. Furnish with extension necks for insulated piping systems.

TEST WELLS
Similar to thermometer sockets except with a brass cap that threads into the inside of the test well to prevent dirt from accumulating. Secure cap to body with a short chain. Furnish with extension necks, where appropriate, to accommodate the pipeline insulation.

TEST PLUGS
Brass threaded pressure and temperature test plug with neoprene self-closing valve, valve retainer, brass threaded cap, rated for 150 psi and 0-200 degrees F.

PRESSURE GAUGES
Ametek/U. S. Gauge, Ashcroft, Marsh, Taylor, H. O. Trerice, Weiss, Wika, Weksler.

Cast aluminum case of not less than 4.5 inches in diameter, double strength glass window, black lettering on a white background, phosphor bronze bourdon tube with bronze bushings, recalibration from the front of the dial, 99% accuracy over the middle half of the scale, 98.5% accuracy over the remainder of the scale, with scale range as follows:

Service	Hot Water	Cold Water	Compressed Air
Scale Range, psig	0-100	0-100	0-200
Increment, psig	1	1	2

Pressure Snubbers: Bronze construction, 300 psig working pressure, 1/4" size.

Gauge Valves: Use ball valves as specified in Section 22 05 23 - General-Duty Valves for Plumbing Piping.

STRAINERS
Armstrong, Illinois, Keckley, Metraflex, Mueller Steam, Sarco, Watts.

Y type; cast bronze body, ASTM B62; 20 mesh stainless steel screens; bolted or threaded screen retainer tapped for a blowoff valve; sweat, threaded or flanged body rated at not less than 150 psi WOG.

Y type; cast iron body, ASTM A126; 20 mesh stainless steel screens; bolted or threaded screen retainer tapped for a blowoff valve; threaded or flanged ends; rated at not less than 150 psi WOG.

P A R T 3 - E X E C U T I O N

THERMOMETERS
Stem Type: Install in piping systems as indicated on the drawings and/or details using a separable socket in each location.

THERMOMETER SOCKETS
Install at each point where a thermometer or temperature control sensing element is located in a pipeline.

TEST WELLS
Install in piping systems as indicated on the drawings and/or details wherever provisions are needed for inserting a thermometer at a later date.

TEST PLUGS
Install in piping systems as indicated on the drawings and/or details wherever provisions are needed for short-term measurement of pressure or temperature.

PRESSURE GAUGES
Install in locations where indicated on the drawings and/or details, with scale range appropriate to the system operating pressures.

Pressure Snubbers: Install in gauge piping for all gauges used on water services.

Gauge Valves: Install at each gauge location as close to the main as possible and at each location where a gauge tapping is indicated.

STRAINERS
Install all strainers where indicated allowing sufficient space for the screens to be removed. Install a ball valve in the tapped screen retainer.

END OF SECTION

SECTION 22 05 23
GENERAL DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

SCOPE

This section includes valve specifications for all Plumbing systems except where indicated under Related Work. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference
- Quality Assurance
- Submittals
- Operation and Maintenance Data
- Design Criteria

PART 2 - PRODUCTS
- Water System Valves
  - Ball Valves
  - Butterfly Valves
  - Gate Valves
  - Swing Check Valves
  - Balance Valves
  - Drain Valves
- Specialty Valves and Valve Accessories
  - Gauge Valves
  - Water Pressure Reducing Valves
  - Safety Relief Valves
  - Sewer Air and Vacuum Valves

PART 3 - EXECUTION
- General
- Shut-off Valves
- Balancing Valves
- Drain Valves

RELATED WORK

Section 22 30 00 - Plumbing Equipment

REFERENCE

Applicable provisions of Division 1 govern work under this section.

QUALITY ASSURANCE

Substitution of Materials: Refer to Section - Basic Requirements.

SUBMITTALS

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.

OPERATION AND MAINTENANCE DATA

All operations and maintenance data shall comply with the submission and content requirements specified under Section - Basic Requirements.

DESIGN CRITERIA

ASSE 1003 - Water Pressure Reducing Valves for Domestic Water Supply Systems.

Where valve types (ball, butterfly, etc.) are specified for individual plumbing services (i.e. domestic water, gas, etc.), each valve type shall be of the same manufacturer unless prior written approval is obtained from the Owner.

Valves to be line size unless specifically noted otherwise.

PART 2 - PRODUCTS

WATER SYSTEM VALVES

All water system valves to be rated at not less than 125 water working pressure at 240 degrees F unless noted otherwise.

BALL VALVES:

3" and smaller: Two or three piece bronze body; sweat ends, chrome plated bronze ball; 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. Apollo 70-200, Jomar T/S 100, Hammond 8511, Milwaukee BA150, Nibco S580-70, Watts B-6001.

BUTTERFLY VALVES:

2-1/2" and larger: Cast or ductile iron body; stainless steel shaft; bronze, copper or teflon bushings; EPDM resilient seat; EPDM seals; bronze, aluminum-bronze, EPDM encapsulated ductile iron or stainless steel disc. 200 psig WOG through 12", 150 psig WOG through 24". Valve assembly to be bubble tight to 175 psig with no downstream flange/pipe attached. Use tapped lug type valves with stud bolts or cap screws, or grooved end connection valves, permitting removal of downstream piping while using the valve for system shutoff. Centerline LT series, DeZurik 632, Hammond 6200 Series, Milwaukee M or C Series, Nibco LD2000/LC2860, Victaulic 300/608/700/709, Watts BF-03.

Provide 10 position locking lever handle actuators for valves 6" and smaller. Provide worm gear operators with external position indication for valves 8" and larger.

GATE VALVES:

Gate valves sizes 3 inches and larger, shall be iron body, bronze trim, outside screw and toke rising stem of red brass conforming to ASTM B16, alloy C36000, solid wedge. Flange and flange bolt circle shall match existing 3 inch tank gate valves. Equal to Nibco model F-617-0. Valves by Kitz and Milwaukee Valve are considered equal.

SWING CHECK VALVES:

3" and smaller: Bronze body, sweat ends, Y-pattern, regrindable bronze seat, renewable bronze disc, Class 125, suitable for installation in a horizontal or vertical line with flow upward. Crane 1342, Hammond IB941, Nibco S413B, Watts CVYS, Jomar, Apollo and Milwaukee equals.

4" and larger: Cast iron body, flanged ends, bronze trim, bolted cap, renewable bronze seat and disc, Class 125, non-asbestos gasket, suitable for installation in a horizontal or vertical line with flow upward. Crane 373, Hammond IR1124, Milwaukee F2974, Nibco F918B, Watts Series 411, Apollo equal.

BALANCE VALVES:
Bronze body globe or ball valve with calibrated brass orifice, integral pointer and calibrated scale to register degree of valve opening, memory stop, drain tapping, sweat or threaded ends, with or without integral unions, pressure taps with integral check valves and seals, adjustable memory stop, suitable for 125 psig water working pressure at 240 degrees F. Flowset AccuSetter, Armstrong CBV, Bell & Gossett Circuit Setter Plus, Illinois 6000 series, Tapco Circuit Setter, tour and Anderson.

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, Watts B-6000-CC/B-6001-CC series.

PART 3 - EXECUTION

GENERAL
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.

SHUT-OFF VALVES
Install shut-off valves at each piece of equipment, at each branch take-off from mains for isolation or repair and elsewhere as indicated.

BALANCING VALVES
Install where indicated on the drawings and details for balancing of flow in pumped hot water recirculation piping systems.
Upon project completion, adjust each valve and set position stop. Balance system to minimum flow in return piping branches needed to maintain even supply water temperature throughout building.

DRAIN VALVES
Provide 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.

END OF SECTION

SECTION 22 05 29
HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

P A R T 1 - G E N E R A L

SCOPE

This section includes specifications for supports of all plumbing equipment and materials as well as piping system anchors. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference
- Reference Standards
- Quality Assurance
- Description
- Shop Drawings
- Design Criteria

PART 2 - PRODUCTS
- Manufacturers
- Structural Supports
- Pipe Hangers and Supports
- Beam Clamps
- Concrete Inserts
- Anchors
- Equipment Stands

PART 3 - EXECUTION
- Installation
- Hanger and Support Spacing
- Riser Clamps
- Concrete Inserts
- Anchors

RELATED WORK

Section 22 07 00 - Plumbing Insulation for insulation protection at support devices.

REFERENCE

Applicable provisions of Division 1 shall govern work under this section.

REFERENCE STANDARDS

MSS SP-58

MSS SP-69

QUALITY ASSURANCE

Substitution of Materials: Refer to Section - Basic Requirements.

DESCRIPTION

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 building piping.

Do not hang any mechanical item directly from a metal deck or run piping so its rests on the bottom chord of any truss or joist.

Fasteners depending on soft lead for holding power or requiring powder actuation will not be accepted.

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; see Related Work above.

SHOP DRAWINGS

Schedule of all hanger and support devices indicating attachment methods and type of device for each pipe size and type of service.

All submittals are to comply with submission and content requirements specified Section - Basic Requirements.

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 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.

P A R T 2 - P R O D U C T S

MANUFACTURERS

Anvil, B-Line, Pate, Piping Technology or approved equal.

STRUCTURAL SUPPORTS

Provide all supporting steel required for the installation of mechanical 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 drawings.

PIPE HANGERS AND SUPPORTS

HANGERS FOR PIPE SIZES 1/2" THROUGH 2":
Carbon steel, adjustable swivel ring. B-Line B3170NF, Anvil 69 or 70.
Carbon steel, adjustable clevis, standard. B-Line B3100, Anvil 260.

HANGERS FOR PIPE SIZES 2" AND LARGER:
Carbon steel, adjustable clevis, standard. B-Line B3100, Anvil 260.

MULTIPLE OR TRAPEZE HANGERS:
Steel channels with welded spacers and hanger rods.

WALL SUPPORT:
Carbon steel welded bracket with hanger. B-Line 3068 Series, Anvil 194 Series.

Perforated, epoxy painted finish, 16-12 gauge, min., steel channels securely anchored to wall structure, with interlocking, split-type, bolt secured, galvanized pipe/tubing clamps. B-Line type S channel with B-2000 series clamps, Anvil type PS 200 H with PS 1200 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, equal to B-Line B1999 Vibra Cushion or provide manufacturers clamp and cushion assemblies, B-Line BVT series, Anvil PS 1400 series.

VERTICAL SUPPORT:
Carbon steel riser clamp. B-Line B3373, Anvil 261 for above floor use.

FLOOR SUPPORT:
Carbon steel pipe saddle, stand and bolted floor flange. B-Line B3088T/B3093.

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.

PIPE HANGER RODS
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-69 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. B-Line B3036L/B3034, Anvil 86/92.

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. B-Line B3054, Anvil 228.

CONCRETE INSERTS
POURED IN PLACE:
MSS SP-69 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. B-Line B2505, Anvil 281.

MSS SP-69 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. B-Line B3014N, Anvil 282.

DRILLED FASTENERS:
Carbon steel expansion anchors, vibration resistant, with ASTM B633 zinc plating. Use drill bit of same manufacturer as anchor. Hilti, Rawl, Redhead.

ANCHORS
Use welding steel shapes, plates, and bars to secure piping to the structure.

EQUIPMENT STANDS
Use structural steel members welded to and supported by pipe supports. Clean, prime and coat with three coat rust inhibiting alkyd paint or one coat epoxy mastic. Where exposed to weather, treat with corrosive atmosphere coatings.

P A R T 3 - E X E C U T I O N

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.

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.

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:

Pipe Material	Pipe Size	Max. Horiz. Spacing	Max. Vert. Spacing
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"
Copper	3"	10'-0"	10'-0"
Copper	4" and larger	12'-0"	10'-0"
Steel	1/2" through 1-1/4"	7'-0"	15'-0"
Steel	1-1/2" through 6"	10'-0"	15'-0"

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.

CONCRETE INSERTS

Select size based on the manufacturer's stated load capacity and weight of material that will be supported. 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, provide inserts that are flush with the slab surface.

ANCHORS

Install where indicated on the drawings and details. Where not specifically indicated, install anchors at ends of principal pipe runs and at intermediate points in pipe runs between expansion loops. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.

END OF SECTION

SECTION 22 07 00
PLUMBING INSULATION

PART 1 - GENERAL

SCOPE

This section includes insulation specifications for plumbing piping and equipment. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference
- Reference Standards
- Quality Assurance
- Description
- Definitions
- Shop Drawings
- Operation and Maintenance Data

PART 2 - PRODUCTS
- Materials
- Insulation & Jackets
- Insulation Inserts and Pipe Shields
- Accessories

PART 3 - EXECUTION
- Installation
- Piping, Valve and Fitting Insulation
- Equipment Insulation
- Construction Verification Items

RELATED WORK

Section 22 05 00 - Common Work Results for Plumbing
Section 22 11 00 - Facility Water Distribution
Section 22 30 00 - Plumbing Equipment

REFERENCE

Applicable provisions of Division 1 govern work under this section.

REFERENCE STANDARDS

ASTM B209	Aluminum and Aluminum Alloy Sheet and Plate
ASTM C165	Test Method for Compressive Properties of Thermal Insulations
ASTM C177	Heat Flux and Thermal Transmission Properties
ASTM C195	Mineral Fiber Thermal Insulation Cement
ASTM C302	Density of Preformed Pipe Insulation
ASTM C449	Mineral Fiber Hydraulic Setting Thermal Insulation Cement
ASTM C518	Heat Flux and Thermal Transmission Properties
ASTM C547	Mineral Fiber Preformed Pipe Insulation
ASTM C553	Mineral Fiber Blanket and Felt Insulation
ASTM C612	Mineral Fiber Block and Board Thermal Insulation
ASTM C921	Properties of Jacketing Materials for Thermal Insulation
ASTM C1136	Flexible Low Permeance Vapor Retarders for Thermal Insulation
ASTM E84	Surface Burning Characteristics of Building Materials
MICA	National Commercial & Industrial Insulation Standards
NFPA 225	Surface Burning Characteristics of Building Materials
UL 723	Surface Burning Characteristics of Building Materials

QUALITY ASSURANCE

Substitution of Materials: Refer to Section - Basic Requirements.

Label all insulating products delivered to the construction site with the manufacturer's name and description of materials.

DESCRIPTION

Furnish and install all insulating materials and accessories as specified or as required for a complete installation. The following types of insulation are specified in this section:

- Pipe Insulation
- Equipment Insulation

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 Project Representative.

DEFINITIONS

Concealed: shafts, furred spaces, space above finished ceilings, utility tunnels and crawl spaces. All other areas, including walk-through tunnels, shall be considered as exposed.

SHOP DRAWINGS

Submit a schedule of all insulating materials to be used on the project, including adhesives, fastening methods, fitting materials along with material safety data sheets and intended use of each material. Include manufacturer's technical data sheets indicating density, thermal characteristics, jacket type, and manufacturer's installation instructions.

OPERATION AND MAINTENANCE DATA

All operations and maintenance data shall comply with the submission and content requirements specified under Section - Basic Requirements.

PART 2 - PRODUCTS

MATERIALS

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 150.

INSULATION AND JACKETS

Manufacturers: Armstrong, Certainteed Manson, Childers, Dow, Extol, Halstead, H.B. Fuller, Imcoa, Knauf, Owens-Corning, Pittsburgh Corning, Rubatex, 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 .02 perms and minimum beach puncture resistance of 50 units.

SEMI-RIGID FIBERGLASS INSULATION:
Minimum nominal density of 3 lbs. per cu. ft., thermal conductivity of not more than 0.28 at 75 degrees F, minimum compressive strength of 125 PSF at 10% deformation, rated for service to 450 degrees F. Insulation fibers perpendicular to jacket and scored for wrapping cylindrical surfaces.

White kraft reinforced foil vapor barrier all service jacket, factory applied to insulation with a maximum permeance of .02 perms and minimum beach puncture resistance of 50 units.

FIREPROOFING INSULATION:
Mineral fiber with nominal density of 8 lbs. per cu. ft., flame spread index of 15, fuel contribution index of 0, and smoke developed index of 0, thermal conductivity of not more than 0.23 at 75 degrees F.

Jacket material shall be the same as jacket for adjacent insulation.

METAL JACKETS:
.016 inch thick aluminum or .010 inch thick stainless steel with safety edge.

INSULATION INSERTS AND PIPE SHIELDS
Manufacturers: B-Line, Pipe Shields, Value Engineered Products

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, Hamfab or equal, 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.

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 to be 3/4 inch wide, constructed of aluminum or stainless steel. Minimum thickness to be .015 inch for aluminum and .010 inch for stainless steel.

Tack fasteners to be stainless steel ring grooved shank tacks.

Staples to be clinch style.

Insulating cement to be ANSI/ASTM C195, hydraulic setting mineral wool.

Finishing cement to be ASTM C449.

Fibrous glass or canvas fabric reinforcing shall have a minimum untreated weight of 6 oz./sq. yd.

Bedding compounds to be non-shrinking and permanently flexible.

Vapor barrier coatings to be non-flammable, fire resistant, polymeric resin.

Fungicidal water base coating (Foster 40-20 or equal) to be compatible with vapor barrier coating.

PART 3 - EXECUTION

INSTALLATION

Install insulation, jackets and accessories in accordance with manufacturers 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.

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
- Equipment piping with a surface temperature below 65 degrees F

PIPING, VALVE, AND FITTING INSULATION

GENERAL:

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.

INSULATION INSERTS AND PIPE SHIELDS:
Provide 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 AND VALVES:
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.

PIPE INSULATION SCHEDULE:
Provide insulation on new and existing remodeled piping as indicated in the following schedule:

Service	**Insulation Types**	**Insulation Thickness by Pipe Size**				
		1" and smaller	**1-1/4" to 2"**	**2-1/2" to 4"**	**5" to 6"**	**8" and larger**
Hot Water Supply	Rigid Fiberglass	1.5"	1.5"	1.5"	1.5"	1.5"
Hot Water Circulating	Rigid Fiberglass	1"	1"	1.5"		
Cold Water	Rigid Fiberglass	0.5"	0.5"	1"	1"	1"

EQUIPMENT INSULATION
Do not insulate over equipment access manholes, fittings, nameplates or ASME stamps. Bevel and seal insulation at these locations.

SEMI-RIGID FIBERGLASS:
Apply insulation to equipment shells using weld pins, bonding adhesive, banded and wired in place. Fill all joints, seams and depressions with insulating cement to a smooth, even surface. Cover with reinforcing fabric and 2 coats of mastic. . Use vapor barrier mastic on systems requiring a vapor barrier.

EQUIPMENT INSULATION SCHEDULE:
Provide equipment insulation as follows:

Equipment	**Insulation Type**	**Thickness**	**Remarks**
Storage Tanks	Semi-Rigid Fiberglass	2"	

END OF SECTION

SECTION 22 11 00
FACILITY WATER DISTRIBUTION

P A R T 1 - G E N E R A L

SCOPE

This section contains specifications for plumbing pipe and pipe fittings for this project. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related
- Reference
- Reference Standards
- Shop Drawings
- Quality Assurance
- Delivery, Storage, and Handling
- Design Criteria

PART 2 - PRODUCTS
- Domestic Water
- Dielectric Unions and Flanges
- Unions and Flanges
- Mechanical Grooved Pipe Connections

PART 3 - EXECUTION
- General
- Preparation
- Erection
- Copper Pipe Joints
- Threaded Pipe Joints
- Mechanical Grooved Pipe Connections
- Domestic Water
- Dielectric Unions and Flanges
- Unions and Flanges
- Piping System Leak Tests

RELATED WORK

22 05 29 - Hangers and Supports for Plumbing Piping and Equipment
22 05 14 - Plumbing Specialties

REFERENCE

Applicable provisions of Division 1 govern work under this section.

REFERENCE STANDARDS

ANSI A21.4
ANSI A21.11
ANSI A21.51

ANSI B16.3	Malleable Iron Threaded Fittings
ANSI B16.4	Cast Iron Threaded Fittings
ANSI B16.5	Pipe Flanges and Flanged Fittings
ANSI B16.22	Wrought Copper and Wrought Copper Alloy Solder Joint Pressure Fittings
ANSI B16.29	Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV
ASTM A53	Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless
ASTM A105	Forgings, Carbon Steel, for Piping Components
ASTM A126	Gray Cast Iron Castings for Valves, Flanges, and Pipe Fittings

ASTM A234	Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures
ASTM B32	Solder Metal
ASTM B88	Seamless Copper Water Tube
ASTM B280	Seamless Copper Tube for Air Conditioning and Refrigeration Field Service
ASTM B813	Liquid and Paste Fluxes for Soldering Applications of Copper and Copper Alloy Tube
AWS A5.8	Brazing Filler Metal
AWWA C104	Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water
AWWA C105	Polyethylene Encasement for Ductile Iron Piping for Water
AWWA C110	Ductile Iron and Gray Iron Fittings, 3 In. Through 48 In., for Water and Other Liquids
AWWA C111	Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings
AWWA C151	Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids
AWWA C153	Ductile Iron Compact Fittings, 3 In. Through 48 In., for Water and Other Liquids
AWWA C600	Installation of Ductile Iron Water Mains and Their Appurtenances
AWWA C651	Disinfecting Water Mains

SHOP DRAWINGS

Schedule from the contractor indicating the ASTM, AWWA or CISPI specification number of the pipe being proposed along with its type and grade if known at the time of submittal, and sufficient information to indicate the type and rating of fittings for each service.

Statement from manufacturer on his letterhead that pipe furnished meets the ASTM, AWWA or CISPI specification contained in this section.

QUALITY ASSURANCE

Substitution of Materials: Refer to Section - Basic Requirements.

Order all copper, cast iron and steel with each length marked with the name or trademark of the manufacturer and type of pipe; with each shipping unit marked with the purchase order number, metal or alloy designation, temper, size, and name of supplier.

Any installed material not meeting the specification requirements must be replaced with material that meets these specifications without additional cost to the Owner.

DELIVERY, STORAGE, AND HANDLING

Promptly inspect shipments to insure that the material is undamaged and complies with 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.

Storage and protection methods must allow inspection to verify products.

DESIGN CRITERIA

Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM, AWWA or CISPI specifications as listed in this specification.

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 Contractor's option. Where the grade or type is not specified, 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 at Contractor's option.

P A R T 2 - P R O D U C T S

DOMESTIC WATER

ABOVE GROUND:

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 phosporous brazing alloy, AWS A5.8 BCuP. Copper mechanical grooved fittings and couplings on roll grooved pipe may be used in lieu of soldered fittings. Mechanically formed brazed tee connections may be used in lieu of specified tee fittings for branch takeoffs up to one-half (1/2) the diameter of the main.

Galvanized steel, Schedule 40, Grade A, ASTM A53; with cast iron threaded fittings, Class 125, ANSI B16.4; forged steel threaded fittings, ANSI 16.11; mechanical cut groove couplings and fittings; galvanize coat all fittings, ASTM A123.

DIELECTRIC UNIONS AND FLANGES

Watts Regulator Company, Lochinvar, Wilkins or EPCO Sales, Inc., dielectric unions 2" and smaller; dielectric flanges 2" and larger; with iron female pipe thread to copper solder joint or brass female pipe thread end connections, non-asbestos gaskets, having a pressure rating of not less than 175 psig at 180 degrees.

UNIONS AND FLANGES

Unions, flanges and gasket materials to 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.

2" AND SMALLER STEEL:

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.

2" AND SMALLER COPPER:

ANSI B16.18 cast bronze union coupling or ANSI B15.24 Class 150 cast bronze flanges.

2-1/2" AND LARGER STEEL:

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.

2-1/2" AND LARGER COPPER:

ANSI B15.24 Class 150 cast bronze flanges with full face teflon gaskets.

MECHANICAL GROOVED PIPE CONNECTIONS

Mechanical grooved pipe couplings and fittings, ASTM F1476, as manufactured by Victaulic, Gruvlok or Gustin-Bacon 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 to be rated for minimum 250 psi working pressure.

All mechanical grooved pipe material including gaskets, couplings, fittings and flange adapters to be from the same manufacturer.

Couplings to be malleable iron, ASTM A47, or ductile iron ASTM A536 with painted finish. Reducing couplings are not acceptable.

Fittings used on galvanized steel pipe to be malleable iron, ASTM A47, or ductile iron A536, with galvanized finish, ASTM A153. Fittings used on ductile iron pipe to be cement mortar lined ductile iron with coal tar coating, ASTM A536; conforming to requirements of AWWA C110/C153 and AWWA C606. Fittings used on copper pipe to be copper.

Gaskets to be EPDM, ASTM D2000. Gaskets for hot water systems and dry pipe systems to be flush seal design. Heat treated carbon steel oval neck track bolts and nuts, ASTM A183, with zinc electroplated finish ASTM B633.

Flange adapters to be ductile iron, ASTM A536; except at lug type butterfly valves where standard threaded flanges shall be used.

Credit for the inherent flexibility of mechanical grooved pipe connections when used for expansion joints or flexible connectors may be allowed upon specific application by the Contractor. Three flexible couplings at first three connection points both upstream and downstream of pumps may be used in lieu of flexible connectors. Request for expansion joints shall be made in writing and shall include service, location, line size, proposed application and supporting calculations for the intended service.

P A R T 3 - E X E C U T I O N

GENERAL

Install pipe and fittings in accordance with reference standards, manufacturers recommendations and recognized industry practices.

PREPARATION

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.

ERECTION

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 drawings for exact location of pipe spaces, ceiling heights, door and window openings, or other architectural details before installing piping.

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. 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.

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.

THREADED PIPE JOINTS

Use a thread lubricant or teflon tape when making joints; no hard setting pipe thread cement or caulking will be allowed.

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.

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 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.

Prior to use, isolate and fill system with potable water. Allow to stand 24 hours. Flush each outlet proceeding from the service entrance to the furthest outlet for minimum of 1 minute and until water appears clear. Fill system with a solution of water and chlorine containing at least 50 parts per million of chlorine and allow to stand for 24 hours. Alternately a solution containing at least 200 parts per million of chlorine may be used and allowed to stand for 3 hours. Flush system with potable water until chlorine concentration is no higher than source water level.

Wait 24 hours after final flushing. Take samples of water for lab testing. The number and location of samples shall be representative of the system size and configuration and are subject to approval by Engineer. Test shall show the absence of coliform bacteria. If test fails, repeat disinfection and testing procedures until no coliform bacteria are detected. Submit test report indicating date and time of test along with test results.

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.

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.

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 Owners representative. All pressure tests are to be documented on forms to be provided to the contractor.

	Test	Initial Test		Final Test	
System	Medium	Pressure	Duration	Pressure	Duration
Above Ground Domestic Water	Water	N/A		100 psig	8 hr

END OF SECTION

PIPING SYSTEM TEST REPORT

Date Submitted: _____

Project Name: _____

Location: _____ **Project No:** _____

Contractor: _____

□ Plumbing □ Fire Sprinkler

Test Medium: □ Air □ Water □ Other _____

Test performed per specification section No. _____

Specified Test Duration _____ Hours Specified Test Pressure _____ PSIG

System Identification: _____

Describe Location: _____

_____

Test Date: _____

Start Test Time: _____ Initial Pressure: _____ PSIG

Stop Test Time: _____ Final Pressure: _____ PSIG

Tested By: _____ Witnessed By: _____

Title: _____ Title: _____

Signed: _____ Signed: _____

Date: _____ Date: _____

Comments: _____

_____

_____

_____

SECTION 22 30 00
PLUMBING EQUIPMENT

P A R T 1 - G E N E R A L

SCOPE

This section includes specifications for water heaters, water softeners, pumps and other equipment used for plumbing applications. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Documents
- Reference
- Quality Assurance
- Shop Drawings
- Operation and Maintenance Data

PART 2 - PRODUCTS
- Water Heaters
- Storage Tanks
- Pumps
- Expansion Tanks

PART 3 - EXECUTION
- Installation
- Training

RELATED DOCUMENTS

Section 22 05 23 - General-Duty Valves for Plumbing Piping
Section 22 05 13 - Common Motor Requirements for Plumbing Equipment.
Section 22 07 00 - Plumbing Insulation
Division 26 00 00 - Electrical

REFERENCE

Applicable provisions of Division 1 shall govern work under this section.

QUALITY ASSURANCE

Substitution of Materials: Refer to Section - Basic Requirements.

Plumbing products requiring approval by the State of Wisconsin Dept. of Commerce must be approved or have pending approval at the time of shop drawing submission.

SHOP DRAWINGS

Include data concerning dimensions, capacities, materials of construction, ratings, certifications, weights, pump curves with net positive suction head requirements, manufacturer's installation requirements, manufacturer's performance limitations, and appropriate identification.

OPERATION AND MAINTENANCE DATA

All operations and maintenance data shall comply with the submission and content requirements specified under Section - Basic Requirements.

PART 2 - PRODUCTS

INSTANTANEOUS STEAM WATER HEATER
Manufacturer: Cemline Armstrong, Graham, Leslie, Sellers.

Instantaneous heater shall be Cemline Series SHE (horizontal); factory assembled and packaged. Water heater shall be constructed in accordance with ASME code for a working pressure of 150psig. The packaged water heater shall be constructed with a horizontal 316 stainless steel tank threaded opening, ¾" O.D. double walled 90:10 Cu-Ni (in) + Cu (out) tubes, copper lined tube sheet, and steel coil head.

Heater shall be mounted on a steel support skid.

Heater shall be factory assembled and piped including incoming steam strainer, electronic operated temperature regulator, main and auxiliary float and thermostatic steam traps, and condensate strainer. Coil shall be baffled and shall have an integral bronze circulator to circulate water across the coil.

Heater shall be supplied with solid-state control module with LED backlit LCD display and LED pilot lights to indicate on-off, primary high limit, and secondary high limit. Solid-state control module shall be provided with a field programmable digital electronic PID controller allowing the owner to set operating and temperature limits on the display screen. Solid-state control module shall have red alarm light and alarm horn with built in alarm silence relay. Solid-state control module shall be supplied with dry contact closure outputs to indicate to building automation system (BAS) the occurrence of power on, primary high temperature and secondary high temperature. The control module shall allow the BAS to turn the heater on or off through a remote relay suitable for 24 VAC, 1 amp. The control module shall allow BAS to remotely set the temperature of the heater using a 4-20mA input signal. The control module shall allow the BAS to remotely monitor the operating temperature. Control module shall be supplied with an on-off switch and be mounted in a NEMA 4 panel. All solenoids and limits shall be 24 VAC.

Heater shall be furnished with a water pressure gauge and an ASME pressure-temperature relief valve of sufficient size to relieve total BTU input of the coil.

Furnish water heater with additional safety system designed to relieve excessively heated water from the vessel. The safety system shall be field programmable for set point and differential and shall be of the electronic type.

Furnish two(2) steam control valves, one @ 1/3 load and one @ 2/3 load.

Heater shall be provided with a vacuum breaker.

Manufacturer shall assume responsibility for using correct sizing of components to assure performance designated in design criteria.

Heater shall be CEMLINE Corporation Model H10SEH1030-DW

Heater shall be mounted horizontal.

Coil to heat 33 GPM from 40°F to 120°F with 10psig steam to the control valve.

1350.53 #/hr of source steam, 9 psi pressure drop across the control valve.

STORAGE TANKS - THREE REQUIRED

Manufacturers: Ace Buehler, Adamson, Cemline, Patterson-Kelley, Reco, Wessels.

Vertical steel storage tank; ASME rated and stamped for 150 psig working pressure; complete with nonferrous inlet, outlet, return, relief and drain fittings; ASME T&P relief valve; steel saddles; gasketed 11"x15" inspection manhole lined same as tank. Wire brush tank exterior and apply one coat epoxy mastic for 5-8 mil minimum dry film thickness or abrasive blast and apply 3 coat alkyd finish. Line tank with ½" thick hydraulic cement suitable for use with soft water.

Warranty: Non-prorated 5 year warranty for tank against any failure. Provide factory warranty with shop drawing submittals and operation and maintenance manuals.

Storage tanks shall be equal to CEMLINE Model V200CST.

IN-LINE CLOSE COUPLED CENTRIFUGAL PUMPS

Manufacturer: Bell and Gossett, Gould, Grundfos, Taco.

Type: Horizontal single stage close coupled oil lubricated in-line pumps, 125 psig maximum working pressure at operating temperature of 225^{O}F. continuous. The manufacturer shall certify all pump ratings. All pumps to operate without excessive noise or vibration.

Casing: Bronze or stainless steel; flanged suction and discharge connection.

Impeller: Brass, bronze or thermoplastic, keyed to the shaft, single suction enclosed type, hydraulically and dynamically balanced.

Bearings: Oil lubricated bronze sleeve or ball bearings.

Shaft: Stainless steel or carbon steel with stainless steel or bronze sleeve, integral thrust collar.

Seal: Mechanical type, carbon rotating against a stationary ceramic seat, 225°F maximum continuous operating temperature.

Motor: Provide pump with open dripproof motor with built-in thermal overload protection sized for non-overloading over the entire pump curve. Furnish each pump and motor with a nameplate giving the manufacturer's name, serial number of pump, capacity in GPM and head in feet at design condition, horsepower, voltage, frequency, speed and full load current.

Building Circulator: B&G model NBF-45, three speed, 260 watts, single phase, 115 volts, 15GPM @ 13' HD.

Tank Circulator: B&G Model NBF-36, three speed, 260 watts, single phase, 115 volts, 10GPM @ 13' HD.

Tank Circulator (Reclaim): B&G Model NBF-22, 92 watts, single phase, 115 volts, 12GPM @ 7' HD.

EXPANSION TANKS

Manufacturer: Amtrol, Bell and Gossett, Wessels.

Vertical steel precharged hydro-pneumatic expansion tank, 125 psi ASME labeled construction, complete with replaceable flexible butyl rubber bladder, system connection fitting, Schrader type air charge fitting, steel base ring stand, factory prime and enamel painted exterior finish, ASME relief valve. Materials exposed to water to be NSF or FDA approved for potable water service.

Equal to Amtrol model no. ST-5-C

PART 3 - EXECUTION

INSTALLATION

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.

Set commercial water heaters and storage tanks on concrete housekeeping pads. Adjust and level equipment.

Connect equipment to water and drain piping using unions or flanges and isolation valves.

Size temperature and relief valves per CSA ratings. Pipe temperature and pressure relief valves to floor drain or floor as indicated.

Startup and test equipment adjusting operating and safety controls for proper operation.

Lubricate pumps before startup. Adjust pumps for rated flow. Clean and blowdown strainers after 8 hours of operation.

Adjust expansion tank precharge to scheduled minimum operating pressure prior to connecting to system.

TRAINING

Provide training to designated owner personnel. Refer to Section 22 05 00

END OF SECTION

SECTION 23 05 00
COMMON WORK RESULTS FOR HVAC

P A R T 1 - G E N E R A L

SCOPE
This section includes information common to two or more technical specification sections or items that are of a general nature, not conveniently fitting into other technical sections.

REFERENCE STANDARDS
Abbreviations of standards organizations referenced in other sections are as follows:

ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
EPA	Environmental Protection Agency
IEEE	Institute of Electrical and Electronics Engineers
MCA	Mechanical Contractors Association
MICA	Midwest Insulation Contractors Association
MSS	Manufacturer's Standardization Society of the Valve & Fitting Industry, Inc.
NBS	National Bureau of Standards
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
UL	Underwriters Laboratories Inc.
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials
UL723	Surface Burning Characteristics of Building Materials

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 for obtaining the performance from the system into which these items are placed. This may include changes found necessary during the testing, adjusting, and balancing phase of the project.

CONTINUITY OF EXISTING SERVICES
Do not interrupt or change existing services without prior written approval from the Dane County Project Representative. When interruption is required, coordinate the down-time with the Facilities Representative to minimize disruption to their activities. Unless specifically stated, all work involved in interrupting or changing existing services is to be done during "OFF" hours.

PROTECTION OF FINISHED SURFACES
Furnish one can of touch-up paint for each different color factory finish which is to be the final finished surface of the product. Deliver touch-up paint with other "loose and detachable parts" as covered in the Section - Basic Requirements..

SUBMITTALS
Submit for all material, equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number. 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.

Submit sufficient quantities of equipment data sheets and shop drawings to allow the following distribution:

*	Insertion into Operating and Maintenance Manuals	2 copies
*	Dane County Public Works - record copy	1 copy
*	Engineers - record copies	2 copies

OPERATION AND MAINTENANCE DATA
All operations and maintenance data shall comply with the submission and content requirements specified under section - Basic Requirements.

Two copies of Operations and Maintenance Manuals shall be provided for the following distribution:

*	Dane County Public Works	1 copy
*	Dane County Facilities Management	1 copy

In addition to the general content specified under - Basic Requirements supply the following additional documentation:

1. Records of tests performed a to certify compliance with system requirements
2. Manufacturer's wiring diagrams for electrically powered equipment
3. Certificates of inspection by regulatory agencies
4. Valve schedules
5. Parts lists for, valves and specialties.
6. Manufacturers installation, operation and maintenance recommendations for valves and specialties.
7. Additional information as indicated in the technical specification sections

CERTIFICATES AND INSPECTIONS

Obtain and pay for all required State or City installation inspections. Deliver originals of these certificates to the Project Representative.

RECORD DRAWINGS

Maintain Record Drawings of all changes to the project drawings.

In addition to the data indicated in the Section - Basic Requirements., maintain temperature control record drawings on originals prepared by the installing contractor/subcontractor. Include copies of these record drawings with the Operating and Maintenance manuals.

P A R T 2 - P R O D U C T S

IDENTIFICATION

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. W. H. Brady, Seton, Marking Services, or equal.

P A R T 3 - E X E C U T I O N

DEMOLITION

Perform all demolition as indicated on the drawings to accomplish new work. Where demolition work is to be performed adjacent to existing work that remains in an occupied area, construct temporary dust partition to minimize the amount of contamination of the occupied space. Where pipe is removed and not reconnected with new work, cap ends of existing services as if they were new work. Coordinate work with the owner to minimize disruption to the existing building occupants.

All pipe, and similar items demolished, abandoned, or deactivated are to be removed from the site by the Contractor. All piping specialties are to be removed from the site by the Contractor unless they are dismantled and removed or stored by the owner. All designated equipment is to be turned over to the owner for their use at a place and time so designated. Maintain the condition of material and/or equipment that is indicated to be reused equal to that existing before work began.

CUTTING AND PATCHING

Perform all required cutting and patching for the installation of the work.

EQUIPMENT ACCESS

Install all piping and accessories to permit access to equipment for maintenance and service.

COORDINATION
Coordinate all work with other contractors and owner prior to installation.

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

Use engraved name plates to identify control equipment.

END OF SECTION

SECTION 23 05 15
PIPING SPECIALTIES

P A R T 1 - G E N E R A L

SCOPE
This section contains specifications for HVAC piping specialties for all piping systems.

RELATED WORK
Section 23 22 13 - Steam and Condensate Heating Piping
Section 23 05 23 - General-Duty Valves for HVAC Piping
Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment
Section 23 07 00 - HVAC Insulation

SHOP DRAWINGS
Required for all items in this section. Include materials of construction, dimensional data, ratings/capacities/ranges, pressure drop data where appropriate, and identification as referenced in this section and/or on the drawings.

OPERATION AND MAINTENANCE DATA
All operations and maintenance data shall comply with the submission and content requirements specified under section - Basic Requirements..

DESIGN CRITERIA
All piping specialties are to be rated 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.

P A R T 2 - P R O D U C T S

STRAINERS

Manufacturers: Armstrong, Hoffman, Illinois, Keckley, Metraflex, Mueller Steam, or Sarco.

STEAM SYSTEMS (15 PSIG AND LOWER):
Y type; cast iron body; stainless steel screens; bolted or threaded screen retainer tapped for a blowoff valve; threaded in sizes through 2 inch and rated at not less than 250 psi at 400°F; flanged in sizes over 2 inch and rated at not less than 125 psi at 350°F. Screen to be 20 mesh for line sizes 2 inch and less, 0.050 inch perforations for line sizes over 2 inch.

P A R T 3 - E X E C U T I O N

STRAINERS
Install all strainers where indicated on the project details, allowing sufficient space for the screens to be removed. Rotate screen retainer where required by the installation so blowdown can remove accumulated dirt from the strainer body.

STEAM SYSTEMS - LOW PRESSURE (15 PSIG AND LOWER):
Install a gate valve for blowdown in the tapped screen retainer; valve to be the same size as the tapping, suitable for system pressure (reference section 23 05 23).

END OF SECTION

SECTION 23 05 23
GENERAL-DUTY VALVES FOR HVAC PIPING

PART 1 - GENERAL

SCOPE
This section includes valve specifications for all HVAC systems except where indicated under Related Work.

RELATED WORK
Section 23 05 15 - Piping Specialties

REFERENCE
Applicable provisions of Division 1 govern work under this section.

SUBMITTALS

Contractors shall 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.

OPERATION AND MAINTENANCE DATA
All operations and maintenance data shall comply with the submission and content requirements specified under section - Basic Requirements..

P A R T 2 - P R O D U C T S

MANUFACTURERS
See manufacturers listed at each item specified, or approved equal.

LOW PRESSURE STEAM/CONDENSATE (15 psig or less)

GATE VALVES:

2" and smaller: Class 150, bronze body, bronze trim, threaded ends, solid wedge, rising stem, non-asbestos packing, union bonnet, malleable iron hand wheel.

Crane 431UB, Hammond IB629, Milwaukee 1151(M), Nibco T134, Stockham B120.

2-1/2" and larger: Class 125, iron body, bronze trim, non-asbestos packing, bolted bonnet, O.S. & Y., solid wedge, flanged.

Crane 465-1/2, Hammond IR1140, Milwaukee F2885, Nibco F-617-O, Stockham G623.

SWING CHECK VALVES:
2" and smaller: Class 125, bronze body, threaded ends, regrindable seat, bronze disc, threaded cap, suitable for installation in a horizontal or vertical line with flow upward.

Crane 137, Hammond IB940, Milwaukee 509, Nibco T-413-B, Stockham B-319.

P A R T 3 - E X E C U T I O N

GENERAL
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 temperature control valves.

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. Valves installed with the stems down, will not be accepted.

SWING CHECK VALVES

Provide swing check valves where specified, detailed, and at steam condensate lines where they rise at outlet of traps. In such cases, provide isolation valves to allow repair or replacement of check valve.

END OF SECTION

SECTION 23 05 29
HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

P A R T 1 - G E N E R A L

SCOPE
This section includes specifications for supports of all HVAC equipment, materials and piping system anchors.

RELATED WORK
Section 23 07 00 - HVAC Insulation

REFERENCE STANDARDS
MSS SP-58 Pipe Hangers and Supports - Materials, Design and Manufacture.
MSS SP-59 Pipe Hangers and Supports - Selection and Application.

DESCRIPTION
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.

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; see Related Work above.

SHOP DRAWINGS
Schedule of all hanger and support devices indicating shields, attachment methods, and type of device for each pipe size and type of service. Reference section 23 05 00.

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.

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, routine maintenance, etc.

P A R T 2 - P R O D U C T S

PIPE HANGER AND SUPPORT MANUFACTURERS
Anvil, B-Line, Fee and Mason, Kindorf, Michigan Hanger, Unistrut, or approved equal. Anvil figure numbers are listed below; equivalent material by other manufacturers is acceptable.

PIPE HANGERS AND SUPPORTS
HANGERS FOR STEEL PIPE SIZES 1/2” THROUGH 2”:
Carbon steel, adjustable, clevis, black finish. Anvil figure 65 or 260.

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 is 12 inches. Equal to Anvil figure 167.

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 limits indicated.

Maximum Load (Lbs.) (650°F Maximum Temp.)	Rod Diameter (inches)
610	3/8
1130	1/2

Provide rods complete with adjusting and lock nuts.

CONCRETE INSERTS

Carbon steel expansion anchors, vibration resistant, with ASTM B633 zinc plating. Use drill bit of same manufacturer as anchor. Hilti, Rawl, Redhead.

P A R T 3 - E X E C U T I O N

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.

Piping shall be supported independently from ductwork and all other trades.

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.

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:

Pipe Material	Pipe Size	Max. Spacing
Steel	1/2" through 1-1/4"	6'-6"
Steel	1-1/2" through 6"	10'-0"

END OF SECTION

SECTION 23 07 00
HVAC INSULATION

P A R T 1 - G E N E R A L

SCOPE
This section includes insulation specifications for heating, ventilating and air conditioning piping, ductwork and equipment.

RELATED WORK
Section 23 05 00 - Common Work Results for HVAC
Section 23 22 13 - Steam and Condensate Heating Piping
Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment

REFERENCE STANDARDS

ASTM C165	Test Method for Compressive Properties of Thermal Insulations
ASTM C177	Heat Flux and Thermal Transmission Properties
ASTM C195	Mineral Fiber Thermal Insulation Cement
ASTM C302	Density of Preformed Pipe Insulation
ASTM C355	Test Methods for Test for Water Vapor Transmission of Thick Materials
ASTM C449	Mineral Fiber Hydraulic Setting Thermal Insulation Cement
ASTM C518	Heat Flux and Thermal Transmission Properties
ASTM C547	Mineral Fiber Preformed Pipe Insulation
ASTM C612	Mineral Fiber Block and Board Thermal Insulation
ASTM C921	Properties of Jacketing Materials for Thermal Insulation
ASTM C1136	Flexible Low Permeance Vapor Retarders for Thermal Insulation
ASTM D412	Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
ASTM E84	Surface Burning Characteristics of Building Materials
MICA	National Commercial & Industrial Insulation Standards
NFPA 225	Surface Burning Characteristics of Building Materials
UL 723	Surface Burning Characteristics of Building Materials

QUALITY ASSURANCE
Label all insulating products delivered to the construction site with the manufacturer's name and description of materials.

Insulation systems shall be applied by experienced contractors.

DESCRIPTION
Furnish and install all insulating materials and accessories as specified or as required for a complete installation. The following types of insulation are specified in this section:

- Pipe Insulation

Install all insulation in accordance with the latest edition of MICA (Midwest Insulation Contractors Association) Standard and manufacturer's installation instructions.

SHOP DRAWINGS
Submit a schedule of all insulating materials to be used on the project, including adhesives, fastening methods, fitting materials along with material safety data sheets and intended use of each material. Include manufacturer's technical data sheets indicating density, thermal characteristics, jacket type, and manufacturer's installation instructions.

ENVIRONMENTAL REQUIREMENTS
Do not store insulation materials on grade or where they are at risk of becoming wet. Do not install insulation products that have been exposed to water.

Protect installed insulation work with plastic sheeting to prevent water damage.

P A R T 2 - P R O D U C T S

MATERIALS

Manufacturers: Certainteed, Manson, Childers, Dow, H.B. Fuller, Imcoa, Johns Manville, Knauf, Owens-Corning, VentureTape or approved equal.

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:

Pipe 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 450 when tested in accordance with UL 723 and ASTM E84.

INSULATION TYPES

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.

JACKETS

PVC FITTING COVERS AND JACKETS (PFJ):
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, in kitchens or food processing areas or installed outdoors. Jacket thickness to be minimum .02" indoors/.03"outdoors for piping 12" and smaller, .03" indoors/.04" outdoors for piping 15" and larger.

ALL SERVICE JACKETS (ASJ):
Heavy duty, fire retardant material with white kraft reinforced foil vapor barrier, factory applied to insulation with a self-sealing pressure sensitive adhesive lap, maximum permeance of .02 perms and minimum beach puncture resistance of 50 units.

INSULATION INSERTS AND PIPE SHIELDS

Manufacturers: B-Line, Pipe Shields, Value Engineered Products

Construct inserts with calcium silicate or polyisocyanurate (service temperatures below 300 degrees F only), 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 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 preengineered/premanufactured product described above. On low temperature systems, high density rigid polyisocyanurate may be substituted for calcium silicate provided insert and shield length and shield gauge are increased to compensate for lower insulation compressive strength.

Precompressed 20# density molded fiberglass blocks, Hamfab or equal, of the same thickness as adjacent insulation may be substituted for calcium silicate inserts with one 1"x6" block for piping through 2-1/2" and three 1"x6" blocks for piping through 4". Submit shield schedule to demonstrate equivalency to preengineered/premanufactured product described above.

Wood blocks will not be accepted.

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 to be 3/4 inch wide, constructed of aluminum or stainless steel. Minimum thickness to be .015 inch for aluminum and .010 inch for stainless steel.

Tack fasteners to be stainless steel ring grooved shank tacks.

Staples to be clinch style.

Insulating cement to be ANSI/ASTM C195, hydraulic setting mineral wool.

Finishing cement to be ASTM C449.

Fibrous glass or canvas fabric reinforcing shall have a minimum untreated weight of 6 oz./sq. yd.

Bedding compounds to be non-shrinking and permanently flexible.

Vapor barrier coatings to have maximum applied water vapor permeance of .05 perms.

Fungicidal water base coating (Foster 40-20 or equal) to be compatible with vapor barrier coating.

P A R T 3 - E X E C U T I O N

EXAMINATION

Verify that all piping, equipment, and ductwork are tested and approved prior to installing insulation. Do not insulate systems until testing and inspection procedures are completed.

Verify that all surfaces are clean, dry and without foreign material before applying insulation materials.

INSTALLATION

All materials shall be installed by skilled labor regularly engaged in this type of work. All materials shall be installed in strict accordance with manufacturer's recommendations, building codes, and industry standards. Do not install products when the ambient temperature or conditions are not consistent with the manufacturer's recommendations. Surfaces to be insulated must be clean and dry.

Locate insulation and cover seams in the least visible location. All surface finishes shall be extended in such a manner as to protect all raw edges, ends and surfaces of insulation.

Install insulation with smooth and even surfaces. Poorly fitted joints or use of filler in voids will not be accepted. Provide neatly beveled and coated terminations at all nameplates, uninsulated fittings, or at other locations where insulation terminates.

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.

All pipe insulation shall be continuous through walls, ceiling or floor openings and through sleeves except where firestop or firesafing materials are required. Vapor barriers shall be maintained continuous through all penetrations.

PROTECTIVE JACKET INSTALLATION

PVC FITTING COVERS AND JACKETS (PFJ):

Lap seams and joints a minimum of 2 inches and continuously seal PVC 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. Secure PVC fitting covers with tack fasteners. For systems requiring a vapor barrier, apply a 1-1/2" band of mastic over ends, throat, seams and penetrations.

ALL SERVICE JACKETS (ASJ):

Heavy duty, fire retardant material with white kraft reinforced foil vapor barrier, factory applied to insulation with a self-sealing pressure sensitive adhesive lap, maximum permeance of .02 perms and minimum beach puncture resistance of 50 units.

PIPING, VALVE, AND FITTING INSULATION

GENERAL:
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 unless otherwise noted. Additionally secure with staples along seams and butt joints. Coat staples, longitudinal and transverse seams with vapor barrier mastic on systems requiring vapor barrier.

Install insulation continuous through pipe hangers and supports with hangers and supports on the exterior of insulation. Where a vapor barrier is not required or where roller hangers are not being used, 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.

Where insulated piping is installed on hangers and supports, the insulation shall be installed continuous through the hangers and supports. High density inserts shall be provided as required to prevent the weight of the piping from crushing the insulation. Pipe shields are required at all support locations. The insulation shall not be notched or cut to accommodate the supporting channels.

Fully insulate all reheat coil piping, fittings and valves (with the exeption of unions) up to coil connection to prevent condensation when coil is inactive during cooling season. Provide a vapor proof seal between the pipe insulation and the insulated coil casing.

INSULATION INSERTS AND PIPE SHIELDS:
Provide pipe shields at all hanger and support locations. Rigid insulation inserts shall be installed between the pipe and the insulation shields. Quantity and placement of inserts shall be according to the manufacturer's installation instructions, however the inserts shall be no less than 12" in length. Inserts shall be of equal thickness to the adjacent insulation and shall be vapor sealed as required for system.

Provide 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 AND VALVES:
Fittings, valves, unions, flanges, couplings and specialties may be insulated with factory molded or built up insulation of the same thickness as adjoining insulation. Where the ambient temperature exceeds 150 degrees F, cover insulation with fabric reinforcing and mastic. Where the ambient temperatures do not exceed 150 degrees, furnish and install PVC fitting covers.

PIPE INSULATION SCHEDULE:
Provide insulation on new and existing remodeled piping as indicated in the following schedule:

Service	**Insulation**	**Jacket**	**Insulation Thickness by Pipe Size**			
			≤ 1-1/4"	**1-1/2"**	**2" to <4"**	**4" to 6"**
Low Pressure Steam	Rigid Fiberglass	ASJ	1.5"	2"	3"	3"
Low Pressure Cond.	Rigid Fiberglass	ASJ	1.5"	1.5"	2"	2"

The following piping and fittings are not to be insulated:

- Steam Traps
- Piping unions for systems not requiring a vapor barrier

END OF SECTION

SECTION 23 09 25
INTEGRATED AUTOMATION SYSTEM (IAS)

PA R T 1 - G E N E R A L

SUMMARY

This section describes the Systems Integration scope of work for the project. This section also coordinates with the responsibilities of the Plumbing trade contractor pertaining to control products or systems, furnished by the Plumbing trade that will be integrated by this Section.

All labor, material, equipment and software not specifically referred to herein or on the plans, that are required to meet the functional intent of this specification, shall be provided without additional cost to the Owner.

CONTROLS PROVIDE WITH THE WATER HEATERS

The water heaters will be provided with a solid state control module that will provide all required system controls.

The heater controls will also include:

- The control module will be supplied with dry contact closure outputs to indicate to the building automation system (BAS) the occurrence of power on, primary high temperature and secondary high temperature.
- The control module shall allow the BAS to turn the heater "ON" or "OFF" through a remote relay suitable for 24 VAC.
- The control module shall allow the BAS to remotely set the temperature of the heater using an 4-20 mA input signal.
- The control module shall allow the BAS to remotely monitor the operating temperature.

SYSTEM DESCRIPTION

The Integrated Automation System (IAS) shall be comprised of Controller (NAC) if required and all other materials, and labor to provide the control as described here-in. The water heater control shall connect to the owner's local or wide area network, depending on configuration. Access to the system, either locally in each building, or remotely from a central site or sites, shall be accomplished through standard Web browsers, via the Internet and/or local area network. Each NAC shall communicate with the Domestic Water Heater Controllers provided by Division 22, Section 22 30 00.

The Section 23 09 25 Contractor shall integrate the water heater control with the existing BAS.

The BAS shall provide:

- The occurrence of power on, primary high temperature and secondary high temperature.
- Turn the heater "ON" or "OFF" through a remote through a remote relay suitable for 24 VAC.
- Remotely set the temperature of the heater using an 4-20 mA input signal.
- Remotely monitor the operating temperature.

RELATED WORK

Section 23 30 00 - Plumbing Equipment

SYSTEM INTEGRATION CONTRACTOR QUALIFICATIONS

General:

The System Integrator shall have a successful history in the design and installation of open control systems with browser based wide area network connectivity and shall provide evidence of this history as a condition of acceptance of bid.

Contractor Service:

- Qualified Bidder: Environmental Systems, Inc.
  W223N603 Saratoga Ave.
  Waukesha WI
  Telephone No. 262-544-8860

SUBMITTAL

Eight copies of shop drawings of the IAS system shall be submitted and shall consist of a complete list of equipment and materials, including manufacturers catalog data sheets and installation instructions. Shop drawings shall also contain complete wiring and schematic diagrams, software descriptions, calculations, and any other details required to demonstrate that the system has been coordinated and will properly function as a system. Terminal identification for all control wiring shall be shown on the shop drawings. A complete written Sequence of Operation shall also be included with the submittal package.

Submittal shall include a network cable schematic diagram depicting operator workstations, control panel locations and a description of the communication type, media and protocol.

Upon completion of the work, provide a complete set of 'as-built' drawings and application software on compact disk and on the Network Supervisor (NS) hard drive. Drawings shall be provided as AutoCAD™ or Visio™ compatible files. Eight copies of the 'as-built' drawings shall be provided in addition to the documents on magnetic floppy disk media or compact disk. Division 22 contractor shall provide as-builts for their portions of work. Section 23 09 25 contractor shall be responsible for as-builts pertaining to overall IAS architecture and network diagrams.

DIVISION OF WORK

The Plumbing Contractor shall be responsible for providing the water heaters with a complete solid state operating controller, capable of complete control of the operation of the water heaters. The water heater controller is provided with the ability to integrate with the BAS as described above. in the control devices, control panels, controller programming, controller programming software, controller input/output wiring, power wiring, interlock and safety wiring, controller network wiring.

The System Integrator (SI) shall be responsible for the Network Area Controller(s) (NAC) if required, software and programming of the NAC, graphical user interface software (GUI), development of all graphical screens, setup of schedules, logs and alarms, network management, global supervisory control applications, system integration and coordination of the NAC to the local or wide area network.

The System Integrator (SI) shall be responsible for providing the control devices, control panels, controller programming, controller programming software, controller input/output wiring, power wiring, interlock and safety wiring, controller network wiring.

WORK INCLUDED

Furnish and install the following application software as outlined in this section.

- User Interface software

The following will be developed:

- Provide custom set-up and development of the software to provide the functional and performance requirements specified. Develop system graphics for all specified mechanical and electrical systems, using animated objects to display all system variables and process valves, according to Owner standards.

RELATED WORK SPECIFIED ELSEWHERE

Section 22 30 00, Plumbing: Providing control devices and systems including but not limited to:

- Control panels, devices and wiring
- Control device

AGENCY AND CODE APPROVALS

All products of the IAS shall be provided with the following agency approvals. Verification that the approvals exist for all submitted products shall be provided with the submittal package. Systems or products not currently offering the following approvals are not acceptable: UL-916; Energy Management Systems, ULC; UL - Canadian Standards Association, FCC, Part 15, Subpart J, Class A Computing Devices.

SOFTWARE LICENSE AGREEMENT

The Owner shall sign a copy of the manufacturer's standard software and firmware licensing agreement as a condition of this contract. Such license shall grant use of all programs and application software to Owner as defined by the manufacturer's license agreement, but shall protect manufacturer's rights to disclosure of trade secrets contained within such software.

DELIVERY, STORAGE AND HANDLING

Provide factory-shipping cartons for each piece of equipment and control device. Maintain cartons through shipping, storage, and handling as required to prevent equipment damage. Store equipment and materials inside and protected from weather.

JOB CONDITIONS

Cooperation with Other Trades: Coordinate the Work of this section with that of other sections to insure that the Work will be carried out in an orderly fashion. It shall be this Contractor's responsibility to check the Contract Documents for possible conflicts between his Work and that of other crafts in equipment location, and conduit runs, electrical outlets and fixtures, air diffusers, and structural and architectural features.

P A R T 2 - P R O D U C T S

GENERAL

The Integrated Automation System (IAS) shall be comprised of a network of interoperable, stand-alone Network Area Controllers if required, graphical user interface software, network devices and other devices as required to provide the control of the water heaters as specified herein.

SYSTEM PROGRAMMING

The extension of the existing Graphical User Interface software (GUI) shall provide the ability to perform system programming and graphic display engineering as part of a complete software package. Access to the programming functions and features of the GUI shall be through password access as assigned by the system administrator.

A library of control, application, and graphic objects shall be provided to enable the creation of all applications and user interface screens. Applications are to be created by selecting the desired control objects from the library, dragging or pasting them on the screen, and linking them together using a built in graphical connection tool. Completed applications may be stored in the library for future use. Graphical User Interface screens shall be created in the same fashion. Data for the user displays is obtained by graphically linking the user display objects to the application objects to provide “real-time” data updates. Any real-time data value or object property may be connected to display its current value on a user display. Systems requiring separate software tools or processes to create applications and user interface displays shall not be acceptable.

Programming Methods:

- Provide the capability to copy objects from the supplied libraries, or from a user-defined library to the user’s application. Objects shall be linked by a graphical linking scheme by dragging a link from one object to another. Object links will support one-to-one, many-to-one, or one-to-many relationships. Linked objects shall maintain their connections to other objects regardless of where they are positioned on the page and shall show link identification for links to objects on other pages for easy identification. Links will vary in color depending on the type of link; i.e., internal, external, hardware, etc.
- Configuration of each object will be done through the object’s property sheet using fill-in the blank fields, list boxes, and selection buttons. Use of custom programming, scripting language, or a manufacturer-specific procedural language for configuration will not be accepted.
- The software shall provide the ability to view the logic in a monitor mode. When on-line, the monitor mode shall provide the ability to view the logic in real time for easy diagnosis of the logic

execution. When off-line (debug), the monitor mode shall allow the user to set values to inputs and monitor the logic for diagnosing execution before it is applied to the system.

- All programming shall be done in real-time. Systems requiring the uploading, editing, and downloading of database objects shall not be allowed.
- The system shall support object duplication within a customer's database. An application, once configured, can be copied and pasted for easy re-use and duplication. All links, other than to the hardware, shall be maintained during duplication.

P A R T 3 - E X E C U T I O N

INSTALLATION

All work described in this section shall be performed by a system integrator that have a successful history in the design and installation of integrated control systems. The installing office shall have a minimum of five years of integration experience and shall provide documentation in the submittal package verifying the company's experience.

Install system and materials in accordance with manufacturer's instructions, and as detailed on the project drawing set.

Drawings of IAS network are diagrammatic only and any apparatus not shown, but required to make the system operative to the complete satisfaction of the Architect shall be furnished and installed without additional cost.

Line and low voltage electrical connections to the water heater control shall be furnished and installed by the Plumbing Contractor.

WIRING

All electrical control wiring and power wiring to the NAC, computers and network components (routers, hubs, switches, etc.) shall be the responsibility of this Contractor.

All wiring shall be in accordance with the, the National Electrical Code and any applicable local codes. All IAS wiring shall be installed in the conduit types allowed by the National Electrical Code or applicable local codes. Where IAS plenum rated cable wiring is allowed it shall be run parallel to or at right angles to the structure, properly supported and installed in a neat and workmanlike manner.

WARRANTY

Equipment, materials and workmanship incorporated into the work shall be warranted for a period of one year from the time of "substantial completion". Within this period, upon notice by the Owner, any defects in the work provided under this section due to faulty materials, methods of installation or workmanship shall be promptly (within 48 hours after receipt of notice) repaired or replaced by the Section 23 09 25 contractor at no expense to the Owner.

ACCEPTANCE TESTING

Upon completion of the installation, the Section 23 09 25 contractor shall load all system software.

OPERATOR INSTRUCTION, TRAINING

This section contactor shall provide on-site operator instruction to the owner's operating personnel. Operator instruction shall be done during normal working hours and shall be performed by a competent representative familiar with the system hardware, software and accessories.

END OF SECTION

SECTION 23 22 13
STEAM AND CONDENSATE PIPING

P A R T 1 - G E N E R A L

SCOPE
This section contains specifications for steam and condensate heating piping for this project.

RELATED WORK
Section 23 05 23 - General-Duty Valves for HVAC Piping
Section 23 05 15 - Piping Specialties
Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment
Section 23 07 00 - HVAC Insulation

REFERENCE STANDARDS

ANSI B16.4	Cast Iron Threaded Fittings
ANSI B16.5	Pipe Flanges and Flanged Fittings
ASTM A53	Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless
ASTM A105	Forgings, Carbon Steel, for Piping Components

SHOP DRAWINGS
Contractor shall 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.

TYPE F STEEL PIPE:
Statement from manufacturer on his letterhead that the pipe furnished meets the ASTM specification contained in this section.

QUALITY ASSURANCE
Any installed material not meeting the specification requirements must be replaced with material that meets these specifications without additional cost to the Owner.

DELIVERY, STORAGE, AND HANDLING
Promptly inspect shipments to insure that the material is undamaged and complies with specifications.

Cover pipe to eliminate 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. Protect fittings, flanges, and unions by storage inside or by durable, waterproof, above ground packaging.

DESIGN CRITERIA
Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM specifications as listed in this specification.

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.

Where weld fittings 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, ASTM A53 grade A type E or S, or ASTM A53 grade B, type E or S may be substituted at Contractor's option. Where ASTM A53 grade A pipe is specified, ASTM A53 grade B pipe may be substituted at Contractor's option. Where the grade or type is not specified, Contractor may choose from those commercially available.

WELDER QUALIFICATIONS

Welding procedures, welders, and welding operators for all building service piping and steam piping less than or equal to 15 psig to be in accordance with certified welding procedures of the National Certified Pipe Welding Bureau.

The Owner reserves the right to test the work of any welder employed on the project, at the Contractor'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.

P A R T 2 - P R O D U C T S

LOW PRESSURE STEAM (15 psig and lower)
2" and Smaller above grade in buildings: ASTM A53, type F, standard weight (schedule 40) black steel pipe with ASTM A126/ANSI B16.4, Class 125 cast iron threaded fittings.

2-1/2" and Larger: ASTM A53, standard weight (schedule 40) black steel pipe with ASTM A234 grade WPB/ANSI B16.9 standard weight, seamless, carbon steel weld fittings.

LOW PRESSURE STEAM CONDENSATE (Steam pressure 15 psig and lower)
2" and Smaller above grade in buildings: ASTM A53, type F, extra strong (schedule 80) black steel pipe with ASTM A126/ANSI B16.4, Class 125 cast iron threaded fittings.

2-1/2"and Larger: ASTM A53, extra strong (schedule 80) black steel pipe with ASTM A234 grade WPB/ANSI B16.9, extra strong, seamless, carbon steel weld fittings.

UNIONS AND FLANGES
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 ANSI B16.18 cast copper alloy unions on copper 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 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.

GASKETS
Steam Systems and high pressure steam condensate systems: Spiral wound gasket with external ring to prevent gasket blowout, ASME B16.20. Suitable for use with flat face and raised face flanges. 304 stainless steel/non-asbestos filler/carbon steel outer guide ring,. Filler to be graphite or PTFE on low pressure systems, 900 degree F graphite or ceramic on high pressure steam. Flexitallic Style CG, Leader Style SR, Garlock Flexseal or approved equal.

P A R T 3 - E X E C U T I O N

PREPARATION
Remove all foreign material from interior and exterior of pipe and fittings.

ERECTION
Install all piping parallel to building walls and ceilings.

Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and contract without damage to itself, equipment, or building.

Mitered ells, notched tees, and orange peel reducers are not acceptable. On threaded piping, bushings are not acceptable.

"Weldolets" and "Threadolets" may be used for branch takeoffs up to one-half (1/2) the diameter of the main.

Install all valves, control valves, and piping specialties, including items furnished by others, as specified and/or detailed. Make connections to all equipment installed by others where that equipment requires the piping services indicated in this section.

WELDED PIPE JOINTS

Make all welded joints by fusion welding in accordance with ASME Codes, ANSI B31, and State Codes where applicable.

Electrodes shall be Lincoln, or approved equal, with coating and diameter as recommended by the manufacturer for the type and thickness of work being done.

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.

STEAM AND STEAM CONDENSATE

Pitch mains down 1 inch in 40 feet in the direction of flow unless otherwise indicated on the drawings. Pitch terminal equipment runouts down 1 inch in 2 feet for proper condensate drainage.

Use eccentric fittings for changes in horizontal pipe sizes with the fittings installed for proper condensate drainage. Concentric fittings may be used for changes in vertical pipe sizes.

Use a minimum of two elbows in each pipe line to a piece of terminal equipment to provide flexibility for expansion and contraction of the piping system. Offset pipe connections at equipment to allow for service, such as removal of the terminal device.

Install flanges, taps, vents and drains needed to fill, vent and drain the piping for hydrostatic testing.

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.

GASKETS

Store horizontally in cool, dry location and protect from sunlight, water and chemicals. Inspect flange surfaces for warping, radial scoring or heavy tool marks. Inspect fasteners, nuts and washers for burrs or cracks. Replace defective materials.

Align flanges parallel and perpendicular with bolt holes centered without using excessive force. Center gasket in opening. Lubricate fastener threads, nuts and washers with lubricant formulated for application.

Draw flanges together evenly to avoid pinching gasket. Tighten fasteners in cross pattern sequence (12 – 6 o'clock, 3 – 9 o'clock, etc.), one pass by hand and four passes by torque wrench at 30% full torque, 60% full torque and two passes at full torque per ASME B16.5.

PIPING SYSTEM LEAK TESTS

Conduct piping tests by visual observation for 48 hours under system operating pressure. Owners representative shall also observe the system piping tests.

Do not insulate pipe until it has been successfully tested.

All pressure tests are to be documented on a form included in this specification.

END OF SECTION

PIPING SYSTEM TEST REPORT

Dane County
Department of Public Works **Date Submitted:** _____

Project Name: _____

Location: _____ **Project No:** _____

Contractor: _____

☐ **HVAC** ☐ **Refrigeration** ☐ **Controls**

☐ **Power Plant** ☐ **Plumbing** ☐ **Sprinkler**

Test Medium: ☐ **Air** ☐ **Water** ☐ **Other** _____

Test performed per specification section No. _____

Specified Test Duration _____ **Hours** **Specified Test Pressure** _____ **PSIG**

System Identification: _____

Describe Location: _____

_____

Test Date: _____

Start Test Time: _____ **Initial Pressure:** _____ **PSIG**

Stop Test Time: _____ **Final Pressure:** _____ **PSIG**

Tested By: _____ **Witnessed By:** _____

Title: _____ **Title:** _____

Signed: _____ **Signed:** _____

Date: _____ **Date:** _____

Comments: _____

_____

_____

_____

SECTION 26 05 00
COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

The electrical work included in all other divisions is the responsibility of the contractor performing the division 26 work unless noted otherwise.

SCOPE

The work under this section includes basic electrical requirements, which are applicable to all Division 26 sections. This section includes information common to two or more technical specification sections or items that are of a general nature, not conveniently fitting into other technical sections. Included are the following topics:

PART 1 - GENERAL
- Project Overview
- Scope
- Related Work
- Reference Standards
- Regulatory Requirements
- Quality Assurance
- Continuity of Existing Services and Systems
- Protection of Finished Surfaces
- Approved Electrical Testing Laboratories
- Intent
- Omissions
- Submittals
- Project/Site Conditions
- Work Sequence and Scheduling
- Work by Other Trades
- Offsite Storage
- Request and Certificate for Payment
- Salvage Materials
- Certificates and Inspections
- Operating and Maintenance Data
- Record Drawings

PART 2 - PRODUCTS
- Identification

PART 3 - EXECUTION
- Cutting and Patching
- Building Access
- Equipment Access
- Coordination
- Housekeeping and Clean Up
- Training

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.

REFERENCE STANDARDS

Abbreviations of standards organizations referenced in this and other sections are as follows:

ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
EPA	Environmental Protection Agency
ETL	Electrical Testing Laboratories, Inc.
NBS	National Bureau of Standards
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
UL	Underwriters Laboratories Inc.

REGULATORY REQUIREMENTS
All work and materials are to conform in every detail to applicable rules and requirements of the Wisconsin State Electrical Code Volumes 1 and 2, the National Electrical Code (ANSI/NFPA 70), other applicable National Fire Protection Association codes, the National Electrical Safety Code, and present manufacturing standards (including NEMA).

All Division 26 work shall be done under the direction of a currently certified State of Wisconsin Certified Master Electrician.

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, except medium voltage equipment and components, 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 Owner, 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, except for medium voltage equipment and components, shall be so labeled.

CONTINUITY OF EXISTING SERVICES AND SYSTEMS
No outages shall be permitted on existing systems except at the time and during the interval specified by the Owner. The institution may require written approval. Any outage must be scheduled when the interruption causes the least interference with normal institutional schedules and business routines. No extra costs will be paid to the Contractor for such outages which must occur outside of regular weekly working hours.

This Contractor shall restore any circuit interrupted as a result of this work to proper operation as soon as possible. Note that institutional operations are on a seven-day week schedule.

PROTECTION OF FINISHED SURFACES
Furnish one can of touch-up paint for each different color factory finish furnished by the Contractor. Deliver touch-up paint with other "loose and detachable parts" as covered in the Section - Basic Requirements.

APPROVED ELECTRICAL TESTING LABORATORIES
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.

INTENT
The Contractor shall 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, the Contractor shall furnish the item, system, or workmanship, which is the highest quality, largest, or most closely fits the A/E's intent (as determined by the A/E). Refer to the General Conditions of the Contract for further clarification.

It must be understood that the details and drawings are diagrammatic. The Contractor shall verify all dimensions at the site and be responsible for their accuracy.

All sizes as given are minimum except as noted.

Materials and labor shall be new (unless noted or stated otherwise), first class, and workmanlike, and shall be subject at all times to the Owner's and/or A/E'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.

OMISSIONS

No later than ten (10) days before bid opening, the Contractor shall call the attention of the A/E to any materials or apparatus the Contractor believes to be inadequate and to any necessary items of work omitted.

SUBMITTALS

Submit for all equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number. 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. 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 A/E, the successful bidder shall furnish additional drawings, illustrations, catalog data, performance characteristics, etc.

Submittals shall be grouped 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 equipment data sheets and shop drawings to allow the following distribution:

- Insertion into Operating and Maintenance Manuals 2 copies
- Dane County Public Works - record copy 1 copy
- Engineers - record copies 2 copies

PROJECT/SITE CONDITIONS

Install Work in locations shown on Drawings, unless prevented by Project conditions.

Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Owner before proceeding.

Tools, materials and equipment shall be confined to areas designated by the Owner.

WORK SEQUENCE AND SCHEDULING

Install work in phases to accommodate the Owner's occupancy requirements. During the construction period coordinate electrical schedule and operations with the Owner.

WORK BY OTHER TRADES

Every attempt has been made to indicate in this trade's specifications and drawings all work required of this Contractor. However, there may be additional specific paragraphs in other trade specifications and addenda, and additional notes on drawings for other trades which pertain to this Trade's 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.

SALVAGE MATERIALS

No materials removed from this project shall be reused except as specifically noted on drawings. All materials removed shall become the property of and shall be disposed of by the Contractor.

CERTIFICATES AND INSPECTIONS
Obtain and pay for all required State installation inspections in accordance with Wis. Adm. Code Section Comm. 61.30. Deliver originals of these certificates to the Owner.

OPERATION AND MAINTENANCE DATA
All operations and maintenance data shall comply with the submission and content requirements specified under section - Basic Requirements.

Two copies of Operations and Maintenance Manuals shall be provided for the following distribution:

Dane County Public Works	1 copy
Dane County Facilities Management	1 copy

In addition to the general content specified under Section - Basic Requirements. supply the following additional documentation:

1. Manufacturer's wiring diagrams for electrically powered equipment.

RECORD DRAWINGS
The Contractor shall maintain at least one copy each of the specifications and drawings on the job site at all times.

The Owner will provide the Contractor with a suitable set of contract drawings on which daily records of changes and deviations from contract shall be recorded. Dimensions and elevations on the record drawings shall locate all buried or concealed piping, conduit, or similar items.

The daily record of changes shall be the responsibility of Contractor's field superintendent. No arbitrary mark-ups will be permitted.

At completion of the project, the Contractor shall submit the marked-up record drawings to the Owner prior to final payment.

PART 2 - PRODUCTS

IDENTIFICATION
See Electrical section 26 05 53 – Identification for Electrical Systems.

PART 3 - EXECUTION

CUTTING AND PATCHING
Refer to Division 1, Section - Basic Requirements., Cutting and Patching.

BUILDING ACCESS
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 by this contractor, restore any opening to its original condition after the apparatus has been brought into the building.

EQUIPMENT ACCESS
Install all piping, conduit, ductwork, and accessories to permit access to equipment for maintenance. Coordinate the exact location of wall and ceiling access panels and doors with the General Contractor, making sure that access is available for all equipment and specialties. Where access is required in plaster or drywall walls or ceilings, furnish the access doors to the General Contractor and reimburse the General Contractor for installation of those access doors.

COORDINATION
The Contractor shall cooperate with other trades and Owner's personnel in locating work in a proper manner. 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 to the Owner, provided such decision is reached prior to actual installation. The Contractor shall check location of electrical outlets with respect to other installations before installing.

The Contractor shall 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.

Coordinate all work with other contractors prior to installation. 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.

HOUSEKEEPING AND CLEAN UP

The Contractor shall 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.

TRAINING

Contractor to provide field personnel knowledgeable with the operations, maintenance and troubleshooting of the system and/or components defined within this section.

END OF SECTION

SECTION 26 05 02
ELECTRICAL DEMOLITION FOR REMODELING

PART 1 - GENERAL

SCOPE
The work under this section includes all electrical demolition work as shown on drawings. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work

PART 2 - PRODUCTS
- Material and Equipment

PART 3 - EXECUTION
- Examination
- Preparation
- Demolition and Extension of the Existing Electrical Work
- Cleaning and Repair
- Installation

RELATED WORK
Applicable provisions of Division 1 govern work under this Section.

PART 2 - PRODUCTS

MATERIALS AND EQUIPMENT
Materials and equipment for patching and extending work as specified in the individual Sections.

PART 3 - EXECUTION

EXAMINATION
Verify field measurements and circuiting arrangements as shown on Drawings.

Verify that abandoned wiring and equipment serve only abandoned facilities.

Demolition Drawings are based on casual field observation and/or existing record documents. Report discrepancies to the A/E and Owner before disturbing existing installation.

Beginning of demolition means installer accepts existing conditions.

PREPARATION
Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.

Coordinate utility service outages with the Owner and A/E. Also, if applicable, coordinate utility service outages with the local Utility Company.

Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations. In particular, all security and safety systems must be maintained in operation at all times as required by the Owner. This includes security and safety lighting.

Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from the Owner at least 48 hours before partially or completely disabling system. Minimize outage duration. If required, make temporary connections to maintain service in areas adjacent to work area.

DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK
Demolish and extend existing electrical work to meet all requirements of these specifications.

If certain raceways and boxes are abandoned but not scheduled for removal, those items must be shown on the "As Built Drawings".

Remove, relocate, and extend existing installations to accommodate new construction.

Remove abandoned wiring to source of supply.

Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

Repair adjacent construction and finishes damaged during demolition and extension work.

Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

Extend existing installations using materials and methods compatible with existing electrical installations, or as specified. This includes the extension of the circuit from the last active device to the next device in the system to be activated.

CLEANING AND REPAIR

Clean and repair existing materials and equipment which remain or are to be reused.

Switchboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions.

INSTALLATION

Install relocated materials and equipment under the provisions of other sections.

END OF SECTION

SECTION 26 05 04
CLEANING, INSPECTION, AND TESTING OF ELECTRICAL EQUIPMENT

PART 1 - GENERAL

SCOPE

The work under this section includes the required cleaning, repair, adjustment, calibration, maintenance and testing of electrical equipment, as specified herein. This applies only to new electrical and existing electrical equipment being furnished, modified, worked on or serviced by this contractor for this project. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work

PART 2 - PRODUCTS
- Not Used

PART 3 - EXECUTION
- General Inspection and Cleaning of all Equipment
- Grounding Systems
- Cables
- Panelboards
- Motor Starters

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

GENERAL INSPECTION AND CLEANING OF ALL ELECTRICAL EQUIPMENT

Inspect for physical damage and abnormal mechanical and electrical conditions.

Any item found to be out of tolerance, or in any other way defective as a result of the required testing, shall be reported to the A/E. Procedure for repair and/or replacement will be outlined. After appropriate corrective action is completed the item shall be re-tested.

Compare equipment nameplate information with the latest single line diagram and report any discrepancies.

Verify proper auxiliary device operation and indicators.

Check tightness of accessible bolted electrical joints. Use torque wrench method.

Make a close examination of equipment and remove any shipping brackets, insulation, packing, etc. that may not have been removed during original installation.

Make a close examination of equipment and remove any dirt or other forms of debris that may have collected in existing equipment or in new equipment during installation.

Clean All Equipment:
- Vacuum inside of panelboards, etc.
- Loosen attached particles and vacuum them away.
- Wipe all insulators with a clean, dry, lint free rag.
- Clean insulator grooves.
- Re-vacuum inside surfaces as directed by the Owner’s Representative or Inspector

Inspect equipment anchorage.

Inspect equipment and bus alignment.

Check all heater elements for operation and control.

Lubricate nonelectrical equipment per manufacturer's recommendations.

GROUNDING SYSTEMS

Inspect the ground system for adequate termination at all devices.

CABLES

Visual and Mechanical Inspections:

Inspect exposed sections for physical damage.

Verify cable is supplied and connected in accordance with single line diagram.

Inspect for shield grounding, cable support and termination.

Inspect for visual jacket and insulation condition.

Visible cable bends shall be checked against ICEA or manufacturer's minimum allowable bending radii -- 12 times the diameter for tape shielded cables.

Inspect for proper fireproofing in common cable areas.

There shall be NO tests performed on existing cable without specific direction from the Consulting Engineer.

Electrical Tests -- Below 600 Volts:

All secondary cables from the substation transformers to the secondary switchboards shall be subjected to insulation tests using a 500 vdc megger.

Visually inspect cables, lugs, connectors and all other components for physical damage and proper connections

Check all cable connectors for tightness (with a torque wrench) and clearances. Torque test conductor and bus terminations to manufacturer's recommendations.

Check for proper grounding resistance at all services and at transformers. Resistance shall be 2 ohms maximum.

PANELBOARDS

Torque all the connections per the manufacturers spec. Verify phase wires, color coding, separate neutral and mechanical bonding. Verify circuit breaker operation. Verify the directory.

MOTOR STARTERS

Verify the control circuits. Confirm the fusing and the grounding of the control transformers. Torque all of the connections. Confirm the overload elements and the circuit breakers for proper sizing. Verify all grounding. Operate and test each motor starter for proper operation.

END OF SECTION

SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLE

PART 1 - GENERAL

SCOPE
The work under this section includes furnishing and installing required wiring and cabling systems including pulling, terminating and splicing. Included are the following topics:

RELATED WORK
Applicable provisions of Division 1 govern work under this Section.

Section 26 05 33 – Raceway and Boxes for Electrical Systems.
Section 26 05 53 – Identification for Electrical Systems.

REFERENCES
NFPA 70 - National Electrical Code.

SUBMITTALS
Submit product data: Provide for each cable assembly type.

Submit factory test reports: Indicate procedures and values obtained.

Submit shop drawings for modular wiring system including layout of distribution devices, branch circuit conduit and cables, circuiting arrangement, and outlet devices.

Submit manufacturer's installation instructions. Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

PROJECT CONDITIONS
Verify that field measurements are as shown on Drawings.

Conductor sizes are based on copper.

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.

PART 2 - PRODUCTS

GENERAL

All wire shall be new, delivered to the site in unbroken cartons and shall be less than one year old out of manufacturer's stock.

All conductors shall be copper.

Insulation shall have a 600 volt rating.

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.

BUILDING WIRE

Description: Single conductor insulated wire.

Insulation: Type THHN/THWN, XHHW-2 insulation for feeders and branch circuits.
Type XHHW-2 insulation for feeders with aluminum conductors.

WIRING CONNECTORS

Split Bolt Connectors: Not acceptable.

Solderless Pressure Connectors: High copper alloy terminal. May be used only for cable termination to equipment pads or terminals. Not approved for splicing.

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.

PART 3 - EXECUTION

GENERAL WIRING METHODS

All wire and cable shall be installed in conduit.

Do not use wire smaller than 12 AWG for power and lighting circuits.

All conductors shall be sized to prevent excessive voltage drop at rated circuit ampacity.

Make conductor lengths for parallel conductors equal.

Splice only in junction or outlet boxes.

Identify ALL low voltage, 600v and lower, wire per section 26 05 53.

Neatly train and lace wiring inside boxes, equipment, and panelboards.

WIRING INSTALLATION IN RACEWAYS

Pull all conductors into a raceway at the same time. Use Listed wire pulling lubricant for pulling 4 AWG and larger wires and for other conditions when necessary.

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.

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 two feet (600 mm) of the conductor.

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 conductor.

Thoroughly clean wires before installing lugs and connectors.

At all splices and terminations, leave tails long enough to cut splice out and completely re-splice.

FIELD QUALITY CONTROL

Field inspection and testing will be performed under provisions of Section 26 05 04.

Additional testing as follows shall be performed if aluminum conductors are used:

Equipment terminated with aluminum conductors shall be tested with a thermal imager and recorded.

Conductors shall be closely checked for loose or poor connections, and for signs of overheating or corrosion.

Test procedures shall meet NETA guidelines.

Test results and report shall be provided to the engineer.

Contractor shall correct all deficiencies reported in the test report.

WIRE COLOR

General:

For wire sizes 8 AWG and larger – Use colored wire, or identify wire with colored tape at all terminals, splices and boxes. Colors to be as indicated below.

In existing facilities, use existing color scheme.

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.

Feeder Circuit Conductors: Each phase shall be uniquely color coded.

Ground Conductors: Green for 6 AWG and smaller. For 4 AWG and larger, identify with green colored wire, or 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.

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

SCOPE

The work under this section includes equipment grounding conductors and connections. Included are the following topics:

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.

REFERENCES

NFPA 70 - National Electrical Code.

ANSI/IEEE 142 (Latest edition) - Recommended Practice for Grounding of Industrial and Commercial Power Systems.

SUBMITTALS

Product Data: Provide data for all connections.

Manufacturer's Instructions: Include instructions for preparation, installation and examination of exothermic connectors.

PROJECT RECORD DOCUMENTS

Accurately record actual locations of grounding electrodes.

REGULATORY REQUIREMENTS

Conform to requirements of NFPA 70.

Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

PART 2 - PRODUCTS

MECHANICAL CONNECTORS

The mechanical connector bodies shall be manufactured from high strength, high conductivity cast copper alloy material. Bolts, nuts, washers and lockwashers shall be made of Silicon Bronze and supplied as a part of the connector body and shall be of the two bolt type.

Split bolt connector types are NOT allowed. Exception: the use of split bolts is acceptable for grounding of wire-basket type cable tray, and for cable shields/straps of medium voltage cable.

The connectors shall meet or exceed UL 467 and be clearly marked with the catalog number, conductor size and manufacturer.

COMPRESSION CONNECTORS
The compression connectors shall be manufactured from pure wrought copper. The conductivity of this material shall be no less than 99% by IACS standards.

The connectors shall meet or exceed the performance requirements of IEEE 837, latest revision.

The installation of the connectors shall be made with a compression, tool and die system, as recommended by the manufacturer of the connectors.

The connectors shall be clearly marked with the manufacturer, catalog number, conductor size and the required compression tool settings.

Each connector shall be factory filled with an oxide-inhibiting compound.

WIRE
Material: Stranded copper (aluminum not permitted).

Feeder Equipment Ground: Size as shown on drawings, specifications or as required by NFPA 70, whichever is larger. Differentiate between the normal ground and the isolated ground when both are used on the same facility.

PART 3 - EXECUTION

GENERAL
Install Products in accordance with manufacturer's instructions.

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.

LESS THAN 600 VOLT SYSTEM GROUNDING
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.

FIELD QUALITY CONTROL
Inspect grounding and bonding system conductors and connections for tightness and proper installation.

END OF SECTION

SECTION 26 05 29
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

SCOPE
The work under this sections includes conduit and equipment supports, straps, clamps, steel channel, etc, and fastening hardware for supporting electrical work. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Submittals
- Quality Assurance

PART 2 - PRODUCTS
- Material

PART 3 - EXECUTION
- Installation

RELATED WORK
Applicable provisions of Division 1 govern work under this Section.

SUBMITTALS
Product Data: Provide data for support channel.

QUALITY ASSURANCE
Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

PART 2 - PRODUCTS

MATERIAL
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 ¼" 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.

PART 3 - EXECUTION

INSTALLATION
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.

Power-actuated fasteners and plastic wall anchors are not permitted.

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 Owner.

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.

Install surface-mounted cabinets and panelboards with minimum of four anchors. Provide steel channel supports to stand cabinet one inch (25 mm) off wall (7/8" Uni-strut or ¾" painted, fire-retardant plywood is acceptable).

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, catwalks, walkways etc.

END OF SECTION

SECTION 26 05 33
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

SCOPE
The work under this section includes conduits and boxes for electrical systems. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Submittals

PART 2 - PRODUCTS
- Electrical Metallic Tubing (EMT) and Fittings
- Liquidtight Flexible Metal Conduit and Fittings
- Conduit Supports
- Pull and Junction Boxes
- General

PART 3 - EXECUTION
- Conduit Sizing, Arrangement and Support
- Conduit Installation
- Conduit Installation Schedule
- Coordination of Box Locations
- Pull and Junction Box Installation
- Construction Verification Items

RELATED WORK
Applicable provisions of Division 1 govern work under this section.

Section 26 05 29 – Hangers and Supports for Electrical Systems.

SUBMITTALS
Boxes - provide product data showing configurations, finishes, dimensions, and manufacturer's instructions.

PART 2 - PRODUCTS

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.

LIQUIDTIGHT FLEXIBLE METAL CONDUIT 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.

CONDUIT SUPPORTS
See section 26 05 29.

PULL AND JUNCTION BOXES
Pull boxes and junction boxes shall be minimum 4 inch square (100 mm) by 2 1/8th 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 or larger, pull and junction boxes shall be sized per NEC but not less than 4 11/16 inch square (117 mm).

Sheet Metal Boxes: code gauge galvanized steel, screw covers, flanged and spot welded joints and corners.

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.

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.

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.

PART 3 - EXECUTION

CONDUIT SIZING, ARRANGEMENT, AND SUPPORT
EMT is permitted to be used in sizes 4" (50 mm) and smaller for power and telecommunication 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 1/2 inch (13 mm) minimum except **all homerun conduits shall be ¾”,** or as specified elsewhere. **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.**

Size conduit for all other wiring, including but not limited to data, control, security, fire alarm, telecommunications, signal, video, etc. shall be sized per number of conductors pulled and their cross-section. 40% fill shall be maximum for all new conduit fills.

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.

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 (30 meters) without a junction box.

All conduits installed in exposed areas shall be installed with a box offset before entering box.

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.

All conduit terminations (except for terminations into conduit bodies) shall use 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. Refer to Section 26 05 26 – Grounding and Bonding for Electrical Systems for grounding bushing requirements.

Install no more than the equivalent of three 90 degree bends between boxes.

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.

Conduit shall be bent according to manufacturers recommendations.

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.

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.

Ground and bond conduit under provisions of Section 26 05 26.

Identify conduit under provisions of Section 26 05 53.

CONDUIT INSTALLATION SCHEDULE

Conduit other than that specified below for specific applications shall not be used.

Exposed Dry Interior Locations: Electrical metallic tubing.

Motor and equipment connections: Flexible PVC coated metal conduit (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.

COORDINATION OF BOX LOCATIONS

Provide electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance.

Electrical box locations shown on Contract Drawings are approximate unless dimensioned. Verify location of floor boxes and outlets in offices and work areas prior to rough-in.

No outlet, junction, or pull boxes shall be located where it will be obstructed by other equipment, piping, lockers, benches, counters, etc.

Boxes shall not be fastened to the metal roof deck.

It shall be the Contractor's responsibility to study drawings pertaining to other trades, to discuss location of boxes with workmen installing other piping and equipment and to fit all electrical outlets to job conditions.

In case of any question or argument over the location of a box, the Contractor shall refer the matter to the A/E and install outlet as instructed by the A/E.

The proper location of each outlet is considered a part of this contract and no additional compensation will be paid to the Contractor for moving outlets which were improperly located.

Locate and install boxes to allow access to them. Where installation is inaccessible, coordinate locations and provide 18 inch (450 mm) by 24 inch (600 mm) access doors.

Locate and install to maintain headroom and to present a neat appearance.

Install boxes to preserve fire resistance rating of partitions and other elements, using approved materials and methods.

PULL AND JUNCTION BOX INSTALLATION

Locate pull boxes and junction boxes above accessible ceilings, in unfinished areas or furnish and install Owner approved access panels in non-accessible ceilings where boxes are installed. All boxes are to be readily-accessible.

Support pull and junction boxes independent of conduit.

END OF SECTION

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

SCOPE
The work under this section includes the products and execution requirements relating to labeling of power wire and cabling. Further, this section includes labeling of all terminations and related sub-systems, including but not limited to nameplates and stenciling, Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Submittals

PART 2 - PRODUCTS
- Materials

PART 3 - EXECUTION
- General
- Junction and Pullbox Identification
- Power and Control Wire Identification
- Nameplate Engraving

RELATED WORK
Applicable provisions of Division 1 shall govern work under this section.

Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables

SUBMITTALS
Include schedule for nameplates and stenciling.

Prior to installation, the Contractor shall provide samples of all label types planned for the project. These samples shall include examples of the lettering to be used. Samples shall be mounted on 8 1/2" x 11" sheets annotated, explaining their purposed use.

PART 2 - PRODUCTS

MATERIALS
Labels: All labels shall be permanent, and machine generated. NO HANDWRITTEN OR NON-PERMANENT LABELS ARE ALLOWED. Exception: back side of device plates and junction boxes may use handwritten, legible labeling on box covers, unless specifically prohibited by other specification sections.

Cable label size shall be appropriate for the conductor or cable size(s), outlet faceplate layout and patch panel design. All labels shall be self-laminating, white/transparent vinyl and be wrapped around the cable or sheath. Labels for power conductors (600V and lower) shall be cloth-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.

Nameplates: Engraved three-layer laminated plastic, black letters on a white background.

Tape (phase identification only): Scotch #35 tape in appropriate colors for system voltage and phase.

Adhesive type labels not permitted except for phase and wire identification. Machine generated adhesive labels shall be permitted for device plates, 4-11/16" and smaller junction boxes, Fire alarm and control devices.

PART 3 - EXECUTION

GENERAL
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 must be labeled for voltage in addition to other requirements listed herein.

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.

JUNCTION AND PULLBOX IDENTIFICATION

The following junction and pullboxes shall be identified utilizing spray painted covers:

System	Color(s)
Secondary Power – 208Y/120V, 240/120V	White

Provide circuit numbers, and source panel designations for power wiring. Other system shall be identified as shown on details or approved shop drawings. Temperature control shall identify the source.

POWER AND CONTROL WIRE IDENTIFICATION

Provide wire markers 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 control wire number as indicated on schematic and interconnection diagrams or equipment manufacturer's shop drawings for control 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.

NAMEPLATE ENGRAVING

Provide nameplates of minimum letter height as scheduled below.

Equipment Enclosures: 1 inch (25 mm); identify equipment designation.

Individual Circuit Breakers, Disconnect Switches, Enclosed Switches, and Motor Starters: ½ inch (13 mm); identify source and load served.

Junction boxes: 1 inch (25 mm); identify system source(s) and load(s) served. Junction boxes may be neatly identified using a permanent marker.

END OF SECTION

SECTION 26 29 00
LOW-VOLTAGE CONTROLLERS

PART 1 - GENERAL

SCOPE
The work under this section includes manual motor starters. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Coordination With Other Trades
- References
- Submittals
- Operation and Maintenance Data
- Delivery, Storage, and Handling

PART 2 - PRODUCTS
- Manual Motor Starters

PART 3 - EXECUTION
- Installation

RELATED WORK
Applicable provisions of Division 1 shall govern work under this Section.

Section 26 05 29 – Hangers and Supports for Electrical Systems.

COORDINATION WITH OTHER TRADES
Motors: In general, all electric motors required for this installation will be supplied with equipment, apparatus and/or appliances covered under other sections of the specifications.

For the sake of consistency and conformity of manufacturer, design and construction, all motors shall conform to the following description unless otherwise noted or required.

- Motors 1/3 HP and smaller shall be wound for operation on single phase, 60 Hz. service unless otherwise noted.
- Motors 1/2 HP and above shall be wound for operation on 3 phase, 60 Hz service unless otherwise noted.
- Refer to drawings in each case in order to verify voltage characteristics required.

Equipment:
All building utility motors such as fans, pumps, etc., together with certain "controlling equipment" for same, except motor starters and related apparatus, will be furnished under other sections of the specifications and delivered to the building site unless specifically noted otherwise. The above mentioned "controlling equipment" pertains to electrical thermostats, electro-pneumatic and pneumatic-electric and detection devices, or any other device not purely electrically operating in nature.

The starters for these motors shall be furnished and installed by the Electrical Trade unless noted otherwise.

The Electrical Trade shall set and connect all specified starting equipment, install all power conduits and wiring and shall furnish and make all connections from starting equipment to motors as required to leave the apparatus in running condition.

Wiring Connections:
Furnish branch circuits for all motors to the starting equipment and then to the motors, complete with all control wiring for automatic and remote control where required or noted. Conduits to motors shall terminate in the conduit fittings on the motors, the final connection being made with flexible, liquid-tight conduit, seal-tight "UA", or as approved.

Provide all necessary labor and material to completely connect all electrical motors and controls (where required) in connection with the building utility equipment, including fans, pumps, overhead door operators, etc.

All conduits and wiring required for control work from the holding coil circuit of the starter, including the furnishing and installation of control devices such as auxiliary contacts, control relays, time delay relays, pilot lights, selector switches, alternators, etc., shall be provided and installed by other trades unless otherwise indicated.

Power Branch Circuits:
Wire sizes for branch circuits not specifically called for on drawings or in specifications shall be based on 125 percent of the full load current of the motor unless the voltage drop of motor branch circuits exceeds 1-1/2 percent from the distribution panel to the motor; in which case, voltage drop shall govern wire sizes. A power factor of 80 percent shall be used for motors in such calculations.

REFERENCES
ANSI/NEMA ICS 6 - Enclosures for Industrial Controls and Systems.
NEMA AB 1 - Molded Case Circuit Breakers.
NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies.
NEMA KS 1 - Enclosed Switches.

SUBMITTALS
Provide product data on motor starters, pilot devices, and switching and overcurrent protective devices.

OPERATION AND MAINTENANCE DATA
Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

DELIVERY, STORAGE, AND HANDLING
Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to motor control center components, enclosure, and finish.

PART 2 - PRODUCTS

MANUAL MOTOR STARTERS
Manual Motor Starter: NEMA ICS 2; size as shown on Drawings. AC general-purpose Class A manually operated full-voltage controller for induction motors rated in horsepower, with overload protection, red pilot light and toggle operator.

Enclosure: NEMA Type: 1.

Provide manufacturer’s equipment ground kit in all starter enclosures.

PART 3 - EXECUTION

INSTALLATION
Install motor control equipment in accordance with manufacturer's instructions.

Select and install heater elements in motor starters to match installed motor characteristics.

Motor Data: Provide neatly typed label on each motor starter enclosure identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating.

END OF SECTION

DOMESTIC HOT WATER SYSTEM REPLACEMENT WITH HEAT RECOVERY RFB NO. 310033

DANE COUNTY DEPARTMENT OF PUBLIC
WORKS, HIGHWAY AND TRANSPORTATION
CITY COUNTY BUILDING
210 MARTIN LUTHER KING JR. BLVD.
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MAP OF WISCONSIN

SHEET INDEX

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Project No. 10-0506

Notes:

Date	Issuance/Revisions	Symbol
11/2/10	ISSUED FOR BIDDING	
9/1/10	ISSUED FOR REVIEW	

DOMESTIC HOT WATER SYSTEM REPLACEMENT WITH HEAT RECOVERY

DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HIGHWAY AND TRANSPORTATION
CITY COUNTY BUILDING
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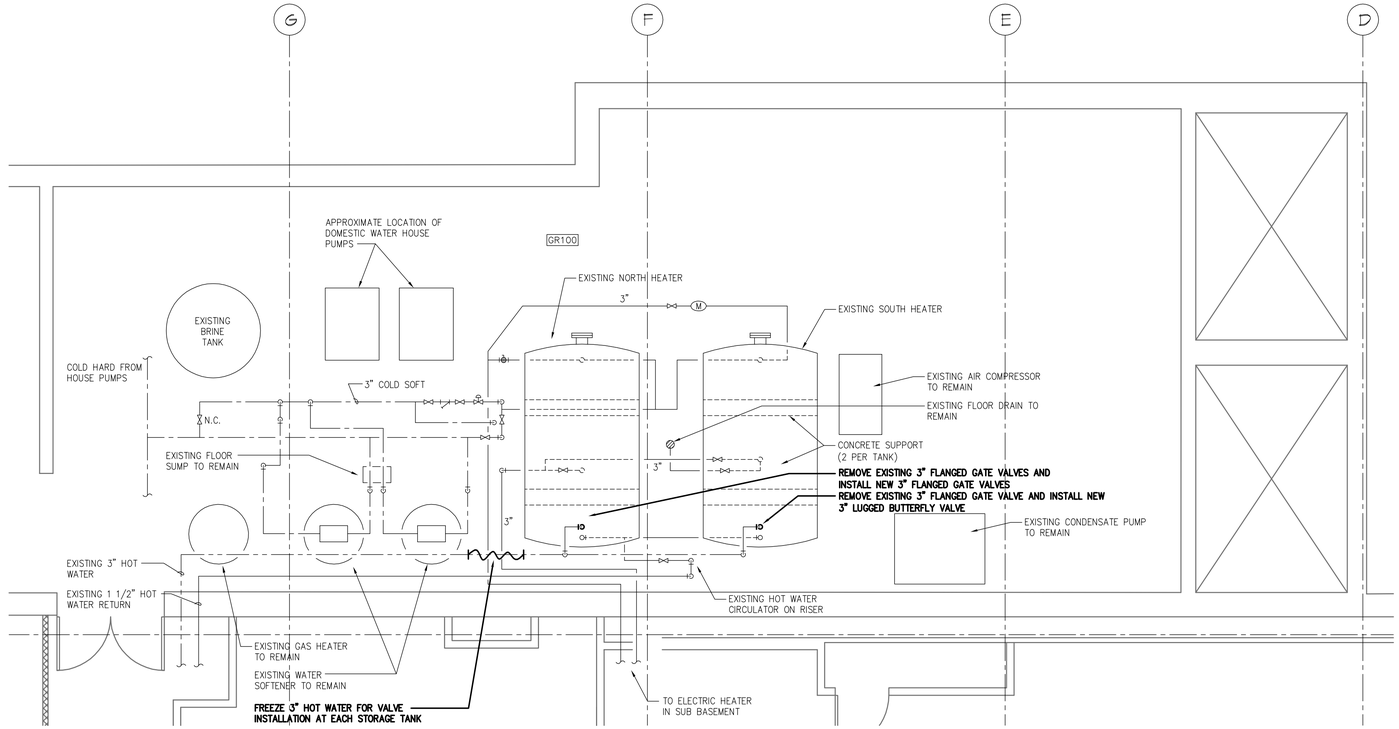
MADISON, WI 53703

Drawing Title:
TITLE SHEET

Eng. 370 Project Number: 10-0506
Drawn By: FBN
Drawing No. T100

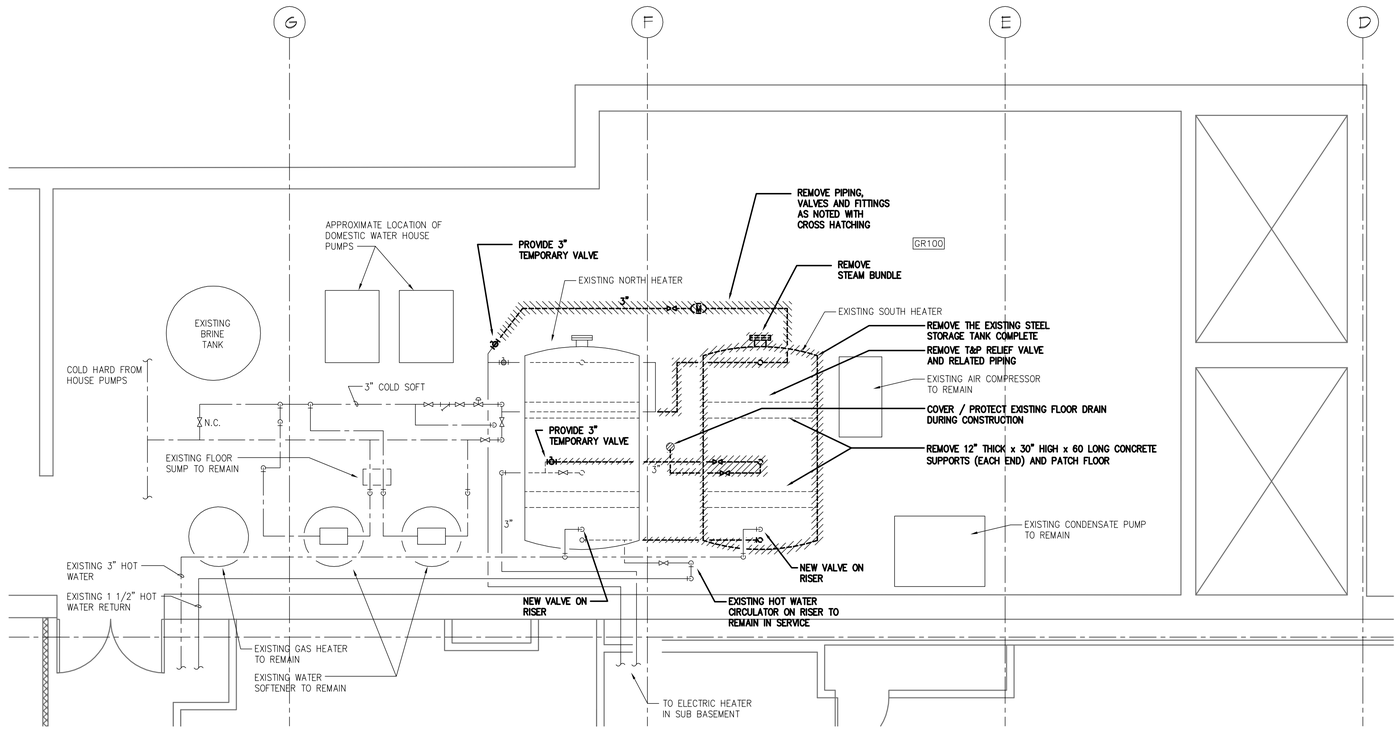
PLUMBING SYMBOLS

CS	COLD SOFT
	HOT WATER
	HOT WATER RETURN
	COLD WATER
	BALL VALVE / BUTTERFLY
	GATE VALVE
	CHECK VALVE
	CIRCUIT SETTER
	HOT WATER CIRCULATOR
	UNION
	PIPE UP
	PIPE DOWN
	CONNECTION TO EXISTING
	PIPE REMOVAL
NC	NORMALLY CLOSED
NO	NORMALLY OPEN



A P101 MECHANICAL ROOM FLOOR PLAN – EXISTING CONDITIONS AND NEW VALVES

SCALE: 1/4" = 1'-0"



B P101 MECHANICAL ROOM FLOOR PLAN – PHASE 1 DEMOLITION

SCALE: 1/4" = 1'-0"

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Notes:

GENERAL NOTES

1. VERIFY THE LOCATION AND SIZE OF EXISTING PIPING, DUCTWORK, ELECTRICAL SYSTEMS WHICH ARE RELEVANT TO THE INSTALLATION OF NEW EQUIPMENT AND PIPING SYSTEMS.

2. VISIT THE BUILDING AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS AFFECTING THE WORK.

3. IT IS THE INTENT OF THESE DRAWINGS THAT A COMPLETE WORKING SYSTEM PROPERLY TESTED, WILL BE OPERATIONAL UPON COMPLETION OF INSTALLATION

4. THE DRAWINGS ARE SCHEMATIC IN NATURE. ALL REQUIRED OFFSETS, FITTINGS, AND SUPPORTS SHALL BE INCLUDED IN THE BASE BID TO ACCOMMODATE ACTUAL FIELD CONDITIONS. FINAL LOCATIONS OF ALL WORK SHALL BE COORDINATED IN THE FIELD AND INSTALLED WHERE DIRECTED BY THE OWNERS REPRESENTATIVE.

Date	Issuance/Revisions	Symbol
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9/1/10	ISSUED FOR REVIEW	

DOMESTIC HOT WATER SYSTEM REPLACEMENT WITH HEAT RECOVERY

DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HIGHWAY AND TRANSPORTATION
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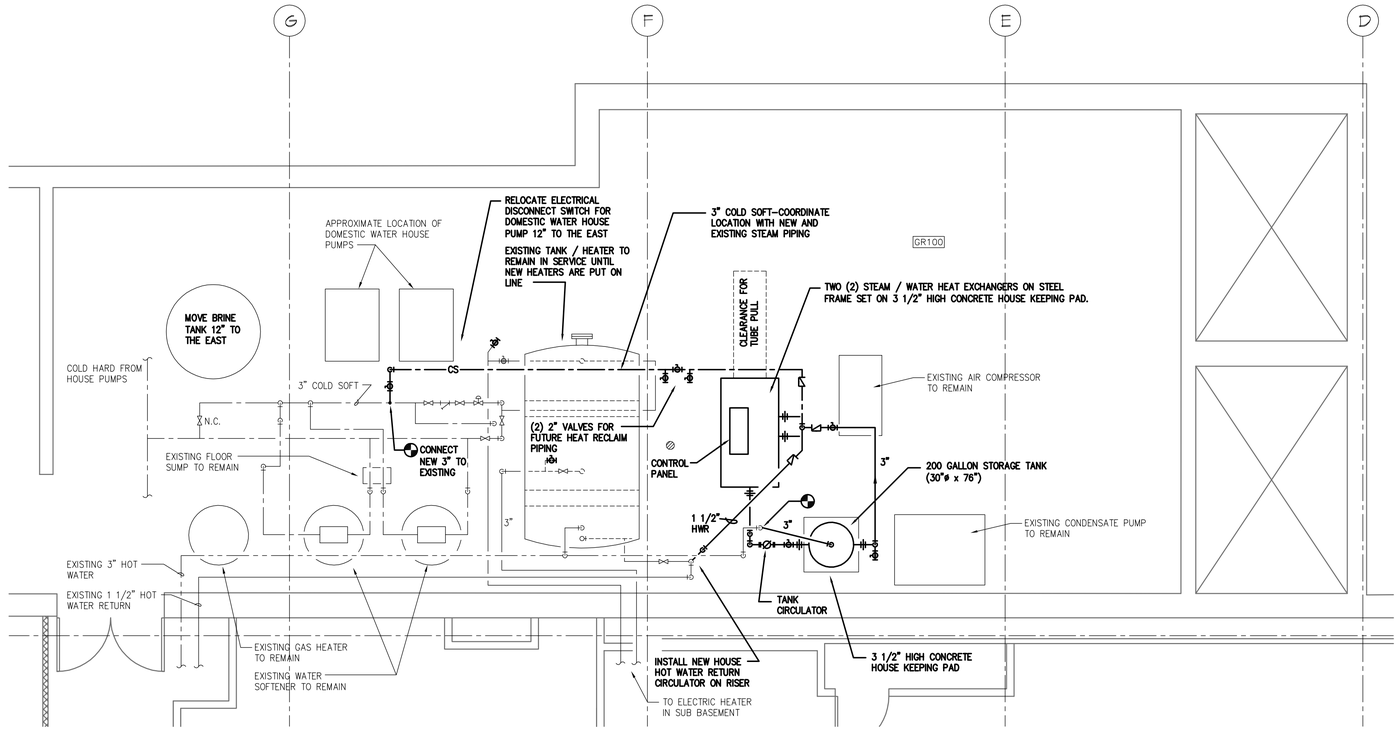
Drawing Title:

MECHANICAL ROOM FLOOR PLAN - EXISTING CONDITIONS AND PHASE I DEMOLITION

Eng. 370 Project Number: 10-0506

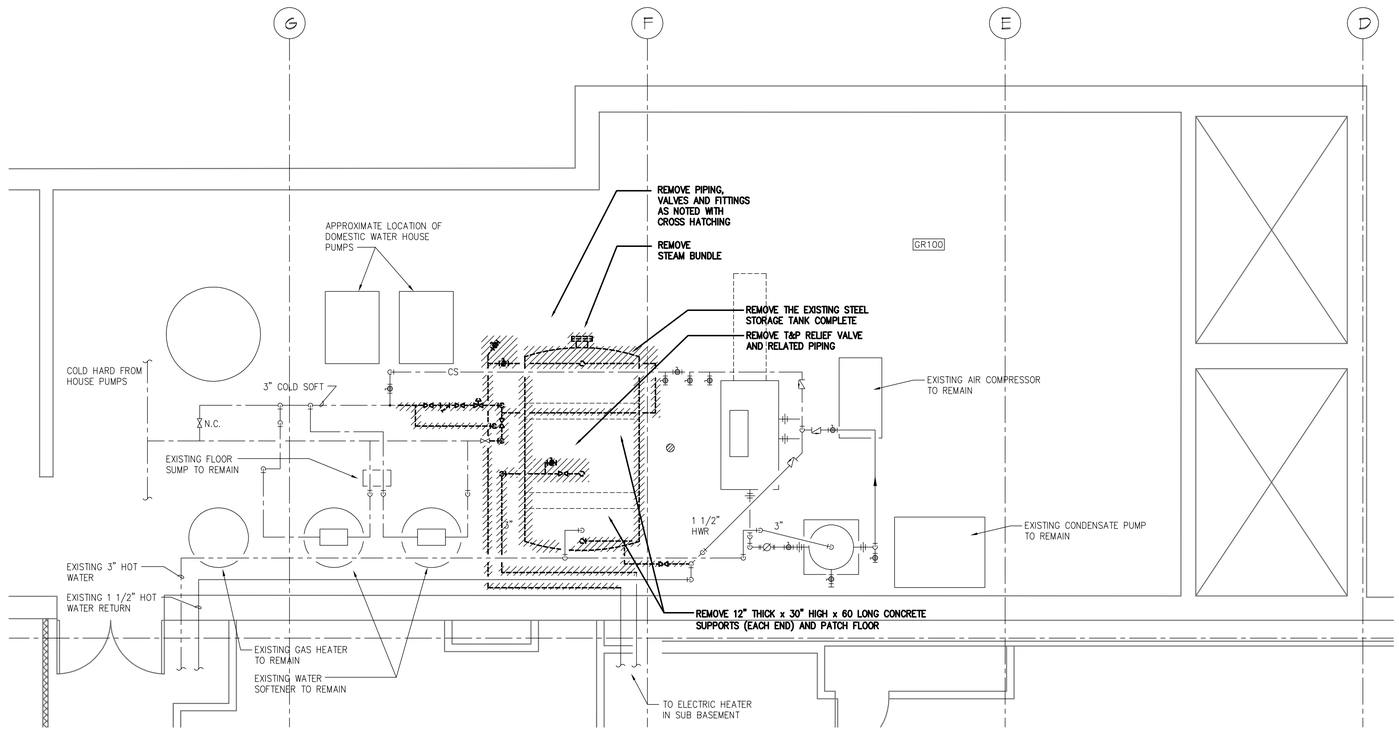
Drawn By: FBN

Drawing No. P101



A P102 MECHANICAL ROOM FLOOR PLAN – PHASE 2 NEW WORK

SCALE: 1/4" = 1'-0"



B P102 MECHANICAL ROOM FLOOR PLAN – PHASE 3 DEMOLITION

SCALE: 1/4" = 1'-0"

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DOMESTIC HOT WATER SYSTEM REPLACEMENT WITH HEAT RECOVERY

DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HIGHWAY AND TRANSPORTATION
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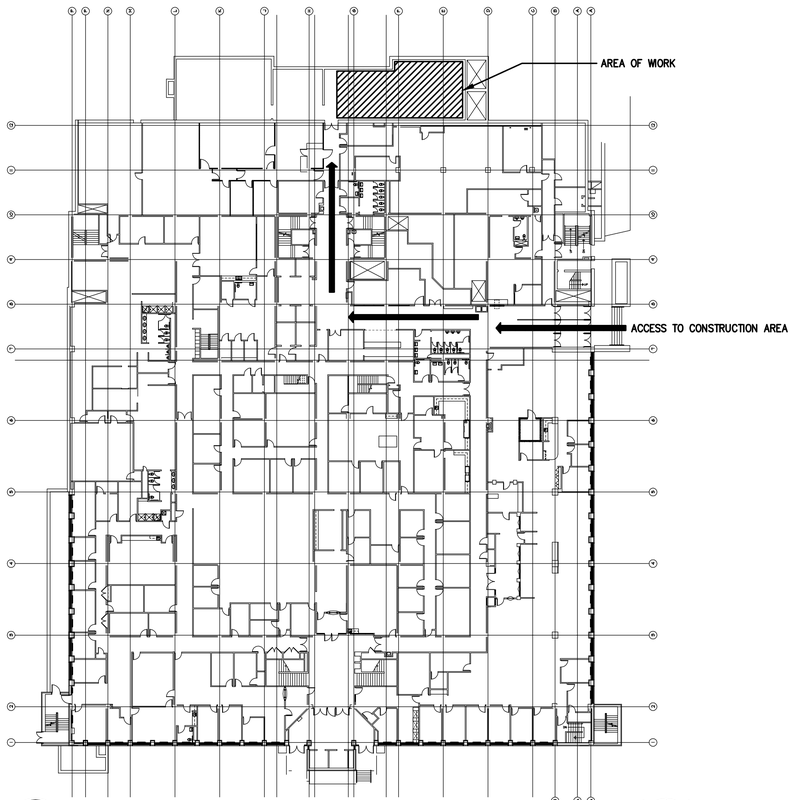
Drawing Title:

MECHANICAL ROOM FLOOR PLAN - PHASE 2 NEW WORK AND PHASE 3 DEMOLITION

Eng. 370 Project Number: 10-0506

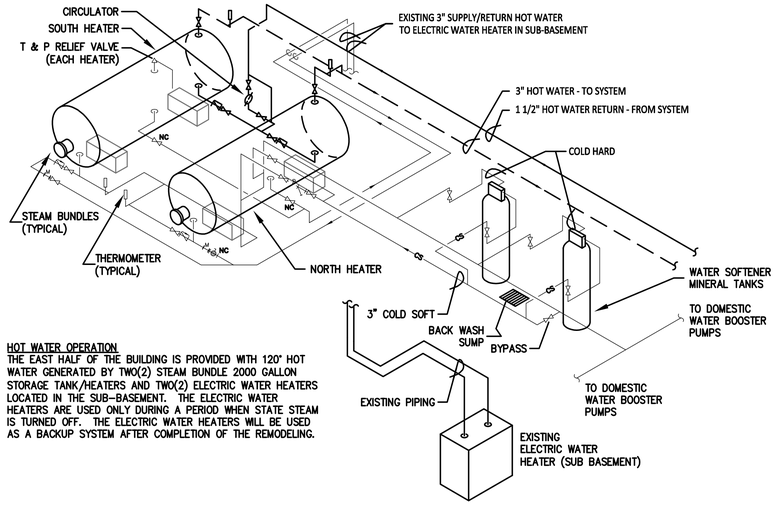
Drawn By: FBN

Drawing No. P102



C / P103 OVERALL FLOOR PLAN – ACCESS TO WORK AREA

NOT TO SCALE



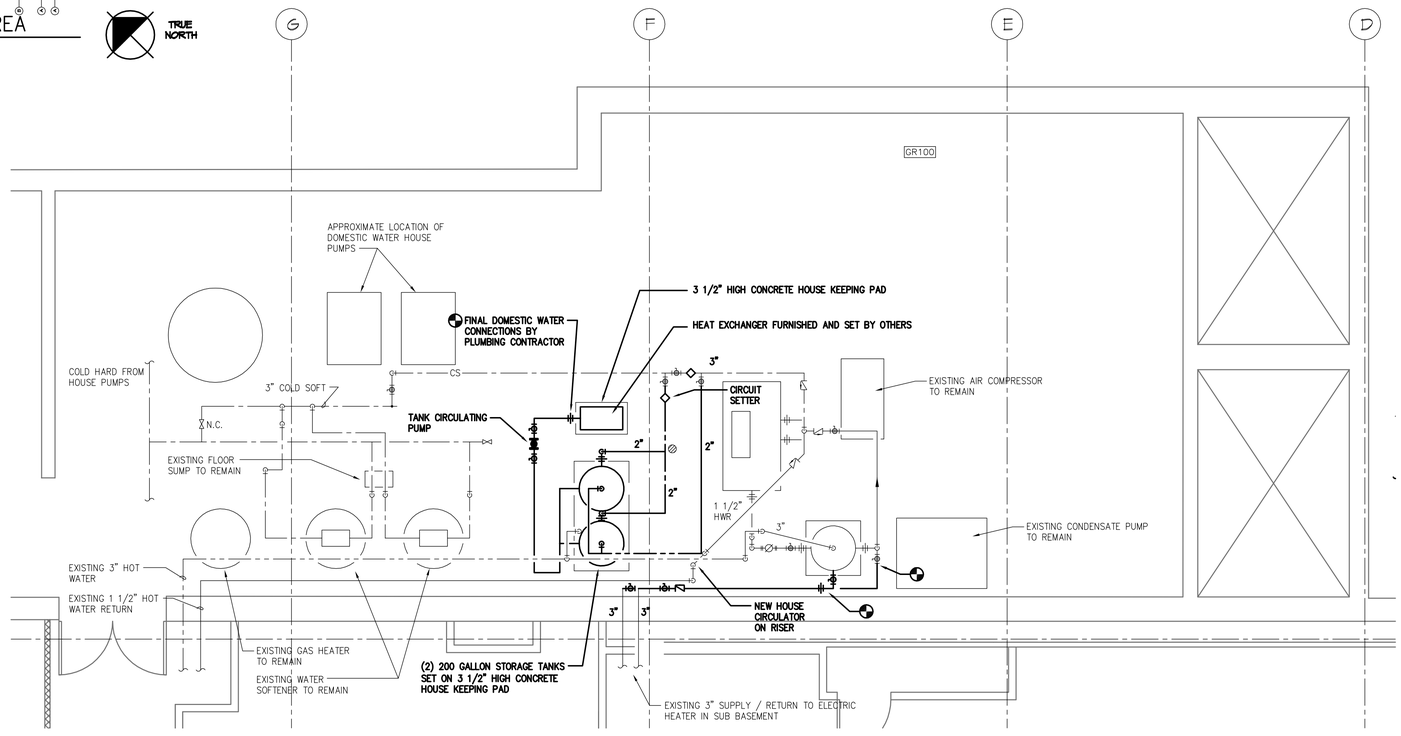
HOT WATER OPERATION

THE EAST HALF OF THE BUILDING IS PROVIDED WITH 120° HOT WATER GENERATED BY TWO(2) STEAM BUNDLE 2000 GALLON STORAGE TANK/HEATERS AND TWO(2) ELECTRIC WATER HEATERS LOCATED IN THE SUB-BASEMENT. THE ELECTRIC WATER HEATERS ARE USED ONLY DURING A PERIOD WHEN STATE STEAM IS TURNED OFF. THE ELECTRIC WATER HEATERS WILL BE USED AS A BACKUP SYSTEM AFTER COMPLETION OF THE REMODELING.

B / P103 WATER HEATER DIAGRAM – EXISTING CONDITIONS

NOT TO SCALE

TRUE NORTH



A / P103 MECHANICAL ROOM FLOOR PLAN – PHASE 4 NEW WORK

SCALE: 1/4" = 1'-0"

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DOMESTIC HOT WATER SYSTEM REPLACEMENT WITH HEAT RECOVERY

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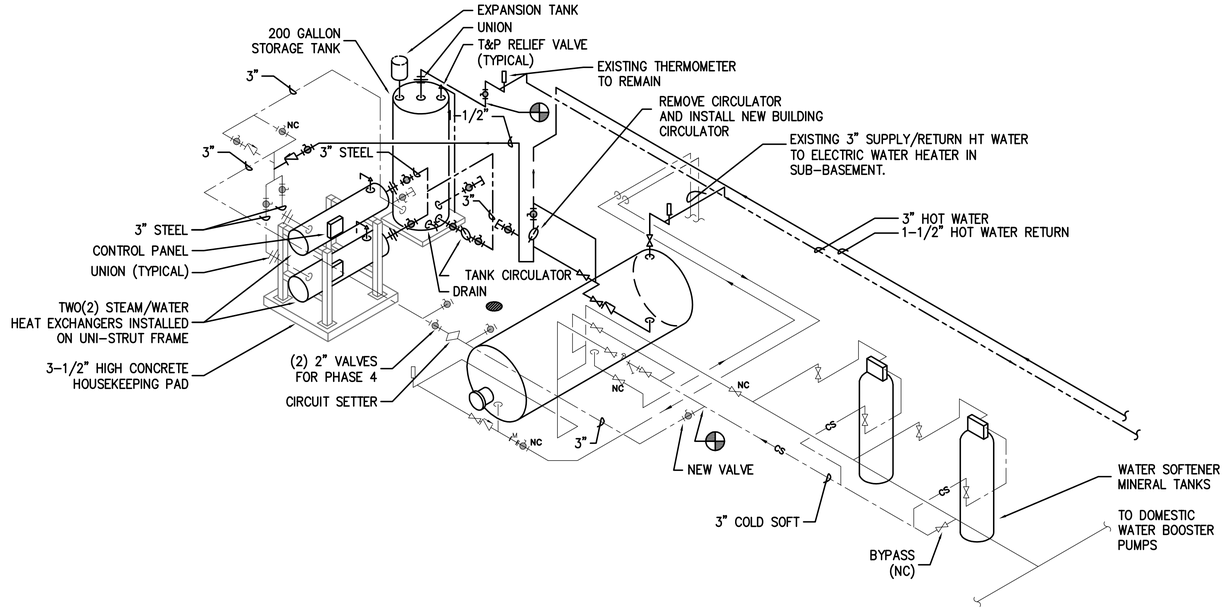
Drawing Title:

MECHANICAL ROOM FLOOR PLAN - PHASE 4 NEW WORK AND EXISTING COND. DIAGRAM

Eng. 370 Project Number: 10-0506

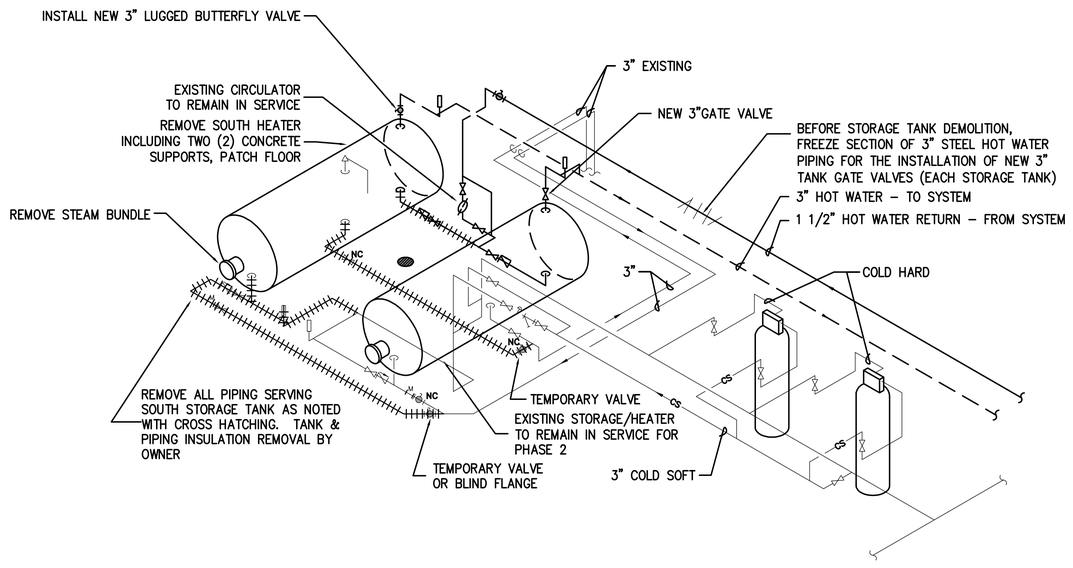
Drawn By: FBN

Drawing No. P103



B / P104 WATER HEATER DIAGRAM – PHASE 2

NOT TO SCALE



A / P104 WATER HEATER DIAGRAM – PHASE 1

NOT TO SCALE

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DOMESTIC HOT WATER SYSTEM REPLACEMENT WITH HEAT RECOVERY

DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HIGHWAY AND TRANSPORTATION
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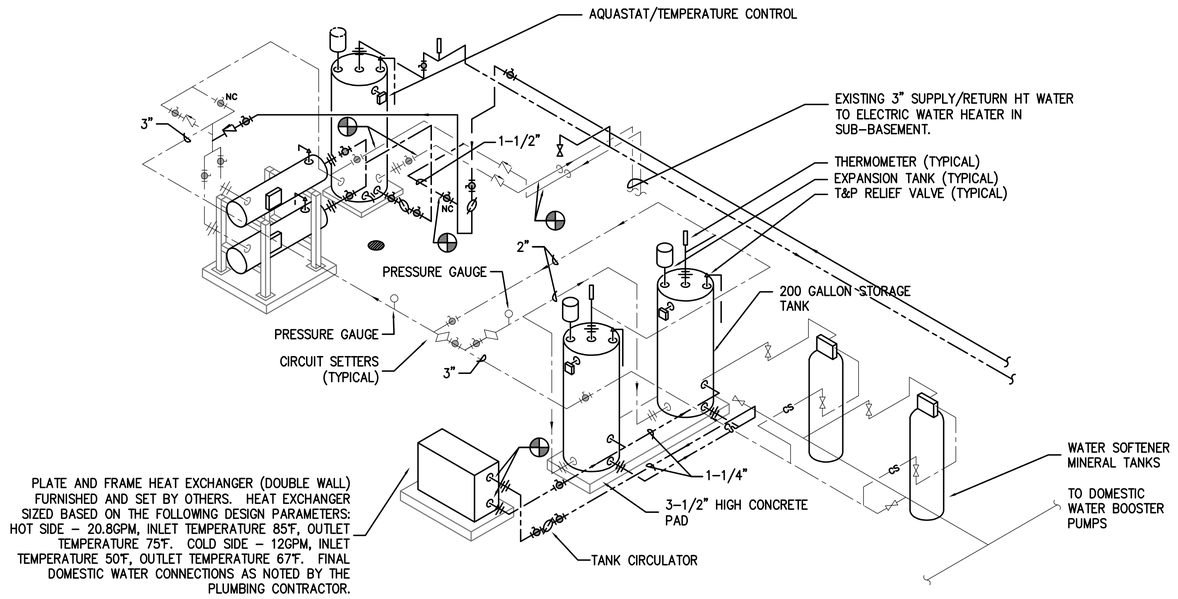
Drawing Title:

PLUMBING PIPNG DIAGRAMS

Eng. 370 Project Number: 10-0506

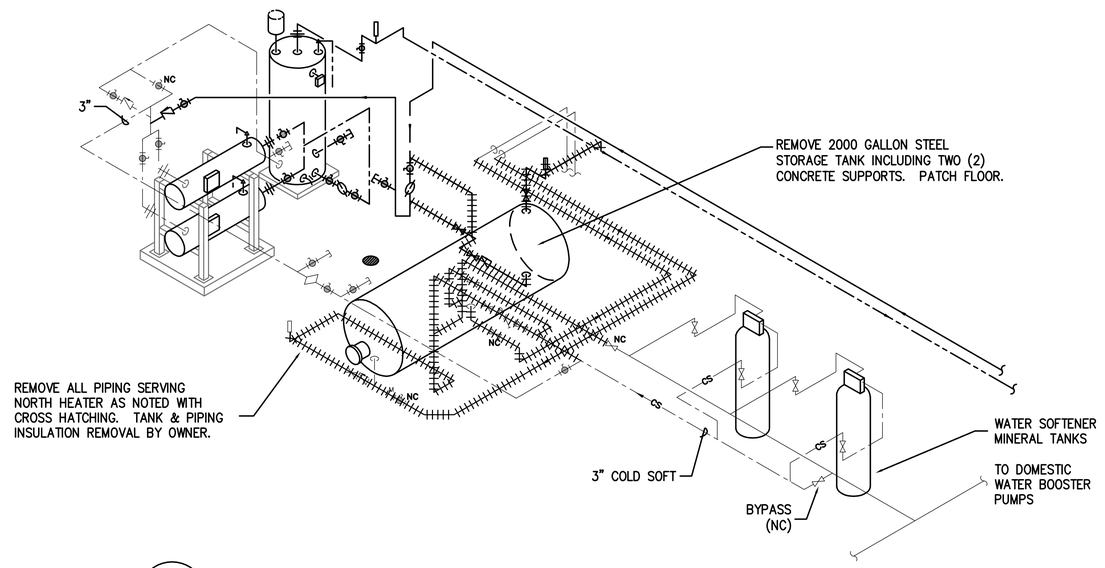
Drawn By: FBN

Drawing No. P104



B / P105 WATER HEATER DIAGRAM – PHASE 4

NOT TO SCALE



A / P105 WATER HEATER DIAGRAM – PHASE 3

NOT TO SCALE

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DOMESTIC HOT WATER SYSTEM REPLACEMENT WITH HEAT RECOVERY

DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HIGHWAY AND TRANSPORTATION
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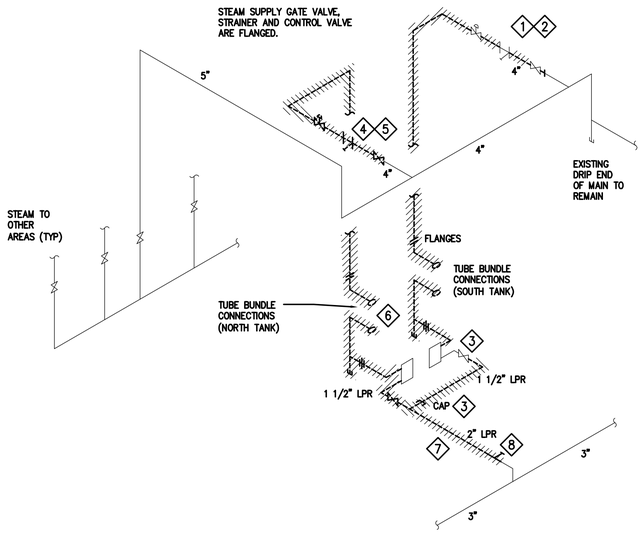
Drawing Title:

PLUMBING PIPNG DIAGRAMS

Eng. 370 Project Number: 10-0506

Drawn By: FBN

Drawing No. P105



B H101 STEAM PIPING DEMOLITION DIAGRAM (PHASE 1 & 3)

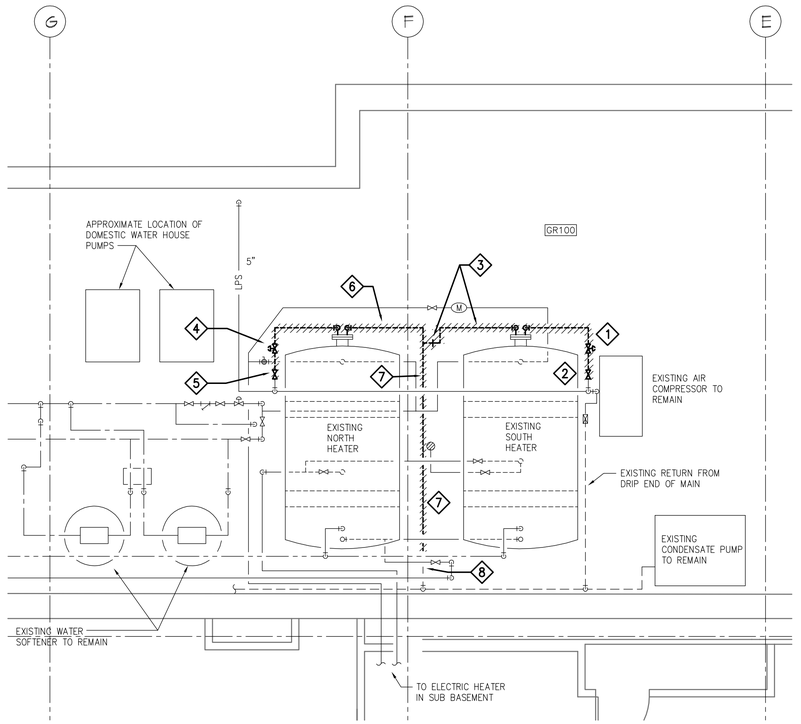
NOT TO SCALE

PHASE 1 DEMOLITION NOTES:

1. REMOVE 4" STEAM PIPING FROM MAIN TO CONNECTION TO STEAM TUBE BUNDLE IN HOT WATER STORAGE TANK, INCLUDING GATE VALVE, STRAINER AND CONTROL VALVE.
2. NEW GATE VALVE TO BE INSTALLED AT TIME EXISTING VALVE IS REMOVED. REFER TO NEW WORK PLANS AND DETAILS.
3. DISCONNECT CONDENSATE RETURN PIPING FROM TUBE BUNDLE AND REMOVE TRAP AND VALVES. CAP CONDENSATE PIPE AT CONNECTION TO CONDENSATE FROM NORTH TANK.

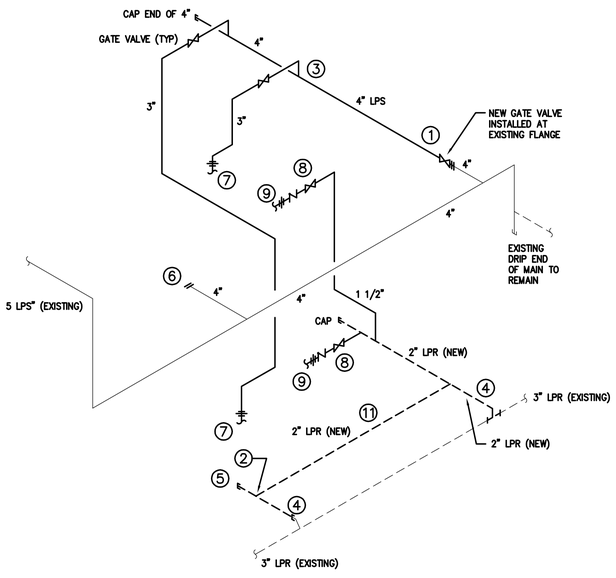
PHASE 3 DEMOLITION NOTES:

4. REMOVE 4" STEAM PIPING FROM MAIN TO CONNECTION TO STEAM TUBE BUNDLE IN HOT WATER STORAGE TANK, INCLUDING GATE VALVE, STRAINER AND CONTROL VALVE.
5. INSTALL BLIND FLANGE AT REMOVED VALVE.
6. DISCONNECT CONDENSATE RETURN PIPING FROM TUBE BUNDLE AND REMOVE TRAP AND VALVES.
7. REMOVE 2" CONDENSATE PIPING BACK TO LOCATION OF NEW CONNECTION TO EXISTING 2". CAP 2" AT NEW TEE. SEE NEW PIPING DETAIL.
8. REMOVE PORTION OF 2" PIPE TO INSTALL NEW 2" TEE.



A H101 PARTIAL MECH. ROOM FLOOR PLAN – HEATING DEMO (PHASE 1 & 3)

SCALE: 1/4" = 1'-0"



D H101 STEAM PIPING NEW WORK DIAGRAM (PHASE 2 & 4)

NOT TO SCALE

PHASE 2 NEW WORK NOTES:

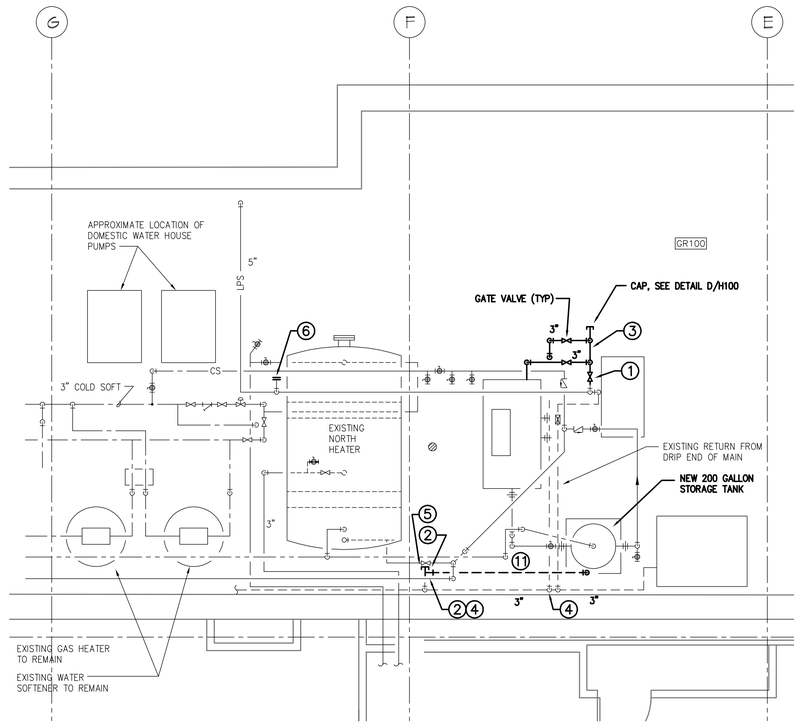
1. MAKE NEW CONNECTION TO EXISTING 4" FLANGE INSTALL 4" GATE VALVE
2. INSTALL 2" TEE IN EXISTING 2" CONDENSATE LINE (SEE NOTE 4 FOR OPTION)
3. NEW STEAM PIPING TO NEW HOT WATER HEATERS.
4. AT CONTRACTOR OPTION, MAKE NEW CONNECTION TO EXISTING 3" AT WALL IN LIEU OF OFFSETTING NORTH TO EXISTING 2". IF NEW CONNECTION IS MADE TO 3", CAP EXISTING 2" AFTER REMOVAL OF NORTH HEATER.

PHASE 4 NEW WORK NOTES:

5. CAP EXISTING 2" AFTER NORTH TANK STEAM PIPING IS REMOVED.
6. INSTALL BLIND FLANGE AFTER STEAM PIPING TO NORTH TANK IS REMOVED. (SEE PHASE 3 DEMO NOTE 5)

STEAM PIPING DIAGRAM NOTES

7. MAKE FLANGED CONNECTION TO WATER HEATER STEAM INLET. THE UNIT IS FACTORY PIPED WITH STEAM CONTROL VALVES AND INLET STRAINER. PROVIDE CONNECTION WITH REDUCERS, NIPPLES, FLANGES AS REQUIRED.
8. PROVIDE UNION, CHECK VALVE AND GATE VALVE ON RETURN.
9. MAKE CONNECTION TO WATER HEATER CONDENSATE OUTLET.
10. THE UNIT IS FACTORY PIPED WITH MAIN STEAM SUPPLY DRIP TRAP AND HEATER TRAP TO A SINGLE OUTLET CONNECTION. VERIFY SIZE AND PROVIDE NIPPLES, REDUCERS / INCREASERS AND UNION REQUIRED FOR CONNECTION.
11. RUN 2" CONDENSATE TO EXISTING AND CONNECT TO NEW TEE. ALSO SEE NOTE 2 & 4.



C H101 PARTIAL MECH. ROOM FLOOR PLAN – HEATING NEW WORK (PHASE 2 & 4)

SCALE: 1/4" = 1'-0"

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Project No. 10-0506

Notes:

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DOMESTIC HOT WATER SYSTEM REPLACEMENT WITH HEAT RECOVERY

DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HIGHWAY AND TRANSPORTATION
CITY COUNTY BUILDING
210 MARTIN LUTHER KING JR. BLVD.
MADISON, WI 53703

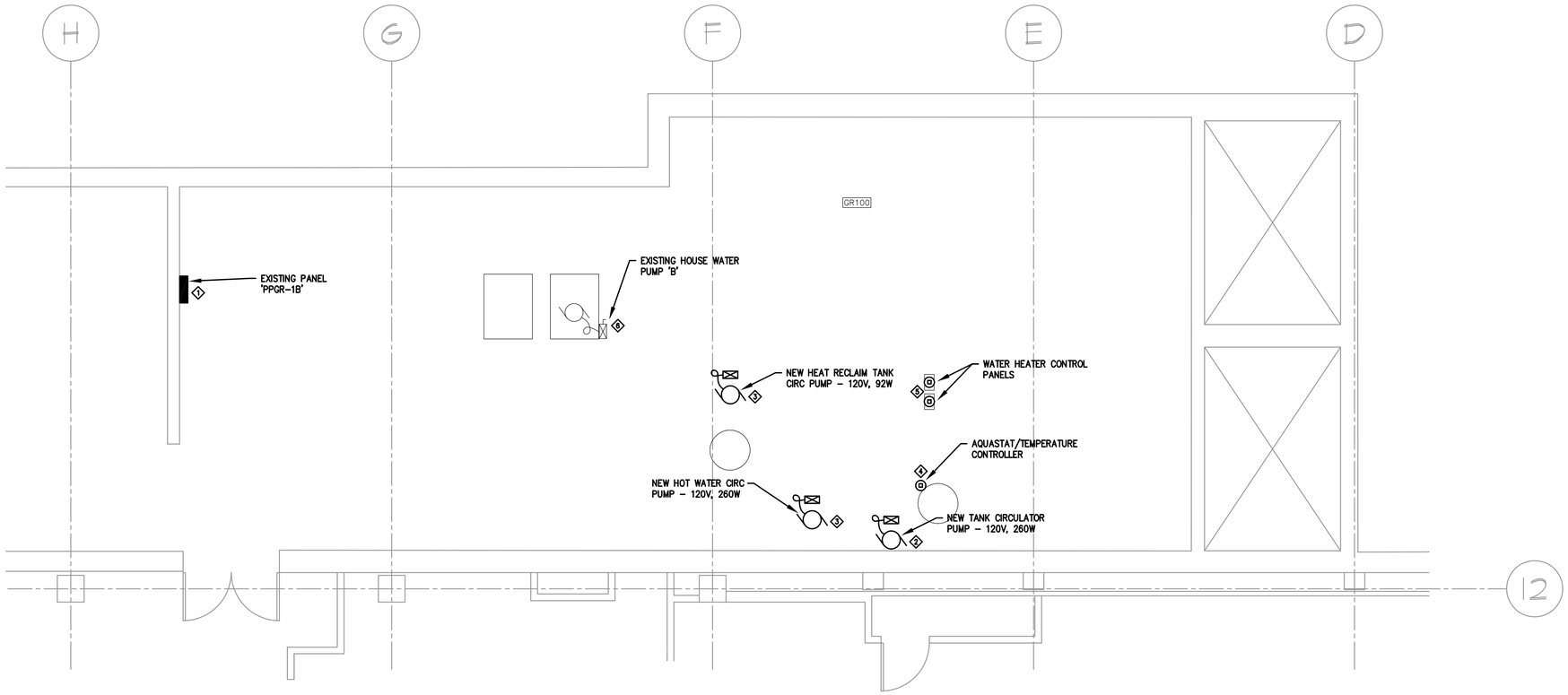
Drawing Title:

MECHANICAL ROOM FLOOR PLANS AND DETAILS

Eng. 370 Project Number: 10-0506

Drawn By: FBN

Drawing No. M101



COORDINATE ALL ELECTRICAL WORK CLOSELY WITH OWNER AND ALL OTHER TRADES.

A / E101 PARTIAL GROUND FLOOR PLAN – ELECTRICAL

SCALE: 1/4" = 1'-0"

ELECTRICAL SYMBOLS	
SYMBOL	DESCRIPTION
▬	PANELBOARD
◡	MOTOR CONNECTION
⊠	MANUAL MOTOR STARTER
▭	DISCONNECT SWITCH
⊠	COMBINATION STARTER DISCONNECT SWITCH
ⓓ	DIRECT ELECTRICAL CONNECTION

ELECTRICAL PLAN NOTES:

1. EXISTING SQUARE D, TYPE NQOD, 120/208V, 3ø, 4W, 100A PANEL. UTILIZE EXISTING SPARE 20/1 BREAKERS TO FEED ALL NEW EQUIPMENT. REVISE EXISTING PANELBOAD CIRCUIT DIRECTORY.
2. DISCONNECT EXISTING CIRC PUMP AND REMOVE ASSOCIATED WIRE & CONDUIT BACK TO NEAREST JUNCTION BOX. PROVIDE NEW MANUAL STARTER AT PUMP, AND FEED NEW PUMP WITH 2#12, 1#12G, 3/4"C, FROM CKT #18.
3. PROVIDE NEW MANUAL STARTER AT PUMP, AND FEED NEW PUMP WITH 2#12, 1#12G, 3/4" C, FROM CKT #18.
4. FEED NEW AQUASTAT/TEMPERATURE CONTROLLER WITH 2#12, 1#12G, 3/4" C FROM CKT #20.
5. FEED NEW WATER HEATER CONTROL PANELS WITH 2#12, 1#12G, 3/4" C FROM CKT #20.
6. DISCONNECT EXISTING HOUSE PUMP 'B' COMBINATION STARTER/DISCONNECT SWITCH, UN-BOLT EXISTING MOUNTING STRUCTURE AT FLOOR, AND TEMPORARILY RELOCATE TO AVOID DAMAGE DURING EXISTING MECHANICAL EQUIPMENT REMOVAL AND NEW EQUIPMENT DELIVERY. RE-INSTALL AND RE-CONNECT COMBINATION STARTER/DISCONNECT SWITH IN ORIGINAL LOCATION AFTER NEW EQUIPMENT DELIVERY.

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Project No. 10-0506

Notes:

Date	Issuance/Revisions	Symbol
11/2/10	ISSUED FOR BIDDING	
9/1/10	ISSUED FOR REVIEW	

DOMESTIC HOT WATER SYSTEM REPLACEMENT WITH HEAT RECOVERY

DANE COUNTY DEPARTMENT OF PUBLIC WORKS, HIGHWAY AND TRANSPORTATION
CITY COUNTY BUILDING
210 MARTIN LUTHER KING JR. BLVD.
MADISON, WI 53703

Drawing Title:

PARTIAL GROUND FLOOR PLAN - ELECTRICAL

Eng. 370 Project Number: 10-0506

Drawn By: RDH

Drawing No. E101