

PROJECT MANUAL FOR:

# Cobleigh Hall – Cold Chambers Cooling Tower Replacement

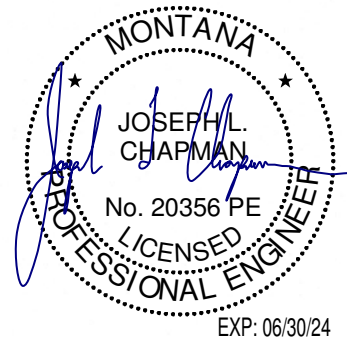
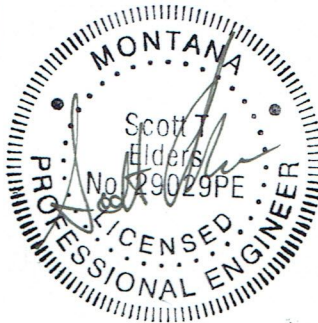
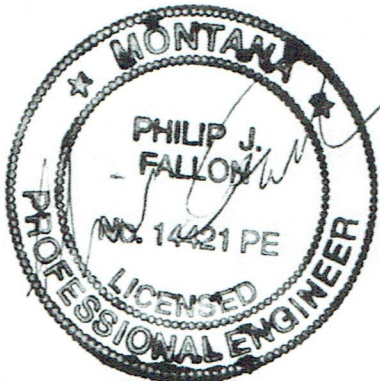
MONTANA STATE UNIVERSITY  
BOZEMAN, MONTANA

**January 4, 2024**

**PPA No. 18-2194**



228 W. MAIN, SUITE C  
MISSOULA, MT 59802  
406-214-3500  
www.mckinstry.com



**MONTANA  
STATE UNIVERSITY**

UNIVERSITY FACILITIES MANAGEMENT  
BOZEMAN, MONTANA  
PHONE: (406) 994-5413 FAX: (406) 994-5665

# TABLE OF CONTENTS

## BIDDING REQUIREMENTS

Permit Notice	
Invitation To Bid	
Instructions to Bidders	
Bid Proposal, Form 098 .....	

## CONTRACT DOCUMENTS

### Included in this Project Manual:

State of Montana General Conditions	MSU Supplemental Conditions
Cost Estimate to Re-key Buildings	Prevailing Wage Information

The following documents to be used for construction are not included in the printed project manual. These MSU Forms can be downloaded from our website:

<http://www.montana.edu/pdc/docs/index.html> – or will be provided upon request.

Substitution Request, Form 99	Certificate of Substantial Completion, Form 107
Schedule of Values for Payment, Form 100	Construction Change Directive, Form 109
Periodic Estimate for Partial Payment, Form 101	Request for Information, Form 111
Acknowledgement of Subcontractors, Form 102	Performance Bond, Form 112
Consent of Surety to Final Payment, Form 103	Labor and Material Payment Bond, Form 113
Contract Change Order, Form 104	Certificate of Final Acceptance, Form 118
Contractor’s Affidavit, Form 106	Buy Safe Montana Form

**For most current Montana Prevailing Wage Rates applicable to this project download from this site: <http://erd.dli.mt.gov/labor-standards/state-prevailing-wage-rates>**

## TECHNICAL SPECIFICATIONS

### Division 1 - General Requirements

Summary .....	011000
Price and Payment Procedures .....	012000
Substitution Procedures.....	012500
Submittals.....	013000
Project Coordination .....	013100
Quality Requirements .....	014000
Temporary Facilities .....	015000
Product Requirements .....	016000
Executions .....	017300
Warranties Bonds.....	017400
Waste Management.....	017419
Project Closeout .....	017700
Operations & Maintenance Manuals .....	017823
Project Record Documents .....	017839
Demonstrations & Training .....	017900
Selective Demolition .....	024119

### Division 23 - Mechanical

Basic Materials and Methods for HVAC .....	230000
Pipe, Valves, and Fittings for HVAC .....	230500
Testing, Adjusting and Balancing for HVAC .....	230593
HVAC Insulation .....	230719
Direct-Digital Control System for HVAC .....	230923
Central Cooling Equipment.....	236000

Division 26 –Electrical

Electrical General Requirements .....	260500
Medium, Low & Control Voltage Cables.....	260513
Grounding & Bonding for Electrical.....	260526
Electrical Materials and Methods .....	260533
Electrical Acceptance Tests.....	260800
Motor Controls.....	262900

CONSTRUCTION DRAWINGS

M-001	Mechanical Legend & Abbreviations
M-002	Mechanical Controls
M-060	Mechanical Schedules
M-061	Mechanical Details
MP-101	Mechanical Roof Plans
M-400	Enlarged Penthouse Plan
MD-400	Enlarged Penthouse Demolition Plan
ED1.1	Roof Plan – Power Demo
E1.1	Roof Plan – Power Remodel
S1.00	Mech. Platform Framing Plan, Notes and Details



## UNIVERSITY FACILITIES MANAGEMENT

Sixth Avenue and Grant Street • P.O. Box 172760 • Bozeman, Montana  
59717-2760 Phone: (406) 994-5413 • Fax: (406) 994-5665

### PERMIT NOTICE

The drawings and specifications for this project have been submitted to the city of Bozeman for review. The contractor will pay all permit fees. The owner shall pay for plan review fee and the impact fee required for this project. The building permit must be appropriately displayed at the project site before construction may begin. The contractor shall contact the city of Bozeman for further clarification at the following:

CITY OF BOZEMAN  
BUILDING INSPECTION DIVISION  
DEPARTMENT OF PUBLIC  
WORKS 20 EAST OLIVE STREET,  
SUITE 208 PO BOX 640  
BOZEMAN, MONTANA  
59771-0640 (406) 582-2300

BUILDING PERMIT

## INVITATION TO BID

Sealed bids will be received until **2:00 PM** on **Tuesday, February 27<sup>th</sup>, 2024**, and will be publicly opened and read aloud in the offices of **MSU University Facilities Management, Plew Building, 6<sup>th</sup> & Grant, Bozeman, Montana**, for: **Cobleigh Hall Cold Chambers Cooling Tower Replacement, PPA No. 18-2194**.

Bids shall be submitted on the form provided within the Contract Documents. Contract documents may be obtained at the offices of:

**Montana State University**  
**UNIVERSITY FACILITIES MANAGEMENT**  
**Plew Building, 6<sup>th</sup> & Grant**  
**PO Box 172760**  
**Bozeman, Montana 59717-2760**

**On the web at:**  
<http://www.montana.edu/pdc/bids.html>

***A PRE-BID WALK-THROUGH IS SCHEDULED FOR Tuesday, February 13<sup>th</sup>, 2024, AT 10:30 AM PARTICIPANTS SHOULD MEET AT: Plew Building, 6<sup>th</sup> & Grant, Bozeman, Montana. ATTENDANCE IS STRONGLY RECOMMENDED. Bidders should thoroughly review the contract documents before the pre-bid conference.***

Bids must be accompanied by a bid security meeting the requirements of the State of Montana in the amount of 10% of the total bid, if total bid exceeds \$150,000. After award, the successful bidder must furnish an approved Performance Security and a Labor & Material Payment Security each in the amount of 100% of the contract for contracts equal to or greater than \$150,000.

No bidder may withdraw his bid for at least thirty (30) calendar days after the scheduled time for receipt of bids except as noted in the Instructions to Bidders.

The Owner reserves the right to reject any or all bids and to waive any and all irregularities or informalities and the right to determine what constitutes any and all irregularities or informalities.

### Time of Completion

Bidder agrees to commence work immediately upon receipt of the Notice to Proceed and to substantially complete the project **by November 15, 2024**.

*The State of Montana makes reasonable accommodations for any known disability that may interfere with an applicant's ability to compete in the bidding and/or selection process. In order for the state to make such accommodations, applicants must make known any needed accommodation to the individual project managers or agency contacts listed in the contract documents.*

State of Montana - Montana State University

## INSTRUCTIONS TO BIDDERS

1. Table of Contents

**Provided in the Printed Project Manual:**

- Invitation to Bid
- Instruction to Bidders
- Bid Proposal, Form 098
- Sample Standard Form of Contract
- State of Montana General Conditions
- MSU Supplementary Conditions
- Specifications
- Drawings
- Lost Key Notification
- Prevailing Wage Rates

- Periodic Estimate for Partial Payment, Form 101
- Acknowledgement of Subcontractors, Form 102
- Consent of Surety to Final Payment, Form 103
- Contract Change Order, Form 104
- Contractor's Affidavit, Form 106
- Certificate of Substantial Completion, Form 107
- Construction Change Directive, Form 109
- Request for Information, Form 111
- Performance Bond, Form 112
- Labor and Material Payment Bond, Form 113
- Certificate of Final Acceptance, Form 118
- Buy-Safe Montana Form

**These additional forms can be found on our website or will be provided upon request:**

<http://www.montana.edu/pdc/docs/index.html>

- Substitution Request, Form 99
- Schedule of Values, Form 100

**For most current Montana Prevailing Wage Rates applicable to this project download from this site: <http://erd.dli.mt.gov/labor-standards/state-prevailing-wage-rates>**

2. Viewing of Contract Documents

2.1. The Contract Documents may be viewed at the following locations:

Builders Exchange of Billings  
2050 Broadwater STE A  
Billings MT 59102  
406/652-1311  
[bbx@billingsplanroom.com](mailto:bbx@billingsplanroom.com)

NW MT - Flathead Builders  
Exchange  
2303 Hwy 2 E  
Kalispell, MT 59901  
406/755-5888  
[planex@kalcopy.com](mailto:planex@kalcopy.com)

Helena Plans Exchange  
1530 Cedar Street Suite C  
Helena MT 59601  
406/457-2679  
[helenaplanex@helenacopycenter.com](mailto:helenaplanex@helenacopycenter.com)

Bozeman Builders Exchange  
1105 Reeves RD W STE 800  
Bozeman MT 59718  
406/586-7653  
[exchange@bozemanplanroom.com](mailto:exchange@bozemanplanroom.com)

Great Falls Builders Exchange  
202 2ND Avenue S  
Great Falls MT 59401  
406/453-2513  
[gfbe@greatfallsplans.com](mailto:gfbe@greatfallsplans.com)

Missoula Plans Exchange  
201 N Russell ST  
Missoula MT 59801  
406/549-5002  
[mpe@vemcoinc.com](mailto:mpe@vemcoinc.com)

Butte Builders Exchange  
4801 Hope Road  
Butte MT 59701  
406/782-5433  
[butteplans@gmail.com](mailto:butteplans@gmail.com)

3. Borrowing of Documents: Up to two hard copy sets may be obtained for General Contractors. Additionally, Contract Documents will be available electronically. If shipping of hard copies is required, it will be at the contractor's expense.

3.1. Contract Documents may be obtained at the office of:

**MONTANA STATE UNIVERSITY  
UNIVERSITY FACILITIES MANAGEMENT  
PLEW BUILDING 1st FLOOR  
6TH AND GRANT  
BOZEMAN, MONTANA 59717-2760  
406/994-5413**

3.2. All borrowed Contract Documents shall be returned to University Facilities Management within ten (10) calendar days after the bid opening for the deposit refund (if deposit was required). However, if the Contract Documents are not in a condition where they can be reused by the

Owner to construct the project, the Owner may at its sole discretion may retain the deposit or levy costs to contractor in order to reproduce a replacement set.

4. Visits to Site

4.1. Prospective bidders are requested to contact the following for inspection of the site:

**Todd Cook, Facilities Engineer  
Montana State University  
University Facilities Management  
6<sup>th</sup> and Grant, PO Box 172760  
Bozeman, Montana 59717-2760  
Ph: 406/994-5480; Fax: 406/994-5665**

4.2. Failure to visit site will not relieve the Contractor of the conditions of the contract.

5. Requests for Substitution

5.1 Any requests for product substitutions must be submitted on the "Substitution Request" Form 099, to the Architect/Engineer at least ten (10) days prior to the date of the bid opening for consideration by the Architect/Engineer. Any request for substitution made after this time restriction, including those made after award during project construction may be rejected without consideration by either the Architect/Engineer or the Owner.

6. Bids/Proposals

6.1. The bidder shall submit his bid on the Bid Proposal Form furnished with the Contract Documents.

6.2. DO NOT send the Contract Documents with the Proposal. The Contract Documents shall be returned as noted in Article 3.2 of the Instructions to Bidders.

6.3. If the project is funded by any portion of federal funds, the following may apply: on Federally-funded projects, a "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion" form must be submitted with the bid proposal. If the debarment form is not included within the Construction Documents, federal funds (if included) do not require the form or are not included in the project and the debarment form is not required.

6.4. Proposals shall be in a sealed envelope and addressed to:

**STATE OF MONTANA, MONTANA STATE UNIVERSITY  
UNIVERSITY FACILITIES MANAGEMENT  
PLEW BUILDING 1ST FLOOR  
6TH AND GRANT  
PO BOX 172760, BOZEMAN, MONTANA 59717-2760**

6.5. The envelope shall state that it contains a "BID PROPOSAL" and indicate the following information:

Name of Project: **Cobleigh Hall Cold Chambers Cooling Tower Replacement**  
Location: **Montana State University Bozeman Campus**  
MSU PPA Project Number: **18-2194**  
Name of Bidder: \_\_\_\_\_  
Acknowledge Addendum Number: \_\_, \_\_, \_\_, \_\_

6.6. It is the bidder's responsibility to deliver or ensure delivery of the bid proposal to Montana State University, University Facilities Management. Proposals received after the scheduled closing time for bids by either the bidder, a delivery service (e.g. Federal Express, U.S. Postal Service, United Parcel Service, etc.), or the state's own mail delivery system, will be rejected. Proposals entitled for consideration must be time-stamped in the Owner's office prior to the closing time for receipt of bids. The official time clock for receipt of bids and fax modifications is the Owner's time and date stamp clock located in the reception area of the Owner's office. No other clocks, calendars or timepieces are recognized. All bidders are responsible to ensure all bids and fax modifications are received in the Owner's office prior to the scheduled closing time.



- 6.7. If requested on the Bid Proposal, any person making a bid to perform the Work shall, as a requirement of a responsible bid, set forth the name of each subcontractor specified in the "List of Subcontractors" which is part of the bid proposal. The bidder shall list only one subcontractor for each such portion or work listed. The bidder whose bid is accepted shall not:
  - 6.7.1. Substitute any other subcontractor in place of the subcontractor listed in the original bid, except by specific consent of the Owner. The Owner, at its sole discretion, may grant substitution with consent of the originally listed subcontractor, or in consideration of other factor(s) involved if deemed relevant to the successful performance of the Contract.
  - 6.7.2. Permit any such subcontract to be voluntarily assigned, transferred or allow it to be performed by any party other than the subcontractor listed in the original bid without the consent of the Owner.
- 6.8. Bid Proposals entitled to consideration shall be made in accordance with the following instructions:
  - 6.8.1. Made upon form provided;
  - 6.8.2. All blank spaces properly filled;
  - 6.8.3. All numbers stated in both writing and in figures;
  - 6.8.4. Shall contain no additions, conditional or alternate bids, erasures or other irregularities;
  - 6.8.5. Shall acknowledge receipt of all addenda issued.
- 6.9. Bid Proposals entitled to consideration shall be signed by the proper representative of the firm submitting the proposal as follows:
  - 6.9.1. The principal of a single owner firm;
  - 6.9.2. A principal of a partnership firm;
  - 6.9.3. An officer of an incorporated firm, or an agent whose signature is accompanied by a certified copy of the resolution of the Board of Directors authorizing that agent to sign; or,
  - 6.9.4. Other persons signing for a single-owner firm or a partnership shall attach a power-of-attorney evidencing his authority to sign for that firm.
- 6.10. Unit Prices: When a Bid Proposal Form contains unit prices, any errors discovered in the extension of those unit prices will be corrected by the Owner using the unit price figures. The adjusted extended amount will then be used to determine the correct total bid. Only after the amounts have been checked and adjusted, if necessary, will the valid low bid be determined.
- 6.11. Estimated Quantities: All estimated quantities stipulated in the Bid Proposal and other Contract Documents are approximate and are to be used only as a basis for estimating the probable cost of the work and for the purpose of comparing proposals submitted for the work. It is understood and agreed that the actual amounts of work done, and materials furnished under unit price items may vary from such estimated quantities. The actual quantities will depend on the conditions encountered at the time the work is performed.
- 6.12. Any bidder may modify his bid by fax communication only.
  - 6.12.1 It is the bidder's responsibility to ensure that the entire modification is received at the bid opening location prior to the scheduled closing time for receipt of bids. The modification shall not reveal the bid price but shall only provide the ADDITION or SUBTRACTION from the original proposal.
  - 6.12.2 The Owner is not responsible for the performance of the facsimile/printer machine, maintaining adequate paper levels, toner levels, the telephone connection, quality of the facsimile, or any other factors affecting receipt of the fax. Unreadable or difficult-to-read facsimiles may be rejected at the sole discretion of the Owner.
  - 6.12.3 Changes in the listed subcontractors, if any, shall also be provided.
  - 6.12.4 Bid modifications must be verified by hard copy provided to the Owner within two (2) business days after the bid opening.
  - 6.12.5 Bid modifications shall be directed to fax phone (406) 994-5665.
  - 6.12.6 All facsimiles shall be date and time stamped on the same time-stamp clock in the Owner's office that is used for receipt of bids in order to be considered valid. The Owner may also use the date and time on the automatically-generated email notification of



facsimile receipt as generated by the State's system. Any date and time indicated at the top of the facsimile on either the bidder's or the Owner's facsimile/printer machine will not be used in determining time of arrival of the modification.

- 6.13. The Owner reserves the sole right to reject any or all bids and to waive any irregularities or informalities. The Owner also reserves the sole right to determine what constitutes irregularities or informalities and/or what is material and/or immaterial to the bids received.

## 7. Bid Security

- 7.1. IF THE PROJECT COST IS LESS THAN \$25,000, AT ITS SOLE DISCRETION THE STATE OF MONTANA MAY OR MAY NOT REQUIRE BID SECURITY (18-2-302 MCA).
- 7.2. All proposals exceeding \$150,000 shall be accompanied by a bid security in the amount of 10% of the bid price, as evidence of good faith (18-2-302 MCA). **(MSU does not waive bid security.)**
- 7.3. Bid security shall be in the form of lawful moneys of the United States, cashier's check, certified check, bank money order or bank draft, bid bond or bonds payable to the State of Montana (18-2-302 MCA).
- 7.4. If the bidder, to whom a contract is awarded, fails to enter into and execute the proposed contract within fifteen (15) calendar days of award, the bidder shall forfeit the bid security (18-1-204 MCA).
- 7.5. The bid security of unsuccessful bidders will be returned when the contract has been awarded to the successful bidder or when all bids have been rejected (18-1-205 MCA).
- 7.6. Execution of and entering into a contract includes providing all necessary insurance certificates, bonds, signed contract and current copy of the construction contractor registration certificate.
- 7.7. **NOTE: PER STATE POLICY, IF CASH, CHECK, MONEY ORDER, OR BANK DRAFT ARE PROVIDED AS BID SECURITY, IT WILL BE DEPOSITED IN THE TREASURY. UNSUCCESSFUL BIDDERS WILL HAVE THEIR SECURITY RETURNED UPON CONTRACT AWARD. THE SUCCESSFUL BIDDER'S SECURITY MAY BE RETURNED UPON ISSUANCE OF NOTICE TO PROCEED.**

## 8. Withdrawal of Bids

- 8.1. Any bidder may withdraw his bid proposal at any time prior to the scheduled closing time for the receipt of bids.
- 8.2. Once the closing time for the receipt of bids is reached, a bid may not be withdrawn for a period of thirty (30) calendar days.

## 9. Interpretation of Contract Documents

- 9.1. Bidders shall promptly notify the Architect/Engineer of any ambiguity, inconsistency, or error which they may discover upon examination of the Contract Documents or of the site and local conditions.
- 9.2. Bidders requiring clarification or interpretation of the Contract Documents shall request, in writing, clarification from the Architect/Engineer at least ten (10) calendar days prior to the date set for receipt of bids.
- 9.3. Any interpretations, corrections, or change in the Contract Documents prior to the bid opening will be made by written addendum issued by the Architect/Engineer. The Architect/Engineer will endeavor to notify all plan holders of any addenda issued but it shall be the responsibility of the individual bidders to insure they have received all addenda prior to the submission of their bid.
- 9.4. All written addenda issued by the Architect/Engineer will become part of the Contract Documents and all bidders shall be bound by such addenda whether or not received and/or acknowledged by the bidder. No oral or telephone modifications of the Contract Documents will be considered or allowed.

## 10. Award of Bids

- 10.1. All bids received by the stated hour will be opened and publicly read aloud.
- 10.2. The Owner reserves the right to reject any and all bids and to waive any informality or irregularity in any bid received. Owner reserves the right to determine what constitutes material and/or immaterial informalities and/or irregularities.
- 10.3. The low bid shall be determined on the basis of the lowest Base Bid or the lowest combination of Base Bid and Alternate Bids, accepted in consecutive order.
- 10.4. The Owner shall award such contract to the lowest responsible bidder (18-1-102 MCA).
  - 10.4.1. The Owner may make such investigations as it deems necessary to determine whether or not any or all bidders are responsible.
  - 10.4.2. The term "responsible" does not refer to pecuniary ability only, nor the ability to tender sufficient performance and payment bonds.
  - 10.4.3. The term "responsible" includes, but is not limited to:
    - 10.4.3.1. Having adequate financial resources to perform the contract or the ability to obtain them;
    - 10.4.3.2. Being able to comply with the required delivery, duration, and performance schedule;
    - 10.4.3.3. Having a satisfactory record of integrity and business ethics;
    - 10.4.3.4. Having the necessary organization, experience, accounting, and operational controls;
    - 10.4.3.5. Having the necessary production, construction, technical equipment, and facilities; and,
    - 10.4.3.6. Having the technical skill, ability, capacity, integrity, performance, experience, lack of claims and disputes, lack of actions on bonds, lack of mediations, arbitrations and/or lawsuits related to construction work or performance, and such like.
  - 10.4.4. Bidders shall furnish to the Owner all information and data for this purpose as the Owner may request.
  - 10.4.5. The Owner reserves the right to reject any bid if the investigation or evidence of any Bidder fails to satisfy the Owner that such Bidder is properly and adequately qualified to suitably perform and satisfactorily execute the obligations of the Contract and Work defined in the Contract Documents.
- 10.5. The Owner shall award such contract to the lowest responsible bidder without regard to residency except on a reciprocal basis: a resident bidder will be allowed a preference on a contract against the bid of any non-resident bidder from any state or country that enforces a preference for resident bidders. The preference given to resident bidders of the State of Montana must be equal to the preference given in the other state or country (18-1-102, MCA). This does not apply when prohibited by Federal requirements.
- 10.6. The State of Montana may negotiate deductive changes, not to exceed 15% of the total cost of the project, with the lowest responsible bidder when the lowest responsible bids causes the project cost to exceed the appropriation; or with the lowest responsible bidders if multiple contracts will be awarded on the projects when the total of the lowest responsible bids causes the project cost to exceed the appropriation. A bidder is not required to negotiate his bid but is required to honor his bid for the time specified in the bidding documents. The Owner may terminate negotiations at any time (18-2-105(7) MCA).

## 11. Contract

- 11.1. The sample Standard Form of Contract between Contractor and Owner, as issued by the Owner, will be used as the contracting instrument and is bound within the Contract Documents.
- 11.2. The form shall be signed by a proper representative of the bidder as defined above in these instructions.
- 11.3. The contractor shall also complete and return a federal form W-9 with the Contract.

## 12. Performance, Labor and Material Payment Security

- 12.1. IF THE PROJECT COST IS LESS THAN \$25,000, AT ITS SOLE DISCRETION THE STATE OF MONTANA MAY OR MAY NOT REQUIRE A PERFORMANCE OR LABOR AND MATERIAL PAYMENT SECURITY (18-2-201 MCA). **(MSU REQUIRES BONDS ON ALL PROJECTS ABOVE \$150,000.)**
- 12.2. THE CONTRACTOR SHALL PROVIDE BOTH SECURITIES FOR THIS PROJECT AS SPECIFIED BELOW, UNLESS SPECIFICALLY DIRECTED THAT THIS REQUIREMENT HAS BEEN WAIVED ELSEWHERE IN THESE DOCUMENTS.
- 12.3. The Owner shall require the successful bidder to furnish a Performance Bond in the amount of 100% of the contract price as security for the faithful performance of his contract, should the agreed upon value exceed \$150,000 (18-2-201, MCA).
- 12.4. The Owner shall require the successful bidder to furnish a Labor and Material Payment Bond in the amount of 100% of the contract price as security for the payment of all persons performing labor and furnishing materials in connection therewith (18-2-201 MCA), if the total contract value exceeds \$150,000.
- 12.5. The bonds shall be executed on forms furnished by the Owner. No other forms will be acceptable.
- 12.6. The bonds shall be signed in compliance with State statutes (33-17-111 MCA).
- 12.7. Bonds shall be secured from a State licensed bonding company.
- 12.8. Power of Attorney
  - 12.8.1. Attorneys-in-fact who sign contract bonds must file with each bond a certified and effectively dated copy of their power of attorney;
  - 12.8.2. One original copy shall be furnished with each set of bonds.
  - 12.8.3. Others furnished with a set of bonds may be copies of that original.
13. Notice To Proceed
  - 13.1. The successful bidder who is awarded the contract for construction will not be issued a Notice to Proceed until there is a signed Contract, the specified insurance certificates and a copy of the bidder's current Construction Contractor Registration Certificate in the Owner's possession. All items are required within fifteen (15) calendar days of contract award made by the Owner.
14. Laws and Regulations
  - 14.1. The bidders' attention is directed to the fact that all applicable federal and state laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over the project shall apply to the contract throughout and will be deemed to be included in this contract as if bound herein in full.
15. Payments
  - 15.1. NOTICE OF APPROVAL OF PAYMENT REQUEST PROVISION. Per Title 28, Chapter 2, Part 21, this contract allows the Owner to change the number of days to approve a Contractor's payment request. This contract allows the Owner to approve the Contractor's payment request within thirty-five (35) calendar days after it is received by the Owner without being subject to the accrual of interest.
16. Buy Safe Montana Provisions
  - 16.1. The successful bidder who is awarded the contract for construction shall provide their incident rate, experience modification ratio (EMR) and loss ratio via the Buy-Safe Montana form with the Award documents.
17. Time of Completion
  - 17.1. Bidder agrees to commence work immediately upon receipt of the Notice to Proceed and to substantially complete the project **by November 15, 2024.**

17.2. If liquidated damages are assessed for exceeding the completion date, they shall accrue at the rate of **ONE HUNDRED AND NO/100 (\$100.00) DOLLARS** per calendar day. Liquidated damages charges will be deducted from the amount due the Contractor

**~END OF INSTRUCTIONS~**



UNIVERSITY FACILITIES MANAGEMENT

Sixth Avenue and Grant Street • P.O. Box 172760 • Bozeman, Montana 59717-2760
Phone: (406) 994-5413 • Fax: (406) 994-5665

BID PROPOSAL

Cobleigh Hall – Cold Chambers Cooling Tower Replacement
PPA No. 18-2194

TO:
State of Montana, Montana State University
University Facilities Management
Attn: Contract Administrator
Plew Building, 6th & Grant, PO Box 172760
Bozeman, Montana 59717-2760

Prospective Bidders:

The undersigned, having familiarized themselves with the Contract Documents, site, location, and conditions of the Work as prepared by McKinstry, 620 West Addison St. Missoula, MT 58802, (406) 274-2325, by submission of this Bid Proposal, hereby agrees to provide all materials, systems, equipment and labor necessary to complete the Work for the total sum as follows:

BASE BID:

\_\_\_\_\_ and \_\_\_\_ /100 DOLLARS.
(ALPHA notation) \$ \_\_\_\_\_ (NUMERIC notation)

This bidder acknowledges receipt of the following addenda:

ADDENDUM No.: \_\_\_\_\_ Dated: \_\_\_\_\_
ADDENDUM No.: \_\_\_\_\_ Dated: \_\_\_\_\_
ADDENDUM No.: \_\_\_\_\_ Dated: \_\_\_\_\_

By signing below, the bidder agrees to all terms specified and AGREES TO fulfill the requirements of the CONTRACT in strict accordance with the bidding documents.

Company Name: \_\_\_\_\_

Business Address: \_\_\_\_\_

Construction Contractor
Registration No.: \_\_\_\_\_

Phone No.: \_\_\_\_\_

Fax No.: \_\_\_\_\_

Email: \_\_\_\_\_

Date: \_\_\_\_\_

Bid Proposals entitled to consideration shall be signed by the proper representative of the firm submitting the proposal as follows (Initial which requirement you meet):

- The principal of a single owner firm;
- A principal of a partnership firm;
- An officer of an incorporated firm, or an agent whose signature is accompanied by a certified copy of the resolution of the Board of Directors authorizing that agent to sign; or (attach a copy of the resolution),
- Other persons signing for a single-owner firm or a partnership shall attach a power-of-attorney evidencing his authority to sign for that firm.

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

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# GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

(Form Revision Date: November 2023)

## ARTICLE 1 – GENERAL PROVISIONS

### 1.1. BASIC DEFINITIONS

1.1.1. **CONTRACT DOCUMENTS.** The Contract Documents consist of the Contract between Owner and Contractor (hereinafter the “Contract”), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Contract and Modifications issued after execution of the Contract. A Modification is: (1) a written amendment to the Contract signed by both parties; (2) a Change Order; (3) a Construction Change Directive; or, (4) a written order for a minor change in the Work issued by the Architect/Engineer. The Contract Documents shall include the bidding documents and any alterations made thereto by addenda. In the event of a conflict, discrepancy, contradiction, or inconsistency within the Contract Documents and for the resolution of same, the following order of hierarchy and control shall apply and prevail:

1) Contract; 2) Addenda; 3) Supplementary General Conditions; 4) General Conditions; 5) Specifications; 6) Drawings; 7) Instructions to Bidders; 8) Invitation To Bid; 9) Sample Forms.

1.1.1.1. If a conflict, discrepancy, contradiction, or inconsistency occurs within or between the Specifications and the Drawings, resolution shall be controlled by the following:

1.1.1.1.1. As between figures, dimensions, or numbers given on drawings and any scaled measurements, the figures, dimensions, or numbers shall govern;

1.1.1.1.2. As between large scale drawings and small scale drawings, the larger scale drawings shall govern;

1.1.1.1.3. As between the technical specifications and drawings; the technical specifications shall govern.

1.1.1.1.4. Shop Drawings and Submittals: Shop drawings and other submittals from the Contractor, subcontractors, or suppliers do not constitute a part of the Contract Documents.

1.1.1.2. The Contractor acknowledges, understands and agrees that the Contract Documents cannot be changed except as provided herein by the terms of the Contract. No act(s), action(s), omission(s), or course of dealing(s) by the Owner or Architect/Engineer with the Contractor shall alter the requirements of the Contract Documents and that alteration can be accomplished only through a written Modification process defined herein.

1.1.2. **THE DRAWINGS.** The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, intent, location, and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

1.1.3. **THE SPECIFICATIONS.** The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

1.1.4. **THE CONTRACT.** The entire Contract for Construction is formed by the Contract Documents. The Contract represents the entire, complete, and integrated agreement between the Owner and Contractor.



hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind between: (1) the Architect/Engineer and Contractor; (2) the Owner and any Subcontractor, Sub-subcontractor, or Supplier; (3) the Owner and Architect/Engineer; or, (4) between any persons or entities other than the Owner and Contractor. However, the Architect/Engineer shall at all times be permitted and entitled to performance and enforcement of its obligations under the Contract intended to facilitate performance of the Architect/Engineer's duties.

1.1.5. THE WORK. The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to completely fulfill the Contract and the Contractor's obligations. The Work may constitute the whole or a part of the Project.

1.1.6. THE PROJECT. The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner or by separate contractors.

1.1.7. TIME. Time is of the essence in performance, coordination, and completion of the Work contemplated herein. The Owner may suffer damages if the Work is not completed as specified herein. When any duration or time period is referred to in the Contract Documents by days, the first day of a duration or time period shall be determined as the day following the current day of any event or notice starting a specified duration. All durations in the Contract Documents are calendar days unless specifically stated otherwise.

## 1.2. **CORRELATION, INTER-RELATIONSHIP, AND INTENT OF THE CONTRACT DOCUMENTS**

1.2.1. The intent of the Contract Documents is to include all items and all effort necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary and inter-related, and what is required by one shall be as binding as if required by all. Performance by the Contractor shall be required to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

1.2.2. Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. It is the Contractor's responsibility to control the Work under the Contract.

1.2.3. Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

## 1.3. **CAPITALIZATION**

1.3.1. Terms capitalized in these General Conditions include those which are: (1) specifically defined; and, (2) the titles of numbered articles and identified references to Paragraphs, Subparagraphs and Clauses in the document.

## 1.4. **INTERPRETATION**

1.4.1. In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

## 1.5. **EXECUTION OF THE CONTRACT AND CONTRACT DOCUMENTS**

1.5.1. The Contract shall be signed by the Owner and Contractor. Execution of the Contract by the Contractor constitutes the complete and irrevocable binding of the Contractor and his Surety to the Owner for complete performance of the Work and fulfillment of all obligations. By execution of the Contract, the Contractor acknowledges that it has reviewed and familiarized itself with all aspects of the Contract Documents and agrees to be bound by the terms and conditions contained therein.

- 1.5.2. Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.
- 1.5.3. The Contractor acknowledges that it has taken all reasonable actions necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to: (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, gas, electric power, phone service, and roads; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation, topography, and conditions of the ground; and, (5) the character of equipment and facilities needed for performance of the Work. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory geotechnical work done by the Owner, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the action described and acknowledged in this paragraph will not relieve the Contractor from responsibility for properly ascertaining and estimating the difficulty and cost of successfully performing the Work or for proceeding to successfully perform the Work without additional expense to the Owner.
- 1.5.4. The Owner assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Owner, nor does the Owner assume responsibility for any understanding reached or representation made by any of its officers, agents, or employees concerning conditions which can affect the Work unless that understanding or representation is expressly stated in the Contract Documents.
  - 1.5.4.1. Performance of any portion of the Work beyond that required for complying with the specifications and all other requirements of the Contract, shall be deemed to be for the convenience of the Contractor and shall be at the Contractor's sole expense.
  - 1.5.4.2. There shall be no increase in the contract price or time allowed for performance which is for the convenience of the Contractor.

1.6. **OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS, AND OTHER INSTRUMENTS OF SERVICE**

- 1.6.1. The Drawings, Specifications and other documents, including those in electronic form, prepared by the Architect/Engineer and the Architect/Engineer's consultants are Instruments of Service through which the Work to be executed by the Contractor is described. The Contractor may retain one record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications and other documents prepared by the Architect/Engineer or the Architect/Engineer's consultants. Unless otherwise indicated, the Architect/Engineer and the Architect/Engineer's consultants shall be deemed the authors of them and will retain all common law, statutory and other reserved rights, in addition to the copyrights except as defined in the Owner's Contract with the Architect/Engineer. All copies of Instruments of Service, except the Contractor's record set, shall be returned or suitably accounted for to the Architect/Engineer upon completion of the Work. The Drawings, Specifications and other documents prepared by the Architect/Engineer and the Architect/Engineer's consultants, and copies thereof furnished to the Contractor, are for use solely with respect to this Project. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or material or equipment supplier on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect/Engineer, and the Architect/Engineer's consultants. The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect/Engineer and the Architect/Engineer's consultants appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the Drawings Specifications and other documents prepared by the Architect/Engineer and the Architect/Engineer's consultants. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect/Engineer's or Architect/Engineer's consultants' copyrights or other reserved rights.

- 1.6.2. Owner's Disclaimer of Warranty: The Owner has requested the Architect/Engineer prepare the Contract Documents for the Project which are adequate for bidding and constructing the Project. However, the Owner makes no representation, guarantee, or warranty of any nature whatsoever to the Contractor concerning such documents. The Contractor hereby acknowledges and represents that it has not, does not, and will not rely upon any such representation, guarantee, or warranty concerning the Contract Documents as no such representation, guarantee, or warranty have been or are hereby made.

## **ARTICLE 2 – THE OWNER**

### **2.1. THE STATE OF MONTANA**

- 2.1.1. The Owner is the State of Montana and is the sole entity to be identified as Owner in the Contract and as referred to throughout the Contract Documents as if singular in number.
- 2.1.2. Except as otherwise provided in Subparagraph 4.2.1, the Architect/Engineer does not have authority to bind the Owner. The observations and participations of the Owner or its authorized representative do not alleviate any responsibility on the part of the Contractor. The Owner reserves the right to observe the work and make comment. Any action or lack of action by the Owner shall not be construed as approval of the Contractor's performance.
- 2.1.3. The Owner reserves the right to require the Contractor, all sub-contractors and material suppliers to provide lien releases at any time. The Owner reserves the right to withhold progress payments until such lien releases are received for all work for which prior progress payments have been made. Upon the Owner's demand for lien releases (either verbally or written), the Contractor, all sub-contractors and material suppliers shall provide such releases with every subsequent application for payment through Final Acceptance of the Project.
- 2.1.4. Except for permits and fees, including those required under Subparagraph 3.7.1, which are the responsibility of the Contractor under the Contract Documents, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.
- 2.1.5. Information or services required of the Owner by the Contract Documents shall be furnished by the Owner with reasonable promptness. Any other information or services relevant to the Contractor's performance of the Work under the Owner's control shall be furnished by the Owner after receipt from the Contractor of a written request for such information or services.
- 2.1.6. Unless otherwise provided in the Contract Documents, the Contractor will be furnished electronic copies of Drawings and Specifications as are reasonably necessary for execution of the Work.

### **2.2. OWNER'S RIGHT TO STOP WORK**

- 2.2.1. If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents as required by Paragraph 12.2 or persistently fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated. However, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Subparagraph 6.1.3. The issuance of a stop work order by the Owner shall not give rise to a claim by the Contractor or any subcontractor for additional cost, time, or other adjustment.

### **2.3. OWNER'S RIGHT TO CARRY OUT THE WORK**

- 2.3.1. If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may after such seven-day period give the Contractor a second written notice to correct such deficiencies within a three-day period. If the Contractor within such three-day period after receipt of such second notice fails to commence and continue to correct any deficiencies, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be

issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and increased costs, and compensation for the Architect/Engineer's additional services made necessary by such default, neglect, or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

#### 2.4. **OWNER'S RIGHT TO PERSONNEL**

- 2.4.1. The Owner reserves the right to have the Contractor and/or subcontractors remove person(s) and/or personnel from any and all work on the project with cause but without cost to the Owner. Such requests from the Owner may be made verbally or in writing and may be done directly with the Contractor or indirectly through the Architect/Engineer. Cause may be, but not limited to, any of the following: incompetence, poor workmanship, poor scheduling abilities, poor coordination, disruption to the facility or others, poor management, causes delay or delays, disruption of the Project, will not strictly adhere to facility procedures and Project requirements either knowingly or unknowingly, insubordination, drug/alcohol use, possession of contraband, belligerent acts or actions, etc. The Contractor shall provide replacement person(s) and/or personnel acceptable to the Owner at no cost to the Owner.
- 2.4.2. Any issue or circumstance relating to or resulting out of this clause shall not be construed or interpreted to be interference with or impacting upon the Contractor's responsibilities and liabilities under the Contract Documents.
- 2.4.3. Person(s) and/or personnel who do not perform in accordance with the Contract Documents, shall be deemed to have provided the Owner with cause to have such persons removed from any and all involvement in the Work.
- 2.4.4. The Contractor agrees to indemnify and hold harmless the Owner from any and all causes of action, demands, claims, damages, awards, attorneys' fees, and other costs brought against the Owner and/or Architect/Engineer by any and all person(s) or personnel as a result of actions under this clause.

### **ARTICLE 3 – THE CONTRACTOR**

#### 3.1. **GENERAL**

- 3.1.1. The Contractor is the person or entity identified as such in the Contract and is referred to throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative.
- 3.1.2. Construction Contractor Registration: The Contractor is required to be registered with the Department of Labor and Industry under 39-9-201 and 39-9-204 MCA prior to the Contract being executed by the Owner. A bidder must demonstrate that it has registered or promises that it will register immediately upon notice of award and prior to the commencement of any work. If the prevailing bidder cannot or does not register in time for the Owner to execute the Contract within fifteen (15) days of the date on the notice of award, the Owner may award, at its sole discretion, to the next lowest responsible bidder who meets this requirement. The Owner will not execute a contract for construction nor issue a Notice to Proceed to a Contractor who is not registered per 39-9-401(a) MCA. It is solely the Contractor's responsibility to ensure that all Subcontractors are registered in accordance with Title 39, Chapter 9, MCA.
- 3.1.3. The Owner's engagement of the Contractor is based upon the Contractor's representations by submission of a bid to the Owner that it:
  - 3.1.3.1. has the requisite skills, judgment, capacity, expertise, and financial ability to perform the Work;
  - 3.1.3.2. is experienced in the type of labor and services the Owner is engaging the Contractor to perform;
  - 3.1.3.3. is authorized, licensed and registered to perform the type of labor and services for which it is being engaged in the State and locality in which the Project is located;

- 3.1.3.4. is qualified, willing and able to perform the labor and services for the Project in the manner and scope defined in the Contract Documents; and,
- 3.1.3.5. has the expertise and ability to provide labor and services that will meet the Owner's objectives, intent and requirements, and will comply with the requirements of all governmental, public, and quasi-public authorities and agencies having or asserting jurisdiction over the Project.
- 3.1.4. The Contractor shall perform the Work in accordance with the Contract Documents.
- 3.1.5. The Contractor shall provide on minimum of a bi-weekly basis the onsite Superintendent's daily reports/logs
- 3.1.6. The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect/Engineer in the Architect/Engineer's administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.
- 3.1.7. Quality Control (i.e. ensuring compliance with the Contract Documents) and Quality Assurance (i.e. confirming compliance with the Contract Documents) are the responsibility of the Contractor. Testing, observations, and/or inspections performed or provided by the Owner are solely for the Owner's own purposes and are for the benefit of the Owner. The Owner is not liable or responsible in any form or fashion to the Contractor regarding quality control or assurance or extent of such assurances. The Contractor shall not, under any circumstances, rely upon the Owner's testing or inspections as a substitute or in lieu of its own Quality Control or Assurance programs.
- 3.1.8. Buy-Safe Montana Provision: The Owner shall review the Buy-Safe Montana Form provided by the Bidder under Articles 16 of the Instructions to Bidders. To promote a safe work environment, the Owner encourages an incidence rate less than the latest average for non-residential building construction for Montana as established by the federal Bureau of Labor Statistics for the prior year; an experience modification rating (EMR) less than 1.0; and a loss ratio of less than 100%. The Contractor with a greater-than-average incidence rate, an EMR greater than 1.0, and a loss ratio of more than 100% shall schedule and obtain a Comprehensive Safety Consultation from the Montana Department of Labor & Industry, Employment Relations Division, Safety Bureau before the Owner grants Substantial Completion of the Work. For assistance in obtaining the Comprehensive Safety Consultation, visit <http://erd.dli.mt.gov/safety-health/onsite-consultation>.

## 3.2. **REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR**

- 3.2.1. Since the Contract Documents are complementary and inter-related, before starting each portion of the Work, the Contractor shall carefully study and compare the various Drawings and other Contract Documents relative to that portion of the Work, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions affecting the Work. These obligations are for the purpose of facilitating construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents. However, any errors, inconsistencies or omissions discovered by the Contractor shall be reported promptly to the Architect/Engineer as a request for information in such form as the Architect/Engineer may require.
- 3.2.2. Any errors or omissions noted by the Contractor during this review shall be reported promptly to the Architect/Engineer, but it is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional unless otherwise specifically provided in the Contract Documents.
- 3.2.3. If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Architect/Engineer in response to the Contractor's notices or requests for information pursuant to Subparagraphs 3.2.1 and 3.2.2, the Contractor shall make Claims as provided in Subparagraphs 4.3.4 and 4.3.5. If the Contractor fails to perform the obligations of Subparagraphs 3.2.1 and 3.2.2, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. The Contractor shall not be liable to the Owner or Architect/Engineer for damages resulting from errors, inconsistencies, or omissions in the Contract Documents or for differences between field measurements or conditions and the Contract Documents

unless the Contractor recognized such error, inconsistency, omission or difference and failed to report it to the Architect/Engineer.

- 3.2.4. Except as otherwise expressly provided in this Contract, the Contractor assumes all risks, liabilities, costs, and consequences of performing any effort or work in accordance with any written or oral order (including but not limited to direction, instruction, interpretation, or determination) of a person not authorized in writing by the Owner to issue such an order.
- 3.2.5. By entering into this Contract, the Contractor acknowledges that it has informed itself fully regarding the requirements of the Drawings and Specifications, the General Conditions, the Supplementary General Conditions, all other documents comprising a part of the Contract Documents and all applicable laws, building codes, ordinances and regulations. Contractor hereby expressly acknowledges, guarantees, and warrants to the Owner that:
  - 3.2.5.1. the Contract Documents are sufficient in detail and scope to enable Contractor to construct the finished project;
  - 3.2.5.2. no additional or further work should be required by Owner at the time of Owner's acceptance of the Work; and,
  - 3.2.5.3. when the Contractor's work is finished and the Owner accepts, the Work will be complete and fit for the purpose intended by the Contract Documents. This acknowledgment and guarantee does not imply that the Contractor is assuming responsibilities of the Architect/Engineer.
- 3.2.6. Sufficiency of Contract Documents: Prior to submission of its bid, and in all events prior to and upon signing the Contract, the Contractor certifies, warrants and guarantees that it has received, carefully reviewed, and evaluated all aspects of the Contract Documents and agrees that said Documents are adequate, consistent, coordinated, and sufficient for bidding and constructing the Work requested, intended, conceived, and contemplated therein.
  - 3.2.6.1. The Contractor further acknowledges its continuing duty to review and evaluate the Contract Documents during the performance of its services and shall immediately notify the Architect/Engineer of any problems, conflicts, defects, deficiencies, inconsistencies, errors, or omissions it discovers in the Contract Documents and the Work to be constructed; and, any variances it discovers between the Contract Documents and applicable laws, statutes, building codes, rules or regulations.
  - 3.2.6.2. If the Contractor performs any Work which it knows or should have known due to its experience, ability, qualifications, and expertise in the construction industry, that involves problems, conflicts, defects, deficiencies, inconsistencies, errors, or omissions in the Contract Documents and the Work to be constructed and, any variances between the Contract Documents and applicable laws, statutes, building codes, rules or regulations, without prior written notification to the Architect/Engineer and without prior authorization to proceed from the Architect/Engineer, the Contractor shall be responsible for and bear the costs and delays (including costs of any delay) of performing such Work and all corrective actions as directed by the Architect/Engineer.
  - 3.2.6.3. Any and all claims resulting from the Contractor's failure, including those of any subcontractor or supplier, to carefully review, evaluate, and become familiar with all aspects of the Contract Documents shall be deemed void and waived by the Contractor.
- 3.2.7. Sufficiency of Site Conditions: Prior to submission of its bid, and in all events prior to and upon signing the Contract, the Contractor certifies, warrants and guarantees that it has visited, carefully reviewed, evaluated, and become familiar with all aspects of the site and local conditions at which the Project is to be constructed. The Contractor agrees that the Contract Documents are an adequate, consistent, coordinated, and sufficient representation of the site and local conditions for the Work.
  - 3.2.7.1. The Contractor has reviewed and become familiar with all aspects with the Site Survey and Geotechnical Report for the Project and has a full understanding of the information provided therein.

- 3.2.7.2. If the Work involves modifications, renovations, or remodeling of an existing structure(s) or other man-made feature(s), the Contractor certifies, warrants and guarantees that it has reviewed, evaluated, and become familiar with all available as-built and record drawings, plans and specifications, and has thoroughly inspected and become familiar with the structure(s) or man-made feature(s).
- 3.2.7.3. Any and all claims resulting from the Contractor's failure, including those of any subcontractor or supplier, to visit, carefully review, evaluate, and become familiar with all aspects of the site, available geotechnical information, and local conditions at which the Project is to be constructed shall be deemed void and waived by the Contractor.

### **3.3. SUPERVISION AND CONSTRUCTION PROCEDURES**

- 3.3.1. The Contractor shall supervise and direct the Work using the Contractor's best skill and attention recognizing that time and quality are of the essence of the Work. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. It is the responsibility of and incumbent upon the Contractor to ensure, confirm, coordinate, inspect and oversee all Work (which is inclusive of but not limited to all submittals, change orders, schedules, workmanship, and appropriate staffing with enough competent and qualified personnel) so that the Work is not impacted in terms of any delays, costs, damages, or additional time, or effort on the part Architect/Engineer or Owner. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect/Engineer and shall not proceed with that portion of the Work without further written instructions from the Architect/Engineer. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Architect/Engineer or Owner as appropriate shall be solely responsible for any resulting loss or damage. The Contractor will be required to: review any specified construction or installation procedure; advise the Architect/Engineer if the specified procedure deviates from good construction practice; to advise the Architect/Engineer if following the procedure will affect any warranties, including the Contractor's general warranty, or of any objections the Contractor may have to the procedure and shall propose any alternative procedure which the Contractor will warrant and guarantee. The Contractor is required to: review any specified construction or installation procedure; advise the Architect/Engineer if the specified procedure deviates from good construction practice; to advise the Architect/Engineer if following the procedure will affect any warranties, including the Contractor's general warranty, or of any objections the Contractor may have to the procedure and to propose any alternative procedure which the Contractor will warrant.
- 3.3.2. The Contractor shall furnish management, supervision, coordination, labor and services that: (1) expeditiously, economically, and properly completes the Work; (2) comply with all requirements of the Contract Documents; and, (3) are performed in a quality workmanlike manner and in accordance with the standards currently practiced by persons and entities performing or providing comparable management, supervision, labor and services on projects of similar size, complexity, cost, and nature to this Project. However, the standards currently practiced within the construction industry shall not relieve the Contractor of the responsibility to perform the Work to the level of quality, detail, and excellence defined and intended by the Contract Documents as interpreted by the Architect/Engineer.
- 3.3.3. All services and labor rendered by the Contractor, including any subcontractors or suppliers, shall be performed under the immediate supervision at the site of persons possessing expertise and the requisite knowledge in the discipline or trade of service being rendered. The Contractor shall maintain such supervision and personnel at all times that the Contractor's personnel, subcontractors, and/or suppliers are at the site. The Contractor shall never be absent from the site during performance of any portion of the Work by any entity under the supervision and direction of the Contractor. Full time attendance by the Contractor from Notice to Proceed through Final Acceptance is an explicit requirement of this Contract.



- 3.3.4. The Contractor shall be responsible to the Owner for acts, damages, errors, and omissions of the Contractor's employees, subcontractors and their agents and employees, and other persons or entities performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors.
- 3.3.5. The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

#### 3.4. **LABOR, WAGES, AND MATERIALS**

- 3.4.1. Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, permits, licenses, goods, products, equipment, tools, construction equipment and machinery, water, heat, all utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work in accordance with the Contract Documents, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.
- 3.4.2. The Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect/Engineer and in accordance with a Change Order. This opportunity to request substitutions does not negate or waive any requirement for the Contractor to follow a pre-bidding "prior approval" requirement nor obligate the Owner to approve any substitution request.
- 3.4.3. The Contractor shall enforce strict discipline, appropriate behavior, and good order among the Contractor's employees, subcontractors at every tier and level, and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.
- 3.4.4. Prevailing Wages and Montana Residents.
  - 3.4.4.1. The Contractor and all subcontractors at any level or tier of the Work shall give preference to the employment of bona fide Montana residents in the performance of the Work and shall pay the standard prevailing rate of wages, including fringe benefits for health and welfare and pension contributions and travel allowance provisions in effect and applicable to the county or locality in which the work is being performed. (18-2-403, MCA)
  - 3.4.4.2. At least 50% of the workers, as defined by the Department of Labor & Industry (DOLI), must be bona fide Montana residents. (18-2-401, 18-2-402, MCA)
  - 3.4.4.3. Indian Employment Preference within the Boundaries of an Indian Reservation. All contractors that are awarded a state agency construction contract within the exterior boundaries of an Indian Reservation shall extend a hiring preference to qualified Indians as provided herein:
    - 3.4.4.3.1. "State agency" means a department, office, board, bureau, commission, agency, or other instrumentality of the executive or judicial branches of the government of this State. "Indian" means a person who is enrolled or who is a lineal descendent of a person enrolled in an enrollment listing of the Bureau of Indian Affairs or in the enrollment listing of a recognized Indian tribe domiciled in the United States.
    - 3.4.4.3.2. Qualified Indians – Employment Criteria: An Indian shall be qualified for employment in a permanent, temporary, or seasonal position if he or she has substantially equal qualifications for any position and resides on the reservation where the construction contract is to be performed.
    - 3.4.4.3.3. Non-Applicability: The Indian Employment Preference Policy does not apply to a project partially funded with federal-aid money from the United States Department of Transportation or when residency preference laws are specifically prohibited by federal law. It does not apply to independent contractors and their employees, student interns, elected officials, or appointed positions.
  - 3.4.4.4. The Commissioner of The Montana Department of Labor and Industry (DOLI) has established the standard prevailing rate of wages in accordance with 18-2-401 and 18-2-402, MCA. A copy of the Rates entitled "State of Montana, Prevailing Wage Rates" are bound herein. The Commissioner of the Montana DOLI has established the resident requirements in accordance with 18-2-409, MCA. The Contractor and all subcontractors at any level or tier of the Work

shall direct any and all questions concerning prevailing wage and Montana resident issues for all aspects of the Work to DOLI.

- 3.4.4.5. The Contractor and all subcontractors at any tier or level of the Work, and as determined by the Montana DOLI, shall classify all workers in the project in accordance with the State of Montana, Prevailing Wage Rates. In the event the Contractor is unable to classify a worker in accordance with these rates he shall contact DOLI for a determination of the classification and the prevailing wage rate to be paid.
- 3.4.4.6. The Contractor and all subcontractors at any tier or level of the Work shall be responsible for obtaining wage rates for all workers prior to their performing any work on the project. The Contractor is required to pay and insure that its subcontractors at any tier or level and others also pay the prevailing wage determined by the DOLI, insofar as required by Title 18 of the MCA and the pertinent rules and standards of DOLI.
- 3.4.4.7. It is not the responsibility of the Owner to determine who classifies as a subcontractor, sub-subcontractor, material man, supplier, or any other person involved in any aspect of the Work at any tier or level. All such determinations shall be the sole responsibility of the Contractor, subcontractors, sub-subcontractors, material men, suppliers and others involved in the project at any tier or level. The Contractor, subcontractors, sub-subcontractors, material men, suppliers and others involved in the project shall indemnify and hold harmless the Owner from all claims, attorneys' fees, damages and/or awards involving prevailing wage or Montana resident issues. Any changes to wages or penalties for failure to pay the correct wages will be the sole responsibility of the Contractor and/or his subcontractors and no further charges or claims shall be made to the Owner. If the parties mutually agree or an arbitrator or court determines that any change in wages is due and any part is attributable to the Owner, the Owner's sole liability shall be for the amount of wages ordered only and not for other expenses, charges, penalties, overhead, profit or other mark-ups.
- 3.4.4.8. In accordance with 18-2-422(1) MCA, each job classification's standard prevailing wage rate, including fringe benefits, that the contractors and employers shall pay during construction of the project is included herein by both reference to DOLI's "Building" or "Heavy/Highway" schedules and as part of these Contract Documents.
- 3.4.4.9. The Contractor and every employer, including all subcontractors at any tier or level, is required by 18-2-422(2) MCA to maintain payroll records in a manner readily capable of being certified for submission under 18-2-423 MCA, for a period of not less than 3 years after the contractor's, subcontractor's, or employer's completion of work on the project or the Final Acceptance by the Owner, whichever is later.
- 3.4.4.10. Each contractor is required by 18-2-422(3) MCA to post in a visible and accessible location a statement of all wages and fringe benefits in compliance with 18-2-423.
- 3.4.4.11. The contractor and all subcontractors are required by MCA 18-2-417 to make wage rate adjustments for projects with a construction duration exceeding 30 months.

### 3.5. **WARRANTY AND GUARANTEE**

- 3.5.1. The Contractor warrants to the Owner and Architect/Engineer that materials and equipment furnished under the Contract will be new and of good quality unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective and rejected. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect/Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.
- 3.5.2. The Contractor shall and does hereby warrant and guarantee all work, workmanship, and materials for the full warranty period as specified in the Contract Documents. The warranty period shall be defined as

commencing with Substantial Completion (or with each Substantial Completion if there is more than one) of the Project, or any portion thereof, and continuing for one (1) calendar year from the date of Final Acceptance of the entire project by the Owner. The date of Final Acceptance shall be the date of the Architect/Engineer's signature on the final request for payment unless otherwise agreed upon in writing for the entire project or any portion thereof, by the Owner, Architect/Engineer and Contractor.

- 3.5.3. In addition to the one (1) calendar year warranty and guarantee specified in this herein above, the Contractor warrants and guarantees all materials and workmanship for the roofing system for a period of two (2) calendar years from the date of Final Acceptance. This warranty shall cover all labor and materials for roof and roofing finish systems (e.g. flashing, terminations, parapet caps, etc.) repairs from moisture penetration and/or defects in workmanship.
- 3.5.4. Manufacturer and product warranties and guarantees, as provided by the manufacturer or as specified in the Contract Documents, are in addition to the Contractor's warranty.

### 3.6. **TAXES**

- 3.6.1. The Contractor is responsible for and shall pay all sales, consumer, use, and similar taxes for the Work provided by the Contractor which are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.
- 3.6.2. In compliance with 15-50-206 MCA, the Contractor will have 1% of his **gross** receipts withheld by the Owner from all payments due and sent to the Montana Department of Revenue. Each subcontractor who performs work greater than \$80,000 shall have 1% of its gross receipts withheld by the Contractor and sent to the Montana Department of Revenue. The Contractor shall notify the Department of Revenue on the Department's prescribed form.

### 3.7. **PERMITS, FEES, AND NOTICES**

- 3.7.1. Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work which are customarily secured after execution of the Contract, including but not limited to, the building permit fee, electrical, plumbing, sewer connection fee and mechanical permit fee, and any required impact fees and which are legally required when bids are received or negotiations concluded.
- 3.7.2. The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and lawful orders of public authorities applicable to performance of the Work.
- 3.7.3. If the Contractor performs Work knowing it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations, and does so without providing notice to the Architect/Engineer and Owner, the Contractor shall assume responsibility for such Work and shall bear the costs attributable to correction. The Contractor shall be solely responsible to insure that all work it performs is in full compliance with all prevailing and applicable codes and regulations.
- 3.7.4. Incident Reporting: The Contractor shall immediately notify the Owner and Architect/Engineer, both orally and in writing, of the nature and details of all incidents which may adversely affect the quality or progress of the Work, including, but not limited to, union disputes, accidents, delays, damages to Work, and other significant occurrences. Such notices are in addition to any other notices required regarding claims.

### 3.8. **ALLOWANCES**

- 3.8.1. The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct.
- 3.8.2. Unless otherwise provided in the Contract Documents:
  - 3.8.2.1. allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

3.8.2.2. Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included by the Contractor in the Contract Sum but not in the allowances;

3.8.2.3. whenever costs are more than or less than stated allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect: (1) the difference between actual costs and the allowances under Clause 3.8.2.1; and, (2) changes in Contractor's costs under Clause 3.8.2.2.

3.8.3. Materials and equipment under an allowance shall be selected by the Owner.

### 3.9. **CONTRACTOR'S PERSONNEL**

3.9.1. The Contractor shall employ competent personnel, supervisors, project managers, project engineers, project superintendent, and all others who shall be assigned to the Work throughout its duration. Contractor's personnel extend to those employed by the Contractor whether at the site or not. The Owner shall have right to review and approve or reject all replacement of Contractor's personnel. All personnel assigned by the Contractor to the Work shall possess the requisite experience, skills, abilities, knowledge, and integrity to perform the Work.

3.9.2. The superintendent and others as assigned shall be in attendance at the Project site during the performance of any and all Work. The superintendent shall represent the Contractor. All communications given to the Contractor's personnel such as the project manager or the superintendent, whether verbal, electronic or written, shall be as binding as if given to the Contractor.

3.9.3. It is the Contractor's responsibility to appropriately staff, manage, supervise and direct the Work which is inclusive of the performance, acts, and actions of his personnel and subcontractors. As such, the Contractor further agrees to indemnify and hold harmless the Owner and the Architect/Engineer, and to protect and defend both from and against all claims, attorneys' fees, demands, causes of action of any kind or character, including the cost of defense thereof, arising in favor of or against the Owner, Architect/Engineer, Contractor, their agents, employees, or any third parties on account of the performance, behavior, acts or actions of the Contractor's personnel or subcontractors.

3.9.4. Prior to the commencement of any work, the Contractor shall prepare and submit a personnel listing and organizational chart in a format acceptable to the Owner which lists by name, phone number (including cell phone), job category, and responsibility the Contractor's key/primary personnel who will work on the Project. The Contractor shall promptly inform the Owner in writing of any proposed replacements, the reasons therefore, and the name and qualifications of any proposed replacements. The Owner shall have the right to reject any proposed replacements without cost or claim being made by the Contractor. The chart shall be provided to the Owner at the time of the pre-construction conference.

3.9.5. The Contractor shall immediately remove for the duration of the Project, any person making an inappropriate racial, sexual, or ethnic comment, statement, joke, or gesture toward any other individual.

3.9.6. The Contractor shall immediately remove for the duration of the Project, any person who is incompetent, careless, disruptive, or not working in harmony with others.

### 3.10. **CONSTRUCTION SCHEDULES**

3.10.1. The Contractor shall, promptly after being awarded the Contract, prepare and submit for the Owner's and Architect/Engineer's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and per the requirements of the Contract Documents, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. The Contractor's schedule shall be in the "Critical Path Method" and shall show the Critical Path of the Work in sufficient detail to evaluate the Contractor's progress. A request for time extension by the Contractor will not be allowed unless a change in the Work is approved by the Owner and materially affects the Critical Path. It is the Contractor's responsibility to demonstrate that any time extensions requests materially affect the Critical Path.

- 3.10.2. The Contractor shall prepare and keep current, for the Architect/Engineer's approval, a schedule of submittals which is coordinated with the Contractor's Construction Schedule and allows the Architect/Engineer reasonable time to review submittals.
- 3.10.3. The Contractor shall perform the Work in accordance with the most recent schedule submitted to the Owner and Architect/Engineer.
- 3.10.4. The Contractor's operations (including but not limited to the Contractor's forces employed, sequences of operations, and methods of operation) at all times during the performance of the contract shall be: (a) subject to the review of the Owner or the Architect/Engineer; and, (b) sufficient to insure the completion of the Work within the specified performance period.
- 3.10.5. The Critical Path Method Construction Schedule prepared by the Contractor must be in a form that is acceptable to both the Architect/Engineer and the Owner.
  - 3.10.5.1. The Schedule shall show the estimated progress of the entire Project through the individual time periods allowed for completion of each discipline, trade, phase, section, and aspect of the Work.
  - 3.10.5.2. The Schedule shall show percent complete, progress to date, project work, and projected time to complete the work for all activities. The percent complete and minor schedule changes, including additions of activities, change orders, construction change directives, changes to sequences of activities and significant changes in activity demands must be shown by a revised Schedule. A written report providing details about the changes and what actions are anticipated to get the work completed in the contractual time period shall be submitted with the revised schedule.
  - 3.10.5.3. The Construction Schedule shall include coordinate dates for performance of all divisions of the Work, including shipping and delivery, off-site requirements and tasks, so the Work can be completed in a timely and orderly fashion consistent with the required dates of Substantial Completion and Final Acceptance.
  - 3.10.5.4. The Construction Schedule shall include: (i) the required commencement date, the required dates of Substantial Completion(s) and Final Acceptance for the complete Project and all phases (if any); (ii) any guideline and milestone dates required by the Owner or the Contract Documents; (iii) subcontractor and supplier schedules; (iv) a submittal schedule which allows sufficient time for review and action by the Architect/Engineer; (v) the complete sequence of all construction activities with start and completion dates; and, (vi) required decision dates.
  - 3.10.5.5. By receiving, reviewing, and/or commenting on the Construction Schedule or any portion thereof (including logic and resource loading), neither the Owner or Architect/Engineer assume any of the Contractor's responsibility or liability that the Schedule be coordinated or complete, or for timely and orderly completion of the Work.
  - 3.10.5.6. Receiving, reviewing, and/or commenting on the Schedule, any portion thereof, or any revision thereof, does not constitute an approval, acknowledgement, or acceptance of any duration, dates, milestones, or performance indicated therein.
  - 3.10.5.7. A printout of the Schedule's logic showing all activities is required with the Schedule and with all updates to the Schedule.
- 3.10.6. The Contractor shall review and compare, at a minimum on a weekly basis, the actual status of the Work against its Construction Schedule.
- 3.10.7. The Contractor shall routinely, frequently, and periodically (but not less than monthly) update and/or revise its Construction Schedule to show actual progress of the Work through the date of the update or revision, projected level of completion of each remaining activity, activities modified since the previous update or revision, and major changes in scope or logic. The updated/revised Schedule shall be accompanied by a narrative report which: (1) states and explains any modifications of the critical path, if

any, including any changes in logic; (2) defines problem areas and lists areas of anticipated delays; (3) explains the anticipated impact the change in the critical path or problems and delays will have on the entire Schedule and the completion of the Work; (4) provides corrective action taken or proposed; and, (5) states how problems or delays will be resolved in order to deliver the Work by the required phasing milestones (if any), Substantial Completion(s), and Final Acceptance dates.

- 3.10.8. Delay in Performance: If at any time the Contractor anticipates that performance of the Work will be delayed or has been delayed, the Contractor shall: (1) immediately notify the Architect/Engineer by separate and distinct correspondence of the probable cause and effect of the delay, and possible alternatives to minimize the delay; and, (2) take all corrective action reasonably necessary to deliver the Work by the required dates. Nothing in this paragraph or the Contract Documents shall be construed by the Contractor as a granting by the Architect/Engineer or Owner of constructive acceleration. The results of failure to anticipate delays, or to timely notify the Owner and Architect/Engineer of an anticipated or real delay, are entirely the responsibility of the Contractor whether compensable or not.
- 3.10.9. Early Completion: The Contractor may attempt to achieve Substantial Completion(s) on or before the date(s) required in the Contract. However, such early completion shall be for the Contractor's sole convenience and shall not create any real or implied additional rights to Contractor or impose any additional obligations on the Owner or Architect/Engineer. The Owner will not be liable for nor pay any additional compensation of any kind to the Contractor for achieving Substantial Completion(s) or Final Acceptance prior to the required dates as set forth in the Contract. The Owner will not be liable for nor pay any additional compensation of any kind should there be any cause whatsoever that the Contractor is not able to achieve Substantial Completion(s) earlier than the contractually required dates of Substantial Completion(s) or Final Acceptance.
- 3.10.10. Float in Schedule. Any and all float time in the Contractor's schedule, regardless of the path or activity, shall accrue to the benefit of the Owner and the Work, and not to the Contractor. Float also includes any difference shown between any early completion dates shown on the Contractor's Schedule for any phasing milestone(s), Substantial Completion(s) or Final Acceptance and the dates or durations as required by the Contract Documents.
- 3.10.11. Modification of Required Substantial Completion(s) or Final Acceptance Dates: Modification of the required dates shall be accomplished only by duly authorized, accepted, and approved change orders stating the new date(s) with specificity on the change order form. All rights, duties, and obligations, including but not limited to the Contractor's liability for actual, delay, and/or liquidated damages, shall be determined in relation to the date(s) as modified.

### 3.11. **DOCUMENTATION AND AS-BUILT CONDITIONS AT THE SITE**

- 3.11.1. The Contractor shall maintain at the site for the Owner one record copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and accurately marked to record current field changes and selections made during construction, and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect/Engineer or Owner at any time and shall be delivered to the Architect/Engineer for submittal to the Owner upon completion of the Work.
- 3.11.2. The Owner shall not be required to process final payment until all documentation and data required by the Contract Documents is submitted to and approved by the Architect/Engineer including, but not limited to, the As-Built Drawings. The Owner will not process any final request for payment until the Architect/Engineer has received and verified that the Contractor has performed the requirements pertaining to the as-built drawings.
- 3.11.3. The as-built drawings shall be neatly and clearly marked during construction to record all deviations, variations, changes, and alterations as they occur during construction along with such supplementary notes and details necessary to clearly and accurately represent the as-built condition. The as-built drawings shall be available at all times to the Owner, Architect/Engineer and Architect/Engineer's consultants.

### 3.12. **SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**

3.12.1. Definitions:

3.12.1.1. Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

3.12.1.2. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

3.12.1.3. Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

3.12.2. Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review by the Architect/Engineer is subject to the limitations of Subparagraph 4.2.7. Informational submittals upon which the Architect/Engineer is not expected to take responsive action may be so identified in the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect/Engineer without action.

3.12.3. The Contractor shall review, approve, and submit to the Architect/Engineer, Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents within sixty (60) calendar days of being issued the Notice To Proceed unless noted otherwise and shall do so in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Any and all items submitted by the Contractor which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor, or in the opinion of the Architect/Engineer, have not been reviewed for compliance by the Contractor even if marked as such, may be returned by the Architect/Engineer without action and shall not result in any accusation or claim for delay or cost by the Contractor. Any submittal that, in the opinion of the Architect/Engineer, is incomplete in any area or detail may be rejected and returned to the Contractor. It is the responsibility of and incumbent upon the Contractor to ensure and confirm that all submittals are complete, accurate, and in conformance to the Contract Documents prior to submission.

3.12.4. By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents and guarantees to the Architect/Engineer and Owner that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

3.12.5. The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect/Engineer. Should the Contractor, Subcontractors or Sub-subcontractors install, construct, erect or perform any portion of the Work without approval of any requisite submittal, the Contractor shall bear the costs, responsibility, and delay for removal, replacement, and/or correction of any and all items, material, and /or labor.

3.12.6. The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect/Engineer's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect/Engineer in writing of such deviation at the time of submittal and: (1) the Architect/Engineer has given written approval to the specific deviation as a minor change in the Work; or, (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect/Engineer's approval thereof.

3.12.7. The Contractor shall direct specific attention, in writing or on re-submitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect/Engineer on previous submittals. In the absence of such written notice the Architect/Engineer's approval of a re-submission shall not apply to such revisions.



- 3.12.8. The Contractor shall not be required to provide professional services which constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect/Engineer will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect/Engineer. The Owner and the Architect/Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided the Owner and Architect/Engineer have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this subparagraph, the Architect/Engineer will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents but shall be responsible and held liable for review and verification of all performance or design criteria as required by Paragraph 3.2.
- 3.12.9. Unless noted otherwise in the Contract Documents, the Contractor shall submit to the Architect/Engineer within sixty (60) days from the date of the Notice To Proceed electronic copies of all shop/setting drawings, schedules, cut sheets, products, product data, and samples required for the complete Work. Copies shall be reviewed, marked, stamped and approved on each and every copy by the Contractor prior to submission to the Architect/Engineer or they shall be returned without review or action. The Architect/Engineer shall review with reasonable promptness, making corrections, rejections, or other actions as appropriate. The Architect/Engineer's approval or actions on shop/setting drawings, schedules, cut sheets, products, product data, or samples shall not relieve the Contractor from responsibility for, nor deviating from, the requirements of the plans and specifications. Any deviations from the plans and specifications requested or made by the Contractor shall be brought promptly to the attention of the Architect/Engineer.
- 3.12.10. Cost for Re-Submissions: the Contractor is responsible for ensuring that all shop drawings, product data, samples, and submittals contain all information required by the Contract Documents to allow the Architect/Engineer to take action. The costs and expenses to the Architect/Engineer for making exhaustive reviews of each Shop Drawing, Product Data item, sample, or submittal of the Contractor may be billed by the Architect/Engineer directly to the Contractor or, if otherwise agreed by the Owner in writing, may be reimbursed by the Owner to the Architect/Engineer and deducted from the Contractor's contract via change order by the Owner. The Owner will not be liable to the Architect/Engineer for multiple reviews.

### 3.13. **USE OF SITE**

- 3.13.1. The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.
- 3.13.2. The Contractor shall not damage, endanger, compromise or destroy any part of the Project or the site, including but not limited to work performed by others, monuments, stakes, bench marks, survey points, utilities, existing features or structures. The Contractor shall be fully and exclusively responsible for and bare all costs and delays (including and costs of delay) for any damage, endangerment, compromise, or destruction of any part of the Project or site.

### 3.14. **CUTTING AND PATCHING**

- 3.14.1. The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.
- 3.14.2. The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

### 3.15. **CLEAN UP AND SITE CONTROL**

- 3.15.1. The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract during performance of the Work and at the direction of the Owner or Architect/Engineer. At completion of the Work, the Contractor shall remove from and about the Project waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.
- 3.15.2. If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.

### 3.16. **ACCESS TO WORK**

- 3.16.1. The Contractor shall provide the Owner and Architect/Engineer access to the Work at all times wherever located.

### 3.17. **ROYALTIES, PATENTS AND COPYRIGHTS**

- 3.17.1. The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect/Engineer harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect/Engineer. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect/Engineer.

### 3.18. **INDEMNIFICATION**

- 3.18.1. To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect/Engineer, Architect/Engineer's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Paragraph. The Contractor agrees that it will defend, protect, indemnify and save harmless the State of Montana and the Owner against and from all claims, liabilities, demands, causes of action, judgments (including costs and reasonable attorneys' fees), and losses from any cause whatever (including patent, trademark and copyright infringement) except the Owner's sole or partial negligence. This includes any suits, claims, actions, losses, costs, damages of any kind, including the State and Owner's legal expenses, arising out of, in connection with, or incidental to the Contract, but does not include any such suits, claims, actions, losses, costs or damages which are the result of the negligent acts, actions, losses, costs, or damages which are acts, omissions or misconduct of the Owner if they do not arise out of, depend upon or relate to a negligent act, omission or misconduct of the Contractor in whole or in part.
- 3.18.2. In claims against any person or entity indemnified under this Paragraph 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts

they may be liable, the indemnification obligation under Subparagraph 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

#### **ARTICLE 4 – ADMINISTRATION OF THE CONSTRUCTION CONTRACT**

##### **4.1. THE ARCHITECT/ENGINEER**

- 4.1.1. The Architect/Engineer is the person lawfully licensed to practice or an entity lawfully practicing identified as such in the Agreement with the Owner and is referred to throughout the Contract Documents as if singular in number. The term "Architect/Engineer" means the Architect/Engineer's duly authorized representative.
- 4.1.2. Duties, responsibilities and limitations of authority of the Architect/Engineer as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner.
- 4.1.3. If the employment of the Architect/Engineer is terminated, the Owner shall employ a new Architect/Engineer at the sole choice and discretion of the Owner, whose status under the Contract Documents shall be that of the former Architect/Engineer.

##### **4.2. ARCHITECT/ENGINEER'S ADMINISTRATION OF THE CONSTRUCTION CONTRACT**

- 4.2.1. The Architect/Engineer will provide administration of the Contract as described in the Contract Documents, and will be an Owner's representative throughout the complete duration of the Project, including the warranty period. The Architect/Engineer will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified in writing in accordance with the Architect/Engineer Contract.
- 4.2.2. The Architect/Engineer, as a representative of the Owner, will visit the site at intervals appropriate to the stage of the Contractor's operations to: (1) become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed; (2) endeavor to guard the Owner against defects and deficiencies in the Work; and, (3) to determine in general if the Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Owner and Architect/Engineer will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Contractor's Work. The Owner and Architect/Engineer will neither have control over or charge of, nor be responsible for, the construction means, methods, techniques, sequences or procedures, for the safety of any person involved in the work, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.
- 4.2.3. The Architect/Engineer will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect/Engineer will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.
- 4.2.4. Communications Facilitating Contract Administration. Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect/Engineer about matters arising out of or relating to the Contract. Communications by and with the Architect/Engineer's consultants shall be through the Architect/Engineer. Communications by and with Subcontractors and material suppliers shall be through the Contractor to the Architect/Engineer. Communications by and with separate contractors shall be through the Owner to the Architect/Engineer.
- 4.2.5. Based on the Architect/Engineer's evaluations of the Contractor's Applications for Payment, the Architect/Engineer will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts. The Contractor is fully aware that the Owner (i.e. the State of Montana) has established a billing cycle for processing payments in Article 9 of these General Conditions. The Contractor and all Subcontractors are subject to all provisions of Title 28, Chapter 2, Part 21 MCA regarding all aspects of the Work.

- 4.2.6. The Architect/Engineer will have authority to reject Work that does not conform to the Contract Documents. Whenever the Architect/Engineer considers it necessary or advisable, the Architect/Engineer will have authority to require inspection or testing of the Work in accordance with the General Conditions and any applicable technical specification requirements, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect/Engineer nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect/Engineer to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.
- 4.2.7. The Architect/Engineer will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect/Engineer's action will be taken with such reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor or separate contractors, while allowing sufficient time in the Architect/Engineer's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect/Engineer's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Paragraphs 3.3, 3.5 and 3.12. The Architect/Engineer's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect/Engineer, of any construction means, methods, techniques, sequences or procedures. The Architect/Engineer's approval of a specific item shall not indicate approval of an assembly of which the item is a component.
- 4.2.8. The Architect/Engineer will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Paragraph 7.4.
- 4.2.9. The Architect/Engineer will conduct inspections to determine the date or dates of Substantial Completion(s) and the date of Final Acceptance, will receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment upon compliance with the requirements of the Contract Documents.
- 4.2.10. If the Owner and Architect/Engineer agree, the Architect/Engineer will provide one or more project representatives to assist in carrying out the Architect/Engineer's responsibilities. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in the Owner's Agreement with the Architect/Engineer.
- 4.2.11. The Architect/Engineer will interpret and decide matters concerning performance under and requirements of the Contract Documents on written request of either the Owner or Contractor. The Architect/Engineer's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretations required of the Architect/Engineer shall be furnished in compliance with this Paragraph 4.2, then delay shall not be recognized on account of failure by the Architect/Engineer to furnish such interpretations until 15 days after written request is made for them.
- 4.2.12. Interpretations and decisions of the Architect/Engineer will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and initial decisions, the Architect/Engineer will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will render such interpretations and decisions in good faith.
- 4.2.13. The Architect/Engineer's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.
- 4.2.14. The Architect/Engineer's or Owner's observations or inspections do not alleviate any responsibility on the part of the Contractor. The Architect/Engineer and the Owner reserves the right to observe and inspection

the work and make comment. Action or lack of action following observation or inspection is not to be construed as approval of Contractor's performance.

#### 4.3. **CLAIMS AND DISPUTES**

4.3.1. Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extensions of time or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes, controversies, and matters in question between the Owner and Contractor arising out of or relating to the Contract. Claims must be initiated by written notice. The responsibility to substantiate Claims shall rest solely with the party making the Claim.

4.3.1.1. Time Limits on Claims. Claims by either party must be initiated within 21 calendar days after occurrence of the event giving rise to such claim. The following shall apply to the initiation of a claim:

4.3.1.1.1. A written notice of a claim must be provided to the Architect/Engineer and the other party within 21 calendar days after the occurrence of the event or the claim is waived by the claiming party and void in its entirety.

4.3.1.1.2. Claims must be initiated by separate, clear, and distinct written notice within the 21 calendar day time frame to the Architect/Engineer and the other party and must contain the notarized statement in Sub-Paragraph 4.3.1.5 when the claim is made by the Contractor. Discussions in any form with the Architect/Engineer or Owner, whether at the site or not, do not constitute initiation of a claim. Notes in project meeting minutes, email correspondence, change order proposals, or any other form of documentation does not constitute initiation of a claim. The written notice must be a separate and distinct correspondence provided in hardcopy to both the Architect/Engineer and Owner and must delineate the specific event and outline the causes and reasons for the claim whether or not cost or time have been fully determined. Written remarks or notes of a generic nature are invalid in their entirety. Comments made at progress meetings, project site visits, inspections, emails, voice mails, and other such communications do not meet the requirement of providing notice of claim.

4.3.1.1.3. Physical Injury or Physical Damage. Should the Owner or Contractor suffer physical injury or physical damage to person or property because of any error, omission, or act of the other party or others for whose acts the other party is legally and contractually liable, claim will be made in writing to the other party within a reasonable time of the first observance of such physical injury or physical damage but in no case beyond 30 calendar days of the first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. The provisions of this paragraph shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose. In all such cases, the indemnification provisions of the Contract shall be effectual and the Contractor's insurance shall be primary and in full effect.

4.3.1.2. All Claims must contain sufficient justification and substantiation with the written notice or they may be rejected without consideration by the Architect/Engineer or other party with no additional impact or consequence to the Contract Sum, Contract Time, or matter(s) in question in the Claim.

4.3.1.3. If additional compensation is claimed, the exact amount claimed and a breakdown of that amount into the following categories shall be provided with each and every claim:

4.3.1.3.1. Direct costs (as listed in Subparagraph 7.3.9.1 through 7.3.9.5);

4.3.1.3.2. Indirect costs (as defined in Paragraph 7.2.5); and,

4.3.1.3.3. Consequential items (i.e. time extensions, credits, logic, reasonableness, impacts, disruptions, dilution) for the change.

4.3.1.4. If additional time is claimed the following shall be provided with each and every claim:

- 4.3.1.4.1. The specific number of days and specific dates for which the additional time is sought;
- 4.3.1.4.2. The specific reasons, causes, and/or effects whereby the Contractor believes that additional time should be granted; and,
- 4.3.1.4.3. The Contractor shall provide analyses, documentation, and justification of its claim for additional time in accordance with the latest Critical Path Method schedule in use at the time of event giving rise to the claim.

4.3.1.5. With each and every claim, the Contractor shall submit to the Architect/Engineer and Owner a notarized statement containing the following language:

"Under penalty of law (including perjury and/or false/fraudulent claims against the State), the undersigned,

(Name)	(Title)
Of (Company)	(Date)

hereby certifies, warrants, and guarantees that this claim made for Work on this Contract is a true statement of the costs, adjustments and/or time sought and is fully documented and supported under the contract between the parties.

(Signature)	(Date)"
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4.3.2. Continuing Contract Performance.

4.3.2.1. Pending final resolution of a Claim except as otherwise agreed in writing or as provided in Subparagraph 9.7.1 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents on the portion of the Work not involved in a Claim.

4.3.3. Claims for Cost or Time for Concealed or Unknown Conditions.

4.3.3.1. If conditions are encountered at the site which are: (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents; or, (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed.

4.3.3.2. The Architect/Engineer will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect/Engineer determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect/Engineer shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within 21 days after the date of the Architect/Engineer's decision.

4.3.3.3. If the conditions encountered are materially different, the Contract Sum and Contract Time shall be equitably adjusted, but if the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Architect/Engineer for initial determination, subject to further proceedings pursuant to Paragraph 4.4.

4.3.3.4. Nothing in this paragraph shall relieve the Contractor of its obligation to adequately and sufficiently investigate, research, and examine the site, the site survey, topographical

information, and the geotechnical information available whether included by reference or fully incorporated in the Contract Documents.

#### 4.3.4. Claims for Additional Cost.

4.3.4.1. If the Contractor wishes to make Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Paragraph 10.6.

4.3.4.2. If the Contractor believes additional cost is involved for reasons including but not limited to: (1) a written interpretation from the Architect/Engineer; (2) an order by the Owner to stop the Work solely for the Owner's convenience or where the Contractor was not at least partially at fault; (3) a written order for a minor change in the Work issued by the Architect/Engineer; (4) failure of payment by the Owner per the terms of the Contract; (5) termination of the Contract by the Owner; or, (6) other reasonable grounds, Claim must be filed in accordance with this Paragraph 4.3.

#### 4.3.5. Claims for Additional Time

4.3.5.1. If the Contractor wishes to make Claim for an increase in the Contract Time, written notice as specified in these General Conditions shall be provided along with the notarized certification. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay for the same event or cause only one Claim is necessary. However, separate and distinct written notice is required for each separate event.

#### 4.3.5.2. Weather Delays:

4.3.5.2.1. If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction activities.

4.3.5.2.2. Inclement or adverse weather shall not be a prima facie reason for the granting of an extension of time, and the Contractor shall make every effort to continue work under prevailing conditions. The Owner may grant an extension of time if an unavoidable delay occurs as a result of inclement/severe/adverse weather and such shall then be classified as a "Delay Day". Any and all delay days granted by the Owner are and shall be non-compensable in any manner or form. The Contractor shall comply with the notice requirements concerning instances of inclement/severe/adverse weather before the Owner will consider a time extension. Each day of inclement/severe/adverse weather shall be considered a separate instance or event and as such, shall be subject to the notice requirements.

4.3.5.2.3. An "inclement", "severe", or "adverse" weather delay day is defined as a day on which the Contractor is prevented by weather or conditions caused by weather resulting immediately there from, which directly impact the current controlling critical-path operation or operations, and which prevent the Contractor from proceeding with at least 75% of the normal labor and equipment force engaged on such critical path operation or operations for at least 60% of the total daily time being currently spent on the controlling operation or operations.

4.3.5.2.4. The Contractor shall consider normal/typical/seasonal weather days and conditions caused by normal/typical/seasonal weather days for the location of the Work in the planning and scheduling of the Work to ensure completion within the Contract Time. No time extensions will be granted for the Contractor's failure to consider and account for such weather days and conditions caused by such weather for the Contract Time in which the Work is to be accomplished.

4.3.5.2.5. A "normal", "typical", or "seasonal" weather day shall be defined as weather that can be reasonably anticipated to occur at the location of the Work for each particular month involved in the Contract Time. Each month involved shall not be

considered individually as it relates to claims for additional time due to inclement/adverse/severe weather but shall consider the entire Contract Time as it compares to normal/typical/seasonal weather that is reasonably anticipated to occur. Normal/typical/seasonal weather days shall be based upon U.S. National Weather Service climatic data for the location of the Work or the nearest location where such data is available.

4.3.5.2.6. The Contractor is solely responsible to document, prepare and present all data and justification for claiming a weather delay day. Any and all claims for weather delay days shall be tied directly to the current critical-path operation or operations on the day of the instance or event which shall be delineated and described on the Critical-Path Schedule and shall be provided with any and all claims. The Contractor is solely responsible to indicate and document why the weather delay day(s) claimed are beyond those weather days which are reasonably anticipated to occur for the Contract Time. Incomplete or inaccurate claims, as determined by the Architect/Engineer or Owner, may be returned without consideration or comment.

4.3.5.3. Where the Contractor is prevented from completing any part of the Work with specified durations or phases due to delay beyond the control of both the Owner and the Contractor, an extension of the contract time or phase duration in an equal amount to the time lost due to such delay shall be the Contractor's sole and exclusive remedy for such delay.

4.3.5.4. Delays attributable to and/or within the control of subcontractors and suppliers are deemed to be within the control of the Contractor.

4.3.5.5. In no event shall the Owner be liable to the Contractor, any subcontractor, any supplier, Contractor's surety, or any other person or organization, for damages or costs arising out of or resulting from: (1) delays caused by or within the control of the Contractor which include but are not limited to labor issues or labor strikes on the Project, federal, state, or local jurisdiction enforcement actions related directly to the Contractor's Work (e.g. safety or code violations, etc.); or, (2) delays beyond the control of both parties including but not limited to fires, floods, earthquakes, abnormal weather conditions, acts of God, nationwide material shortages, actions or inaction by utility owners, emergency declarations by federal, state, or local officials enacted in the immediate vicinity of the project, or other contractors performing work for the Owner.

#### 4.3.6. Claims for Consequential Damages

4.3.6.1. The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes:

4.3.6.1.1. damages incurred by the Owner for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and,

4.3.6.1.2. damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, income, and for loss of profit.

4.3.6.2. This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this waiver of consequential damages shall be deemed to preclude an award of liquidated or actual damages, when applicable, in accordance with the requirements of the Contract Documents.

#### 4.4. **RESOLUTION OF CLAIMS, DISPUTES, AND CONTROVERSIES**

4.4.1. Decision of Architect/Engineer. Claims, including those alleging an error or omission by the Architect/Engineer, shall be referred initially to the Architect/Engineer for decision. A decision by the Architect/Engineer shall be required as a condition precedent to mediation, arbitration or litigation of all Claims between the Contractor and Owner arising prior to the date of Final Acceptance, unless 30 days have passed after the Claim has been referred to the Architect/Engineer with no decision having been rendered by the Architect/Engineer. The Architect/Engineer will not decide disputes between the



Contractor and persons or entities other than the Owner. Any Claim arising out of or related to the Contract, except those already waived in Subparagraphs 4.3.6, 7.2.6, 7.3.8, 9.10.4 and 9.10.5 shall, pending compliance with Subparagraph 4.4.5, be subject to mediation, arbitration, or the institution of legal or equitable proceedings. Claims waived in Subparagraphs 4.3.6, 7.2.6, 7.3.8, 9.10.4, and 9.10.5 are deemed settled, resolved, and completed.

- 4.4.2. The Architect/Engineer will review Claims and within ten (10) days of the receipt of the Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party; (2) reject the Claim in whole or in part; (3) approve the Claim; (4) suggest a compromise; or (5) advise the parties that the Architect/Engineer is unable to resolve the Claim if the Architect/Engineer lacks sufficient information to evaluate the merits of the Claim or if the Architect/Engineer concludes that, in the Architect/Engineer's sole discretion, it would be inappropriate for the Architect/Engineer to resolve the Claim.
- 4.4.3. If the Architect/Engineer requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond within ten (10) days after receipt of such request and shall either provide a response on the requested supporting data, advise the Architect/Engineer when the response or supporting data will be furnished, or advise the Architect/Engineer that no supporting data will be furnished. Upon either no response or receipt of the response or supporting data, the Architect/Engineer will either reject or approve the Claim in whole or in part.
- 4.4.4. The Architect/Engineer will approve or reject Claims by written decision, which shall state the reasons therefore and which shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Architect/Engineer shall be final and binding on the parties but subject to mediation and arbitration.
- 4.4.5. When 30 days have passed upon submission of a Claim without decision or action by the Architect/Engineer, or the Architect/Engineer has rendered a decision or taken any of the actions identified in Subparagraph 4.4.2, a demand for arbitration of a Claim covered by such decision or action must be made within 30 days after the date of expiration of Subparagraph 4.4.1 or within 30 days of the Architect/Engineer's decision or action. Failure to demand arbitration within said 30 day period shall result in the Architect/Engineer's decision becoming final and binding upon the Owner and Contractor whenever such decision is rendered.
- 4.4.6. If the Architect/Engineer renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence but shall not supersede arbitration proceedings unless the decision is acceptable to all parties concerned.
- 4.4.7. Upon receipt of a Claim against the Contractor or at any time thereafter, the Architect/Engineer or the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Architect/Engineer or the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.
- 4.4.8. A Claim subject to or related to liens or bonds shall be governed by applicable law regarding notices, filing deadlines, and resolution of such Claim prior to any resolution of such Claim by the Architect/Engineer, by mediation, or by arbitration, except for claims made by the Owner against the Contractor's bonds.

#### 4.5. **MEDIATION**

- 4.5.1. Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Subparagraphs 4.3.6, 7.2.6, 7.3.8, 9.10.4 and 9.10.5 shall, after initial decision by the Architect/Engineer or 30 days after submission of the Claim to the Architect/Engineer, be subject to mediation as a condition precedent to arbitration or the institution of legal or equitable proceedings by either party.
- 4.5.2. The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Mediation Rules of the American Arbitration Association currently in effect and/or those rules specified in the contract documents or separately agreed upon between the parties. Construction Industry Mediation Rule M-2 (filing with AAA)

is void. The parties shall mutually agree upon a mediator who shall then take the place of AAA in the Construction Industry Mediation Rules. The parties must mutually agree to use AAA and no filing of a request for mediation shall be made to AAA by either party until such mutual agreement has been made. Request for mediation shall be filed in writing with the other party to the Contract and with the American Arbitration Association. The request may be made concurrently with the filing of a demand for arbitration but, in such event, mediation shall proceed in advance of arbitration or legal or equitable proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order.

4.5.3. The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

#### 4.6. **ARBITRATION**

4.6.1. Any controversy or Claim arising out of or related to this Contract or the breach thereof shall be settled by arbitration in accordance with the Montana Uniform Arbitration Act (MUAA). To the extent it does not conflict with the MUAA, the Construction Industry Arbitration Rules of the American Arbitration Association shall apply except as modified herein. The parties to the arbitration shall bear their own costs and expenses for participating in the arbitration. Costs of the Arbitration panel shall be borne equally between the parties except those costs awarded by the Arbitration panel (including costs for the arbitration itself).

4.6.2. Prior to the arbitration hearing all parties to the arbitration may conduct discovery subject to the provisions of Montana Rules of Civil Procedure. The arbitration panel may award actual damages incurred if a party fails to provide full disclosure under any discovery request. If a party claims a right of information privilege protected by law, the party must submit that claim to the arbitration panel for a ruling, before failing to provide information requested under discovery or the arbitration panel may award actual damages.

4.6.3. The venue for all arbitration proceedings required by this Contract shall be the seat of the county in which the work occurs or the First Judicial District, Lewis & Clack County, as determined solely by the Owner. Arbitration shall be conducted by a panel comprised of three members with one selected by the Contractor, one selected by the Owner, and one selected by mutual agreement of the Owner and the Contractor.

4.6.4. Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Subparagraphs 4.3.6, 7.2.6, 7.3.8, 9.10.4 and 9.10.5, shall, after decision or action by the Architect/Engineer or 30 days after submission of the Claim to the Architect/Engineer, be subject to arbitration provided a demand for arbitration is made within the time frame provided in Subparagraph 4.4.5. If such demand is not made with the specified time frame, the Architect/Engineer's decision or action is final. Prior to arbitration, the parties shall endeavor to resolve disputes by mediation in accordance with the provisions of Paragraph 4.5.

4.6.5. Claims not resolved by mediation shall be decided by arbitration which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect and/or those rules specified in the Contract Documents or separately agreed upon between the parties. Construction Industry Arbitration Rule R-3 (filing with AAA) is void. The parties shall mutually agree upon an arbitrator or arbitrators who shall then take the place of AAA in the Construction Industry Arbitration Rules. The parties must mutually agree to use AAA and no filing of a demand for arbitration shall be made to AAA by either party until such mutual agreement has been made. The demand for arbitration shall be filed in writing with the other party to the Contract and a copy shall be filed with the Architect/Engineer.

4.6.6. A demand for arbitration shall be made within the time limits specified in Subparagraphs 4.4.5 and in no event shall it be made after the date when institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations as determined pursuant to Paragraph 13.7.

4.6.7. Pending final resolution of a Claim including arbitration, unless otherwise mutually agreed in writing, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract on Work or amounts not in dispute.

- 4.6.8. **Limitation on Consolidation or Joinder.** Arbitration arising out of or relating to the Contract may include by consolidation or joinder the Architect/Engineer, the Architect/Engineer's employees or consultants, except by written consent containing specific reference to the Agreement and signed by the Architect/Engineer, Owner, Contractor and any other person or entity sought to be joined. No arbitration shall include, by consolidation or joinder or in any other manner, parties other than the Owner, Architect/Engineer, Contractor, a separate contractor as described in Article 6 and other persons substantially involved in a common question of fact or law whose presence is required if complete relief is to be accorded in arbitration. No person or entity other than the Owner, Architect/Engineer, Contractor or a separate contractor as described in Article 6 shall be included as an original third party or additional third party to an arbitration whose interest or responsibility is insubstantial. The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.
- 4.6.9. **Claims and Timely Assertion of Claims.** The party filing a demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.
- 4.6.10. **Judgment on Final Award.** The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof. The parties agree that the costs of the arbitrator(s)' compensation and expenses shall be borne equally. The parties further agree that the arbitrator(s) shall have authority to award to either party some or all of the costs and expenses involved, including attorney's fees.

## **ARTICLE 5 – SUBCONTRACTORS**

### **5.1. DEFINITIONS**

- 5.1.1. A Subcontractor is a person or entity who has a direct or indirect contract at any tier or level with the Contractor or any Subcontractor to the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

### **5.2. AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK**

- 5.2.1. Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract and in no instance later than (30) days after award of the Contract, shall furnish in writing to the Owner through the Architect/Engineer the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect/Engineer will promptly reply to the Contractor in writing stating whether or not the Owner or the Architect/Engineer, after due investigation, has reasonable objection to any such proposed person or entity.
- 5.2.2. The Contractor shall not contract with a proposed person or entity to which the Owner or Architect/Engineer has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.
- 5.2.3. If the Owner or Architect/Engineer has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect/Engineer has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.
- 5.2.4. The Contractor shall not change a Subcontractor, person or entity previously selected if the Owner or Architect/Engineer makes reasonable objection to such substitute. The Contractor shall not change or

substitute for a Subcontractor who was required to be listed on the bid without first getting the approval of the Owner.

- 5.2.5. Buy-Safe Montana Provision: Before commencement of each subcontractor's portion of the Work, the Contractor shall obtain each subcontractor's incidence rate, experience modification rate, and loss ratio. The Contractor shall endeavor--but is not required--to use subcontractors whose incidence rate is less than the latest average for non-residential building construction for Montana as established by the Federal Bureau of Labor Statistics for the prior year; whose experience modification rating (EMR) is less than 1.0; and whose loss ratio is less than 100%. Contractor shall require any of its subcontractors who, based on the safety information that the Contractor obtains, have greater-than-average incidence rate, an EMR greater than 1.0, and a loss ratio of more than 100%, to schedule and obtain a Comprehensive Safety Consultation from the Montana Department of Labor & Industry, Employment Relations Division, Safety Bureau before substantial completion of each such subcontractor's portion of the Work. For assistance in obtaining the Comprehensive Safety Consultation, visit <http://erd.dli.mt.gov/safety-health/onsite-consultation>.

### 5.3. **SUBCONTRACTUAL RELATIONS**

- 5.3.1. By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect/Engineer. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect/Engineer under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement which may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.
- 5.3.2. Upon written request by the Owner, the Contractor shall require its subcontractors to provide to it performance and payment securities for their portion of the Work in the types and form defined in statute (18-2-201 and 18-2-203 MCA) for all sub-contractual agreements.
- 5.3.3. The Contractor shall prepare a Subcontractors' and Suppliers' chart in CSI division format acceptable to the Owner which lists by name, all contact information, job category, and responsibility the Contractor's Subcontractors (at all tiers or levels) and Suppliers with a pecuniary interest in the Project of greater than \$5,000.00. The Contractor shall not enter into any agreement with any subcontractor or supplier to which the Owner raises a timely objection. The Contractor shall promptly inform the Owner in writing of any proposed replacements, the reasons therefore, and the name and qualifications of any proposed replacements. The Owner shall have the right to reject any proposed replacements without cost or claim being made by the Contractor. The chart shall be provided to the Owner at the time of the pre-construction conference but no less than 30 days after award of the Contract.
- 5.3.4. All Contractors and Subcontractors to this contract must comply with all Montana Department of Labor and Industry requirements, regulations, rules, and statutes.
- 5.3.5. In accordance with 39-51-1104 MCA, any Contractor who is or becomes an employer under the provisions of Title 39, Chapter 51 of Montana Code Annotated, who contracts with any Subcontractor who also is or becomes an employer under the provisions of Title 39, Chapter 51 of Montana Code Annotated, shall withhold sufficient money on the contract to guarantee that all taxes, penalties, and interest are paid upon completion of the contract.

5.3.5.1. It is the duty of any Subcontractor who is or becomes an employer under the provisions of Title 39, Chapter 51 of Montana Code Annotated, to furnish the Contractor with a certification issued by the Montana Department of Labor and Industry, prior to final payment stating that said Subcontractor is current and in full compliance with the provisions of Montana Department of Labor and Industry.

5.3.5.2. Failure to comply shall render the Contractor directly liable for all taxes, penalties, and interest due from the Subcontractor, and the Montana Department of Labor and Industry has all of the remedies of collection against the Contractor under the provisions of Title 39, Chapter 51 of Montana Code Annotated, as though the services in question were performed directly for the Contractor.

5.3.6. In compliance with state statutes (15-50-206 MCA), the Contractor will have the 1% Gross Receipts Tax withheld from all payments. Each "Public Contractor" includes all Subcontractors with contracts greater than \$80,000 each. The Contractor and all Subcontractors will withhold said 1% from payments made to all Subcontractors with contracts greater than \$80,000.00 and make it payable to the Montana Department of Revenue. The Contractor and all Subcontractors shall also submit documentation of all contracts greater than \$80,000.00 to the Montana Department of Revenue on the Department's prescribed form.

5.3.7. Construction Contractor Registration: All Subcontractors at any tier or level are required to be registered with the Department of Labor and Industry under 39-9-201 and 39-9-204 MCA prior to the Contract being executed by the Owner. Subcontractors shall demonstrate to the Contractor that it has registered or promises that it will register immediately upon notice of award and prior to the commencement of any work.

#### 5.4. **CONTINGENT ASSIGNMENT OF SUBCONTRACTS**

5.4.1. Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that:

5.4.1.1. assignment is effective only after termination of the Contract by the Owner for cause pursuant to Paragraph 14.2 and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor and Contractor in writing; and,

5.4.1.2. assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

5.4.2. Upon such assignment, if the Work has been suspended for more than 30 days as a result of the Contractor's default, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension. Such adjustment shall be at the expense of the Contractor.

5.4.3. The Contractor shall engage each of its subcontractors and suppliers with written contracts that preserve and protect the rights of the Owner and include the acknowledgement and agreement of each subcontractor and supplier that the Owner is a third-party beneficiary of their sub-contractual and supplier agreements. The Contractor's agreements shall require that in the event of default by the Contractor or termination of the Contractor, and upon request of the Owner, the Contractor's subcontractors and suppliers will perform services for the Owner.

5.4.4. Construction Contractor Registration: All Subcontractors at any tier or level are required to be registered with the Department of Labor and Industry under 39-9-201 and 39-9-204 MCA prior to the Contract being executed by the Owner. Subcontractors shall demonstrate to the Contractor that it has registered or promises that it will register immediately upon notice of award and prior to the commencement of any work.

### **ARTICLE 6 – CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**

#### 6.1. **OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS**

- 6.1.1. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Paragraph 4.3.
- 6.1.2. When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.
- 6.1.3. The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.
- 6.1.4. Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights which apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

## 6.2. **MUTUAL RESPONSIBILITY**

- 6.2.1. The Contractor shall afford the Owner and separate contractors reasonable opportunity' for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.
- 6.2.2. If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect/Engineer apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.
- 6.2.3. The Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a separate contractor because of delays, improperly timed activities or defective construction of the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work or defective construction of a separate contractor.
- 6.2.4. The Contractor shall promptly remedy damage wrongfully caused by the Contractor to completed or partially completed construction or to property of the Owner or separate contractors as provided in Paragraph 12.2.
- 6.2.5. The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Subparagraph 3.14.

## 6.3. **OWNER'S RIGHT TO CLEAN UP**

- 6.3.1. If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect/Engineer will determine the responsibility of those involved and allocate the cost accordingly.

## **ARTICLE 7 – CHANGES IN THE WORK**

### **7.1. GENERAL**

- 7.1.1. Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive, or order for a minor change in the Work subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. Minor changes as ordered by the Architect/Engineer has the definition provided in Paragraph 7.4
- 7.1.2. A Change Order shall be based upon agreement among the Owner, Contractor, and Architect/Engineer; a Construction Change Directive requires agreement by the Owner and Architect/Engineer and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect/Engineer alone.
- 7.1.3. Changes in the Work shall be performed under applicable provisions of the Contract Documents and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.
- 7.1.4. No act, omission, or course of dealing, shall alter the requirement that Change Orders or Construction Change Directives shall be in writing and signed by the Owner, and that Change Orders and Construction Change Directives are the exclusive method for effecting any adjustment to the Contract. The Contractor understands and agrees that neither the Contract Sum nor the Contract Time can be changed by implication, oral agreement, verbal directive, or unsigned Change Order.

### **7.2. CHANGE ORDERS**

- 7.2.1. A Change Order is a written instrument prepared by the Architect/Engineer and signed by the Owner, Contractor and Architect/Engineer, stating their agreement upon all of the following:
  - 7.2.1.1. change in the Work;
  - 7.2.1.2. the amount of the adjustment, if any, in the Contract Sum; and,
  - 7.2.1.3. the extent of the adjustment, if any, in the Contract Time.
- 7.2.2. The cost or credit to the Owner resulting from a change in the Work shall be determined as follows:
  - 7.2.2.1. Per the limitations of this Subparagraph, plus a 5% allowance for overhead and a 10% allowance for profit. The allowances for overhead and for profit are limited to the percentages as specified herein unless they are determined to be unreasonable by the Architect/Engineer (not the Contractor) per Subparagraph 7.3.9 for each Change Order or Construction Change Directive; or,
  - 7.2.2.2. By one of the methods in Subparagraph 7.3.4, or as determined by the Architect/Engineer per Subparagraph 7.3.9, plus a 5% allowance for overhead and a 10% allowance for profit. The allowances for overhead and for profit are limited to the percentages as specified herein unless they are determined to be unreasonable by the Architect/Engineer (not the Contractor) per Subparagraph 7.3.9 for each Change Order or Construction Change Directive.
  - 7.2.2.3. The Contractor's proposed increase or decrease in cost shall be limited to costs listed in Subparagraph 7.3.9.1 through 7.3.9.5.
- 7.2.3. The Contractor shall not submit any Change Order, response to requested cost proposals, or requested changes which are incomplete and do not contain full breakdown and supporting documentation in the following three areas:
  - 7.2.3.1. Direct costs (only those listed in Subparagraph 7.3.9.1 through 7.3.9.5 are allowable);
  - 7.2.3.2. Indirect costs (limited as a percentage on each Change Order per Paragraph 7.2.2); and

7.2.3.3. Consequential items (e.g. time extensions, credits, logic, reasonableness, impacts, disruptions, dilution).

7.2.4. Any Change Order, responses to requested proposals, or requested changes submitted by the Contractor which, in the opinion of the Architect/Engineer, are incomplete, may be rejected and returned to the Contractor without comment. It is the responsibility of and incumbent upon the Contractor to ensure and confirm that all Change Orders, responses to requested proposals, or requested changes are complete prior to submission.

7.2.5. Overhead, applicable to all areas and sections of the Contract Documents, means "Indirect Costs" as referenced in Subparagraph 7.2.3.2. Indirect costs are inclusive of, but not limited to, the following: home office overhead; off-site supervision; home office project management; change order and/or proposal preparation, design, research, negotiation and associated travel; effects of disruption and dilution of management and supervision off-site; time delays; coordination of trades; postage and shipping; and, effective increase in guarantee and warranty durations. Indirect costs applicable to any and all changes in the work, either through Change Order or Construction Change Directive, are limited to the percentage allowance for overhead in Subparagraph 7.2.2.

7.2.6. By signature on any Change Order, the Contractor certifies that the signed Change Order is complete and includes all direct costs, indirect costs and consequential items (including additional time, if any) and is free and clear of all claims or disputes (including, but not limited to, claims for additional costs, additional time, disruptions, and/or impacts) in favor of the Contractor, subcontractors, material suppliers, or other persons or entities concerning the signed change order and on all previously contracted Work and does release the Owner from such claims or demands.

7.2.7. Any and all changes or adjustments to the Contract Time requested or claimed by the Contractor as a result of a Change Order shall require documentation and justification for the adjustment by a Critical Path Method analysis of the Contractor's most recent Critical Path Schedule in use prior to the change. Changes which affect or concern activities containing float or slack time (i.e. not on the critical path) and which can be accomplished within such float or slack time, shall not result in an increase in the Contract Time.

7.2.8. Supervision means on-site, field supervision and not home office overhead, off-site management or off-site supervision.

7.2.9. Labor means those persons engaged in construction occupations as defined in Montana Prevailing Wage Rates for Building Construction or Heavy/Highway as bound in the Contract Documents and does not include design, engineering, superintendence, management, on-site field supervision, home office or other off-site management, off-site supervision, office or clerical work.

### 7.3. **CONSTRUCTION CHANGE DIRECTIVES**

7.3.1. A Construction Change Directive is a written order prepared by the Architect/Engineer directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

7.3.2. Any and all changes or adjustments to the Contract Time requested or claimed by the Contractor as a result of a Construction Change Directive, shall require documentation and justification for the adjustment by a Critical Path Method analysis of the Contractor's most recent Critical Path Schedule in use prior to the change. Changes that affect or concern activities containing float or slack time (i.e. not on the critical path) and which can be accomplished within such float or slack time shall not result in an increase in the Contract Time.

7.3.3. A Construction Change Directive shall be used in the absence of agreement on the terms of a Change Order.

7.3.4. If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:



- 7.3.4.1. mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
  - 7.3.4.2. unit prices stated in the Contract Documents or subsequently agreed upon;
  - 7.3.4.3. cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee;
  - 7.3.4.4. By actual cost as shown by the Contractor's and Subcontractor's itemized invoices; or
  - 7.3.4.5. as provided in Subparagraph 7.3.9.
- 7.3.5. Costs shall be limited to the following: cost of materials, including cost of delivery; cost of labor, including social security, old age and unemployment insurance and fringe benefits under collective bargaining agreements; workers' compensation insurance; bond premiums; and rental value of power tools and equipment.
- 7.3.6. Overhead and profit allowances shall be limited on all Construction Change Directives to those identified in 7.2.2.
- 7.3.7. Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect/Engineer of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.
- 7.3.8. A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.
- 7.3.9. If the Contractor does not respond or disagrees with the method for adjustment in the Contract Sum in writing within seven (7) calendar days, the method and the adjustment made shall be determined by the Architect/Engineer on the basis of reasonable expenditures and/or savings of those performing the Work directly attributable to the change including, in the case of an increase in the Contract Sum, plus an allowance for overhead and profit as listed under Subparagraph 7.2.2. In such case, and also under Clause 7.3.4.3, the Contractor shall keep and present, in such form as the Architect/Engineer may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Subparagraph 7.3.9 shall be limited to the following:
- 7.3.9.1. costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance as determined by the Prevailing Wage Schedules referenced in the Contract Documents;
  - 7.3.9.2. costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
  - 7.3.9.3. rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
  - 7.3.9.4. costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
  - 7.3.9.5. additional costs of field supervision and field office personnel directly attributable to the change.
- 7.3.10. The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect/Engineer plus markups in subparagraph 7.2.2. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net change, if any, with respect to that change.

- 7.3.11. Pending final determination of the total cost of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs. For any portion of such cost that remains in dispute, the Architect/Engineer will make an interim determination for purposes of monthly certification for payment for those costs. That determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a claim in accordance with Article 4.
- 7.3.12. When the Owner and Contractor agree with the determination made by the Architect/Engineer concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and shall be recorded by preparation and execution of an appropriate Change Order.

#### 7.4. **MINOR CHANGES IN THE WORK**

- 7.4.1. The Architect/Engineer will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

### **ARTICLE 8 – TIME**

#### 8.1. **DEFINITIONS**

- 8.1.1. Time is of the essence in performance, coordination, and completion of the Work contemplated herein. The Owner may suffer damages if the Work is not completed as specified herein. When any duration or time period is referred to in the Contract Documents by days, the first day shall be determined as the day following the current day of any event or notice starting a specified duration.
- 8.1.2. Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.
- 8.1.3. The date of commencement of the Work is the date established in the NOTICE TO PROCEED AS ISSUED BY THE OWNER.
- 8.1.4. The date the Contractor reaches Substantial Completion is the date certified by the Architect/Engineer in accordance with Paragraph 9.8.
- 8.1.5. The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.
- 8.1.6. Liquidated Damages. The Owner may suffer loss if the project is not substantially complete on the date set forth in the contract documents. The Contractor and his surety shall be liable for and shall pay to the Owner the sums hereinafter stipulated as liquidated damages for each calendar day of delay until the work is substantially complete.
- 8.1.7. The Contractor shall not be charged liquidated or actual damages when delay in completion of the Work is due to:
  - 8.1.7.1. Any preference, priority or allocation order issued by the government;
  - 8.1.7.2. Unforeseeable cause beyond the control and without the fault or negligence of the Contractor, such as acts of God or of the public enemy, fires, floods, epidemics, quarantine restrictions, freight embargoes, and unusually severe weather. All such occurrences resulting in delay must be documented and approved by Change Order; or,
  - 8.1.7.3. Any delays of Subcontractors or suppliers occasioned by any of the causes specified in 8.1.7.1 and 8.1.7.2 of this article.

8.1.8. The Contractor is completely obligated and responsible to provide written notice of each day of delay as provided for in Paragraph 4.3.

8.1.9. Contract Time. All work shall reach Substantial Completion within: **BY NOVEMBER 15, 2024**. The Owner will issue a written NOTICE TO PROCEED and finalized contract.

## 8.2. **PROGRESS AND COMPLETION**

8.2.1. Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Contract, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

8.2.2. The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the date on the Notice to Proceed and in no case prior to the effective date of insurance required by Article 11 to be furnished by the Contractor. The date of commencement of the Work shall not be changed by the effective date of such insurance.

8.2.3. The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

8.2.4. If the Contractor falls behind the latest construction schedule by more than 14 calendar days through its own actions or inaction, neglect, inexperience, lack of oversight and management of the Work including that of any Subcontractors, written notice to the Owner and Architect/Engineer shall be provided within three (3) days with explanation of how the Contractor intends to get back on schedule. Response to getting back on schedule consists of providing a sufficient number of qualified workers and/or proper materials or an acceptably reorganized schedule to regain the lost time in a manner acceptable to the Owner.

## 8.3. **DELAYS AND EXTENSIONS OF TIME**

8.3.1. If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect/Engineer, or of an employee of either, or of a separate contractor employed by the Owner, or by changes ordered in the Work, or by fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, or by delay authorized by the Owner pending mediation and arbitration, or by other causes which the Architect/Engineer determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect/Engineer may determine.

8.3.2. Claims relating to time shall be made in accordance with applicable provisions of Paragraph 4.3.

8.3.3. This Paragraph 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

## **PAYMENTS AND COMPLETION**

### 9.1. **CONTRACT SUM**

9.1.1. The Contract Sum is stated in the Contract and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

### 9.2. **SCHEDULE OF VALUES**

9.2.1. Before the first Application for Payment, the Contractor shall submit to the Architect/Engineer a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Architect/Engineer may require. This schedule, unless objected to by the Architect/Engineer, shall be used as a basis for reviewing the Contractor's Applications for Payment.

### 9.3. **APPLICATIONS FOR PAYMENT**

- 9.3.1. The Contractor shall submit to the Architect/Engineer an itemized Application for Payment for operations completed in accordance with the Schedule of Values. Such application shall be signed and supported by such data substantiating the Contractor's right to payment as the Owner or Architect/Engineer may require, such as copies of requisitions from Subcontractors and material suppliers, and reflecting retainage if provided for in the Contract Documents.
- 9.3.2. NOTICE OF APPROVAL OF PAYMENT REQUEST PROVISION. Per Title 28, Chapter 2, Part 21, this contract allows the Owner to change the number of days to approve a Contractor's payment request. This contract allows the Owner to approve the Contractor's payment request within thirty-five (35) calendar days after it is received by the Owner without being subject to the accrual of interest.
- 9.3.3. As provided in Subparagraph 7.3.11, such applications may include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives, or by interim determinations of the Architect/Engineer, but not yet included in Change Orders.
- 9.3.4. Applications for payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier.
- 9.3.5. Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.
- 9.3.6. The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.
- 9.3.7. Until the work is complete, the Owner will pay 95% of the amount due the Contractor on account of progress payments.
- 9.3.7.1. If the Work and its progress are not in accordance with all or any part, piece, or portion of the Contract Documents, the Owner may, at its sole discretion and without claim by the Contractor, increase the amount held as retainage to whatever level deemed necessary to effectuate performance and progress of the Work, for anticipated repairs, warranties or completion of the Work by the Contractor or through the letting of other contracts. The Contractor will not be entitled to additional costs, expenses, fees, time, and such like, in the event the Owner increases the amount held as retainage due to non-compliance and/or non-performance with all or any part, piece, or portion of the Contract Documents.
- 9.3.7.2. Prior to the first application for payment, the Contractor shall submit the following information on the appropriate forms:
- 9.3.7.2.1. Schedule of Amounts for Contract Payment (Form 100): This form shall contain a breakdown of the labor, material and other costs associated with the various portions of the work and shall be the basis for the progress payments to the Contractor. The use of electronic method shall be in the Owner's format.
- 9.3.7.2.2. Project/Progress Schedule: If no Schedule (or revised Schedule) is provided with each and every Periodic Estimates for Partial Payment, the Architect/Engineer and/or Owner may return the pay request, or hold it, and may choose not pay for any portion of the Work until the appropriate Schedule, indicating all changes, revisions and updates, is provided. No claim for additional costs or interests will

be made by the Contractor or any subcontractor on account of holding or non-payment of the Periodic Estimate for Partial Payment request.

#### 9.3.7.3. Progress Payments

9.3.7.3.1. Periodic Estimates for Partial Payment shall be on a form provided by the Owner (Form 101) and submitted to the Architect/Engineer for payment by the Owner. Payment shall be requested for the labor and material incorporated in the work to date and for materials suitably stored, less the aggregate of previous payments, the retainage, and the 1% gross receipts tax.

9.3.7.3.2. The Contractor, by submission of any partial pay request, certifies that every request for partial payment is correct, true and just in all respects and that payment or credit had not previously been received. The Contractor further warrants and certifies, by submission of any partial pay request, that all previous work for which payment has been received is free and clear of all liens, disputes, claims, security interests, encumbrances, or causes of action of any type or kind in favor of the Contractor, subcontractors, material suppliers or other persons or entities and does release the Owner from such.

9.3.7.3.3. Progress payments do not constitute official acceptance of any portion of the work or materials whether stored on or off-site.

9.3.7.3.4. In compliance with 15-50-206 MCA, the Contractor will have 1% of his gross receipts withheld by the Owner from all payments due. Each subcontractor who performs work greater than \$80,000 shall have 1% of its gross receipts withheld by the Contractor. The Contractor shall notify the Department of Revenue on the department's prescribed forms.

9.3.7.4. The Contractor may submit obligations/securities in a form specified in 18-1-301 Montana Code Annotated (MCA) to be held by a Financial Institution in lieu of retainage by the Owner. The Owner will establish the amount that would otherwise be held as retainage. Should the Contractor choose to submit obligations/securities in lieu of retainage, the Owner will require the Financial Institution to execute the Owner's "Account Agreement for Deposit of Obligations Other Than Retainage" (Form 120) prior to submission of any obligations/securities in accordance with 18-1-302 MCA. The Contractor must extend the opportunity to participate in all obligations/securities in lieu of retainage on a pro rata basis to all subcontractors involved in the project and shall be solely responsible for the management and administration of same. The Owner assumes no liability or responsibility from or to the Contractor or Subcontractors regarding the latter's participation.

**9.3.7.5.** The Contractor shall maintain a monthly billing cycle.

#### 9.4. **CERTIFICATES FOR PAYMENT**

9.4.1. The Architect/Engineer will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect/Engineer determines is properly due, or notify the Contractor and Owner in writing of the Architect/Engineer's reasons for withholding certification in whole or in part as provided in Subparagraph 9.5.1. For the purposes of this paragraph regarding certification of payment, electronic mail and/or notes provided through the use of an electronic approval system shall constitute written notice.

9.4.2. The issuance of a Certificate for Payment will constitute a representation by the Architect/Engineer to the Owner, based on the Architect/Engineer's evaluation of the Work and the data comprising the Application for Payment, that the Work has progressed to the point indicated and that, to the best of the Architect/Engineer's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect/Engineer. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect/Engineer has: (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work;

(2) reviewed construction means, methods, techniques, sequences or procedures; (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or, (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

#### 9.5. **DECISIONS TO WITHHOLD CERTIFICATION**

9.5.1. The Architect/Engineer may withhold or reject a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect/Engineer's opinion the representations to the Owner required by Subparagraph 9.4.2 cannot be made. If the Architect/Engineer is unable to certify payment in the amount of the Application, the Architect/Engineer will notify the Contractor and Owner as provided in Subparagraph 9.4.1. If the Contractor and Architect/Engineer cannot agree on a revised amount, the Architect/Engineer will promptly issue a Certificate for Payment for the amount for which the Architect/Engineer is able to make such representations to the Owner. The Architect/Engineer may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect/Engineer's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Subparagraph 3.3.4, because of:

9.5.1.1. defective Work not remedied;

9.5.1.2. third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

9.5.1.3. failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;

9.5.1.4. reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

9.5.1.5. damage to the Owner or another contractor;

9.5.1.6. reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or,

9.5.1.7. persistent failure to carry out the Work in accordance with the Contract Documents.

9.5.2. When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

9.5.3. Owner's Right to Refuse Payment: The Architect/Engineer's approval, or partial approval, of the Contractor's request for payment shall not preclude or prevent the Owner from exercising any of its remedies under this Contract. The Owner shall have right to refuse to make payment(s) to the Contractor due to:

9.5.3.1. the Contractor's failure to perform the Work in compliance with the Contract Documents;

9.5.3.2. the Contractor's failure to correct any defective or damaged Work;

9.5.3.3. the Contractor's failure to accurately represent the Work performed in the pay request;

9.5.3.4. the Contractor's performance of its Work at a rate or in a manner that, in the Owner's opinion, is likely to result in the Work, or any portion thereof, to be delayed;

9.5.3.5. the Contractor's failure to use funds previously paid to it by the Owner to pay for the Contractor's Work-related obligations including, but not limited to, subcontractors and suppliers on this Project;

9.5.3.6. claims made, or anticipated by the Owner to be made, against the Owner or its property;

- 9.5.3.7. inclusion in the pay request of any amounts in dispute or part of a claim;
- 9.5.3.8. Damage or loss caused by the Contractor, including its subcontractors and suppliers; or,
- 9.5.3.9. The Contractor's failure or refusal to perform its obligations to the Owner.

9.6. **PROGRESS PAYMENTS**

- 9.6.1. After the Architect/Engineer has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents or the Owner may take any action the Owner deems necessary under Subparagraph 9.5.3.
- 9.6.2. The Contractor shall promptly pay each Subcontractor in accordance with Title 28, Chapter 2, Part 21, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.
- 9.6.3. The Contractor is prohibited from holding higher amounts in retainage on any Subcontractor than the Owner is holding from the Contractor.
- 9.6.4. The Architect/Engineer will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect/Engineer and Owner on account of portions of the Work done by such Subcontractor.
- 9.6.5. Neither the Owner nor Architect/Engineer shall have an obligation to pay, or to see to the payment of, money to a Subcontractor except as may otherwise be required by law.
- 9.6.6. Payment to material suppliers shall be treated in a manner similar to that provided in Subparagraphs 9.6.2, 9.6.3, 9.6.4, and 9.6.5.
- 9.6.7. A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.
- 9.6.8. Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

9.7. **FAILURE OF PAYMENT**

- 9.7.1. If the Owner does not approve payment to the Contractor within thirty-five (35) calendar days after the receipt of a certified Application for Payment, then the Contractor may, upon seven additional days' written notice to the Owner and Architect/Engineer, suspend the Work until payment of the amount owing has been received. Nothing in the Subparagraph shall limit the Owner's rights and options as provided in Subparagraph 9.5.3. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

9.8. **SUBSTANTIAL COMPLETION**

- 9.8.1. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

- 9.8.2. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect/Engineer a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.
- 9.8.3. Upon receipt of the Contractor's list, the Architect/Engineer will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect/Engineer's Inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect/Engineer. In such case, the Contractor shall then submit a request for another inspection by the Architect/Engineer to determine Substantial Completion.
- 9.8.4. The Contractor shall ensure the project is substantially complete prior to requesting any inspection by the Architect/Engineer so that no more than one (1) inspection is necessary to determine Substantial Completion for all or any portion of the Work. If the Contractor does not perform adequate inspections to develop a comprehensive list as required in Subparagraph 9.8.2 and does not complete or correct such items upon discovery or notification, the Contractor shall be responsible and pay for the costs of the Architect/Engineer's additional inspections to determine Substantial Completion.
- 9.8.5. When the Work or designated portion thereof is substantially complete, the Architect/Engineer will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion and which shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance. After issuance of the Certificate of Substantial Completion, the Contractor shall finish and complete all remaining items within thirty (30) calendar days of the date on the Certificate. The Architect/Engineer shall identify and fix the time for completion of specific items which may be excluded from the thirty (30) calendar day time limit. Failure to complete any items within the specified time frames may be deemed by the Owner as default of the contract on the part of the Contractor.
- 9.8.6. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety if there are claims or past payment issues, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

## 9.9. **PARTIAL OCCUPANCY OR USE**

- 9.9.1. The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect/Engineer as provided under Subparagraph 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect/Engineer.
- 9.9.2. Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect/Engineer shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work. Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.



- 9.9.3. Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

9.10. **FINAL COMPLETION AND FINAL PAYMENT**

- 9.10.1. Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect/Engineer will promptly make such inspection and, when the Architect/Engineer finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect/Engineer will approve the Contractor's final Certificate for Payment stating that to the best of the Architect/Engineer's knowledge, information and belief, and on the basis of the Architect/Engineer's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect/Engineer's signature on the Contractor's final Certificate for Payment will constitute a further representation that conditions listed in Subparagraph 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.
- 9.10.2. Neither final payment nor any remaining retainage shall become due until the Contractor submits to the Architect/Engineer:
- 9.10.2.1. completed Contractor's Affidavit of Completion, Payment of Debts and Claims, and Release of Liens (Form 106) that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied;
- 9.10.2.2. a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner;
- 9.10.2.3. a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents
- 9.10.2.4. Consent of Surety Company to Final Payment (Form 103); and,
- 9.10.2.5. if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner.
- 9.10.3. The Contractor and his surety accepts and assumes responsibility, liability, and costs for and agrees to defend and hold harmless the Owner for and against any and all actions as a result of the Owner making final payment.
- 9.10.4. By submitting any Application for Payment to the Architect/Engineer the Contractor and his surety certify and declare that all bills for materials, supplies, utilities and for all other things furnished or caused to be furnished by the Contractor and all Subcontractors and used in the execution of the Contract will be fully paid upon receipt of Final Payment and that there are no unpaid obligations, liens, claims, security interests, encumbrances, liabilities and/or demands of State Agencies, subcontractors, suppliers, mechanics, laborers or any others resulting from or arising out of any work done, caused to be done or ordered to be done by the Contractor under the contract.
- 9.10.5. In consideration of the prior payments and the final payment made and all payments made for authorized changes, the Contractor releases and forever discharges the Owner from any and all obligations, liens, claims, security interests, encumbrances and/or liabilities arising by virtue of the contract and authorized changes between the parties, either verbal or in writing, and any and all claims and demands of every kind and character whatsoever against the Owner, arising out of or in any way relating to the contract and authorized changes.
- 9.10.6. The date of Final Payment by the Owner shall constitute Final Acceptance of the Work. The determining date for the expiration of the warranty period shall be as specified in Paragraphs 3.5 and 12.2.2.

- 9.10.7. If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect/Engineer so confirms, the Owner shall, upon application by the Contractor and certification by the Architect/Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect/Engineer prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.
- 9.10.8. The making of final payment shall constitute a waiver of Claims by the Owner except those arising from:
- 9.10.8.1. liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- 9.10.8.2. failure of the Work to comply with the requirements of the Contract Documents; or,
- 9.10.8.3. terms of special warranties required by the Contract Documents.
- 9.10.9. Acceptance of final payment by the Contractor, a Subcontractor, or material supplier, shall constitute a waiver of any and all obligations, liens, claims, security interests, encumbrances and/or liabilities against the Owner except those previously made in writing per the requirements of Paragraph 4.3 and as yet unsettled at the time of submission of the final Application for Payment.
- 9.10.10. The Owner's issuance of Final Payment does not constitute a waiver or release of any kind regarding any past, current, or future claim the Owner may have against the Contractor and/or the surety.

## **ARTICLE 10 – PROTECTION OF PERSONS AND PROPERTY**

### **10.1. SAFETY**

- 10.1.1. **Importance of Safety.** The Contractor and all Subcontractors (at any tier or level) recognize that safety is paramount at all times. The Contractor shall perform the work in a safe manner with the highest regard for safety of its employees and all other individuals and property at the work site. Contractor shall maintain its tools, equipment, and vehicles in a safe operating condition and take all other actions necessary to provide a safe working environment for performance of work required under this Contract. The Contractor is solely responsible for the means, methods, techniques, sequences and procedures for coordinating and constructing the Work, including all site safety, safety precautions, safety programs, and safety compliance with OSHA and all other governing bodies.
- 10.1.2. **Particular Safeguards.** (a). The Contractor shall erect and maintain, as required by Paragraphs 10.1.1 and 10.1.3, safeguards for safety and protection, including posting danger signs and other warnings against hazards, installing suitable barriers and lighting, promulgating safety regulations, and providing notification to all parties who may be impacted by the Contractor's operations. (b) When use or storage of explosives or other Hazardous Materials/Substances (defined below) or equipment are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. (c) The Contractor shall not encumber or load or permit any part of the construction site to be encumbered or loaded so as to endanger the safety of any person(s).
- 10.1.3. **Compliance with Safety Laws.** Contractor represents and warrants to Owner that it knows and understands all federal, state and local safety statutes, rules, and regulations (Laws) related to the work under this Contract. Contractor shall comply with these Laws. Contractor shall keep all material data safety sheets on site and available at all times.
- 10.1.4. **Remedy property damage.** The Contractor shall promptly remedy damage and loss to property caused in whole or in part by the Contractor, a Subcontractor of any tier or level, or anyone employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Paragraph 3.18.

- 10.1.5. **Designation of Safety Representative.** Unless the Contractor designates, in writing to the Owner and the Architect/Engineer, another responsible member of the Contractor's organization as the Safety Representative, the Contractor's superintendent is the Safety Representative. The Safety Representative is defined as that member of the Contractor's organization responsible for all safety under this Contract.
- 10.1.6. **Release/Indemnity of Owner and Architect/Engineer.** The Contractor agrees that the Owner and Architect/Engineer are not responsible for safety at the work site and releases them from all obligations and liability regarding safety at the work site. The Contractor shall indemnify and defend the Owner and the Architect/Engineer against and from all claims, liabilities, fines, penalties, orders, causes of action, judgments, losses, costs and expenses (including but not limited to court costs and reasonable attorney fees), arising from injuries and death to any persons and damage to real and personal property arising from, in connection with, or incidental to Contractor's safety responsibilities under this Contract.

## 10.2. **HAZARDOUS MATERIALS/SUBSTANCES**

- 10.2.1. "Hazardous Materials/Substances" means any substance: (a) the presence of which requires investigation, or remediation under any federal, state or local statute, rule, regulation, ordinance, order, policy or common law; (b) that is or becomes defined as "hazardous waste," "hazardous substance," pollutant, or contaminant under any federal, state or local statute, rule, regulation, or ordinance or amendments thereto; (c) that is toxic, explosive, corrosive flammable, or otherwise hazardous and is or becomes regulated by any government authority, agency, board, commission or instrumentality of the United States, the state of Montana or any political subdivision thereof; (d) gasoline, diesel fuel or other petroleum hydrocarbons; (e) containing contains polychlorinated biphenyls (PCBs) or asbestos; or (f) the presence of which causes or threatens to cause a nuisance or trespass on the work site or adjacent property.
- 10.2.2. The Contractor is solely responsible for all compliance with all regulations, requirements, and procedures governing Hazardous Materials/Substances at the Work Site or that Contractor brings on the site. The Contractor is solely responsible for remediation, costs, damages, loss, and/or expenses for all Hazardous Materials/Substances brought to the site. The Contractor shall not and is strictly prohibited from purchasing and/or installing any asbestos-containing materials or products as part of the Work. Should the Contractor do so, the Contractor shall be solely responsible for the immediate remediation and all costs, damages, loss, and/or expenses per Paragraphs 10.1.6, 10.2.2, 10.2.3, and 10.2.4.
- 10.2.3. If the Contractor encounters Hazardous Materials/Substances during the course of the Work, whether or not identified in the Contract Documents, Work, the Contractor agrees that:
- 10.2.3.1. Encountering any Hazardous Materials/Substances during performance of the Work does not necessarily mean a change in conditions has occurred, nor is it evidence that the Contractor is due additional Contract Time or an increase in the Contract Sum. If encountering Hazardous Materials/Substances is determined to be a change in conditions to the Contract Documents, Paragraph 4.3 and Article 7 apply in determining any additional compensation or extension of time claimed by the Contractor.
- 10.2.3.2. The Contractor is solely responsible for securing the Work in accordance with this Article 10 involving any Hazardous Materials/Substances against unlawful, unregulated, or improper intrusion, disturbance, or removal. The Contractor shall implement protections and take protective actions throughout the performance of the Work to prevent exposure to workers, occupants, and contamination of the site or area.
- 10.2.3.3. If the Contractor is unable to or fails to properly secure the Work against unlawful, unregulated, or improper intrusion, disturbance, or removal of Hazardous Materials/Substances, the Contractor shall immediately implement protections and take protective actions, up to and including stopping Work in the area or on the item affected, to prevent exposure to workers, occupants, and contamination of the site or area. The Contractor shall immediately notify the Owner and Architect in writing giving details of the failure and the corrective actions taken. If the condition is an emergency and notice cannot be provided in writing, then Contractor shall orally and immediately notify the Owner and Architect/Engineer of the condition followed by a full written explanation. In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss.

10.2.3.4. If the Contractor notifies the Owner and takes precautions in accordance with this Article 10 upon encountering materials/substances suspected of containing asbestos or polychlorinated biphenyls that are unidentified in the Contract Documents, the Owner shall verify if the unidentified material or substance contains asbestos or polychlorinated biphenyls and shall arrange for the removal or other measures as necessary to allow the Contractor to proceed with the Work. The Contract Time may be extended as appropriate if the Work affected is on the critical path and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs as provided in Article 7. Should the Contractor fail to notify the Owner upon encountering asbestos, polychlorinated biphenyls, or materials/substances suspected of containing asbestos or polychlorinated biphenyls, that are unidentified in the Contract Documents, the Contractor is solely responsible for all mitigation in accordance with Paragraphs 10.1.6, 10.2.2, 10.2.3, and 10.2.4.

10.2.4. The Contractor shall indemnify, hold harmless, and defend the Owner from and against all claims, liabilities, fines, penalties, orders, causes of action, judgments, losses, costs and expenses, including but not limited to court costs and reasonable attorneys' fees, arising from, in connection with, or incidental to the Contractor's handling, disposal, encountering, or release of Hazardous Materials/Substances.

### 10.3. **UTILITIES**

10.3.1. Underground Utilities: Buried utilities, including, but not limited to, electricity, gas, steam, air, water, telephone, sewer, irrigation, broadband coaxial computer cable, and fiber optic cables are very vulnerable and damage could result in loss of service. The telephone, broadband and fiber optic cables are especially sensitive and the slightest damage to these components will result in disruption of the operations of the campus.

10.3.2. "One Call" must be notified by phone and in writing at least 72 hours (3 business days) prior to digging to arrange and assist in the location of buried utilities in the field. (Dial 811). The Contractor shall mark the boundary of the work area. The boundary area shall be indicated with white paint and white flags. In winter, pink paint and flags will be accepted.

10.3.3. After buried utilities have been located, the Contractor shall be responsible for any utilities damaged while digging. Such responsibility shall include all necessary care including hand digging. Contractor's responsibility shall also include maintaining markings after initial locate. The area for such responsibility, unless otherwise indicated, shall extend 24 inches to either side of the marked center line of a buried utility line.

10.3.4. The Contractor's responsibility shall include repair or replacement of damaged utilities. The Contractor will also be responsible for all costs associated with reterminations and recertification.

10.3.5. Any buried utilities exposed by the operations of the Contractor shall be marked on the plans and adequately protected by the Contractor. If any buried utilities not located are exposed, the Contractor shall immediately contact the Owner and the Architect/Engineer. If, after exposing an unlocated buried utility, the Contractor continues digging without notifying Owner and Architect/Engineer and further damages the utility, the Contractor will be fully and solely responsible.

10.3.6. Damage to irrigation systems during seasons of no irrigation that are not immediately and adequately repaired and tested will require the Contractor to return when the system is in service to complete the repair.

10.3.7. In the event of a planned interruption of any existing utility service, the Contractor shall make arrangements with Owner at least 72 hours (3 business days) in advance. Shutdowns of the broadband or fiber optic cables will normally require 5 working days' notice to the Owner. The Contractor shall bear all costs associated with the interruptions and restorations of service.

## **ARTICLE 11 - INSURANCE AND BONDS**

### 11.1. **CONTRACTOR'S LIABILITY INSURANCE**

- 11.1.1. The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the State of Montana with a rating no less than "A-", such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:
  - 11.1.1.1. claims under workers' compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed;
  - 11.1.1.2. claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
  - 11.1.1.3. claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
  - 11.1.1.4. claims for damages insured by usual personal injury liability coverage;
  - 11.1.1.5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting there from;
  - 11.1.1.6. claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
  - 11.1.1.7. claims for bodily injury or property damage arising out of completed operations; and,
  - 11.1.1.8. claims involving contractual liability insurance applicable to the Contractor's obligations under Paragraph 3.18.
- 11.1.2. The insurance required by Subparagraph 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from date of commencement of the Work until termination of any coverage required to be maintained after final payment.
- 11.1.3. Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These certificates and the insurance policies except Workers Compensation required by this Paragraph 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire at any time prior to Final Acceptance and then not until at least 30 days' prior written notice has been given to the Owner. The Workers Compensation policy will not be canceled or allowed to expire at any time prior to Final Acceptance and then not until at least 30 days' prior written notice has been given to the Owner by the Contractor. If any of the foregoing insurance coverages are required to remain in force after final payment, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by Subparagraph 9.10.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.
- 11.1.4. At the request of the Owner, the Contractor shall provide copies of all insurance policies to the Owner.

## 11.2. **INSURANCE, GENERAL REQUIREMENTS**

- 11.2.1. The Contractor shall maintain for the duration of the contract, at its cost and expense, insurance against claims for injuries to persons or damages to property, including contractual liability, which may arise from or in connection with the performance of the Work by the Contractor, its agents, employees, representatives, assigns, or subcontractors. The Contractor is responsible for all deductibles regardless of policy or level of coverage. The Owner reserves the right to demand, and the Contractor agrees to provide, copies of any and all policies at any time.

- 11.2.2. Hold Harmless and Indemnification: The Contractor shall protect, defend, and save the state, its elected and appointed officials, agents, and employees, while acting within the scope of their duties as such, harmless from and against all claims, liabilities, demands, causes of action, and judgments whatsoever (including the cost of defense and reasonable attorney fees): 1) arising in favor of or asserted by third parties on account of damage to property, personal injury, or death which injury, death, or damage; or, 2) arising out of or resulting from performance or failure to perform, or omissions of services, or in any way results from the negligent acts or omissions of the Contractor, its agents, agents, or subcontractors.
- 11.2.3. Contractor's Insurance: insurance required under all sections herein shall be in effect for the duration of the contract that extends through the warranty period. Insurance required herein shall be provided by insurance policies issued only by insurance companies currently authorized to do business in the state of Montana. No Contractor or Sub-contractor shall commence any Work under this contract until all required insurance has been obtained. During the term of this contract, the Contractor shall, not less than thirty days prior to the expiration date of any policy for which a certificate of insurance is required, deliver to the Owner a certificate of insurance with respect to the renewal insurance policy. The Contractor shall furnish one copy of insurance certificates of insurance herein required, which shall specifically set forth evidence of all coverage required by these contract documents and which shall be signed by authorized representatives of the insurance company or companies evidencing that insurance as required herein is in force with the exception of Workers Compensation and will not be canceled, limited or restricted without thirty days' written notice by certified mail to the contractor and the Owner. The Workers Compensation policy will not be canceled or allowed to expire at any time prior to Final Acceptance and then not until at least 30 days' prior written notice has been given to the Owner by the Contractor. The Contractor shall furnish to the Owner copies of any endorsements that are subsequently issued amending coverage or limits. Additionally, all certificates shall include the project name and A/E project number.
- 11.2.4. Certificates of Insurance and Endorsements. All certificates of insurance and the additional insured endorsements are to be received by the state prior to issuance of the Notice to Proceed. The contractor is responsible to ensure that all policies and coverages contain the necessary endorsements for the State being listed as an additional insured. The state reserves the right to require complete copies of all insurance policies at any time to verify coverage. The contractor shall notify the state within 30 days of any material change in coverage.

### 11.3. **WORKERS' COMPENSATION INSURANCE**

- 11.3.1. The Contractor shall carry **Workers' Compensation Insurance**. Such Workers' Compensation Insurance shall protect the Contractor from claims made by his own employees, the employees of any Sub-contractor, and also claims made by anyone directly or indirectly employed by the Contractor or Sub-contractor. The Contractor shall require each Sub-contractor similarly to provide Workers' Compensation Insurance.

### 11.4. **COMMERCIAL GENERAL LIABILITY INSURANCE**

- 11.4.1. Each Contractor shall carry per occurrence coverage **Commercial General Liability Insurance** including coverage for premises; operations; independent contractor's protective; products and completed operations; products and materials stored off-site; broad form property damage and comprehensive automobile liability insurance with not less than the following limits of liability:

11.4.1.1. **\$1,000,000 per occurrence; aggregate limit of \$2,000,000;**

- 11.4.2. The **Commercial General and Automobile Liability Insurance** shall provide coverage for both bodily injury, including accidental death, sickness, disease, occupational sickness or disease, personal injury liability coverage and property damage which may arise out of the work under this contract, or operations incidental thereto, whether such work and operations be by the Contractor or by any Subcontractor or by anyone directly or indirectly employed by the Contractor or by Sub-contractor, or by anyone for whose acts any of them may be liable. The Contractor shall maintain the liability insurance required herein for a period of not less than one year after final payment or anytime the Contractor goes on to the location of the project.

- 11.4.3. The Contractor's liability insurance policies shall list the STATE OF MONTANA as an additional insured. **AN ADDITIONAL INSURED ENDORSEMENT DOCUMENT SHALL BE SUBMITTED WITH THE CERTIFICATES OF INSURANCE.** The STATE OF MONTANA includes its officers, elected and appointed officials, employees and volunteers and political subdivisions thereof. Should the Contractor not be able to list the state as an additional insured, the Contractor shall purchase a per occurrence Owner's/Contractor's Protective Policy (OCP) with the STATE OF MONTANA as the insured party in the same occurrence and aggregate limits as that indicated above for the Contractor's Commercial General Liability Policy.
- 11.4.4. Property damage liability insurance shall be written without any exclusion for injury to or destruction of any building, structure, wires, conduits, pipes, or other property above or below the surface of the ground arising out of the blasting, explosion, pile driving, excavation, filling, grading or from the moving, shoring, underpinning, raising, or demolition of any building or structure or structural support thereof.
- 11.4.5. The Contractor's insurance coverage shall be PRIMARY insurance as respects the State, its officers, elected and appointed officials, employees and volunteers. Any insurance or self-insurance maintained by the state, its officers, elected and appointed officials, employees and volunteers shall be excess of the Contractor's insurance and shall not contribute to it. NO WAIVERS OF SUBROGATION OR ENDORSEMENTS LIMITING, TRANSFERRING, OR OTHERWISE INDEMNIFYING LIABLE OR RESPONSIBLE PARTIES OF THE CONTRACTOR OR ANY SUBCONTRACTOR WILL BE ACCEPTED.

#### 11.5. **PROPERTY INSURANCE (ALL RISK)**

- 11.5.1. New Construction (for projects involving new construction): At its sole cost and expense, the contractor shall keep the building and all other improvements on the premises insured throughout the term of the agreement against the following hazards:
- 11.5.1.1. Loss or damage by fire and such other risks (including earthquake damage for those areas with a shaking level at 10g or above as indicated on the seismic map, [NEHRP.pdf \(mt.gov\).pdf](#) in an amount sufficient to permit such insurance to be written at all times on a replacement cost basis. This may be insured against by attachment of standard form extended coverage endorsement to fire insurance policies. Certificates of Insurance MUST indicate earthquake coverage if coverage is required per the above referenced map.
- 11.5.1.2. Loss or damage from leakage or sprinkler systems now or hereafter installed in any building on the premises.
- 11.5.1.3. Loss or damage by explosion of steam boilers, pressure vessels, and oil or gasoline storage tanks, or similar apparatus now or hereafter installed in a building or buildings on the premises.
- 11.5.2. Building Renovation (for projects involving building renovation or remodeling):
- 11.5.2.1. The contractor shall purchase and maintain Builder's Risk/Installation insurance on a "special causes of loss" form (so called "all risk") for the cost of the work and any subsequent modifications and change orders. The contractor is not responsible for insuring the existing structure for Builder's Risk/Installation insurance.
- 11.5.2.2. At its sole cost and expense, the contractor shall insure all property construction on the premises throughout the term of the agreement against the following hazards:
- 11.5.2.2.1. Loss or damage by fire and such other risks (including earthquake damage for those areas with a shaking level at 10g or above as indicated on the seismic map at <http://rmtd.mt.gov/Portal/62/aboutus/publications/files/NEHRP.pdf> in an amount sufficient to permit such insurance to be written at all times on a replacement cost basis. This may be insured against by attachment of standard form extended coverage endorsement to fire policies. Certificates of Insurance MUST indicate earthquake coverage if coverage is required per the above referenced map.
- 11.5.2.2.2. Loss or damage from leakage or sprinkler systems now or hereafter installed in any building on the premises.

- 11.5.2.2.3. Loss or damage by explosion of steam boilers, pressure vessels, oil or gasoline storage tanks, or similar apparatus now or hereafter installed in a building or buildings on the premises.

**11.6. ASBESTOS ABATEMENT INSURANCE**

- 11.6.1. If Asbestos Abatement is identified as part of the Work under this contract, the Contractor or any subcontractor involved in asbestos abatement shall purchase and maintain **Asbestos Liability Insurance** for coverage of bodily injury, sickness, disease, death, damages, claims, errors or omissions regarding the asbestos portion of the work ***in addition to*** the CGL Insurance by reason of any negligence in part or in whole, error or omission committed or alleged to have been committed by the Contractor or anyone for whom the Contractor is legally liable.
- 11.6.2. Such insurance shall be in "per occurrence" form and shall clearly state on the certificate that asbestos work is included in the following limits:
  - 11.6.2.1. **\$1,000,000 per occurrence; aggregate limit of \$2,000,000.**
- 11.6.3. Asbestos Liability Insurance as carried by the asbestos abatement subcontractor in these limits in lieu of the Contractor's coverage is acceptable provided the Contractor and the State of Montana are named as additional insureds and that the abatement subcontractor's insurance is PRIMARY as respects both the Owner and the Contractor. If the Contractor or any other subcontractor encounters asbestos, all operations shall be suspended until abatement with the associated air monitoring clearances are accomplished. The certificate of coverage shall be provided by the asbestos abatement subcontractor to both the Contractor and the Owner.

**11.7. PERFORMANCE BOND AND LABOR & MATERIAL PAYMENT BOND (BOTH ARE REQUIRED ON ANY PROJECT WITH TOTAL PRICE EXCEEDING \$150,000.00)**

- 11.7.1. The Contract shall furnish a Performance Bond in the amount of 100% of the contract price as security for the faithful performance of his contract (18-2-201 MCA). The Contractor shall also furnish a Labor and Material Payment Bond in the amount of 100% of the contract price as security for the payment of all persons performing labor and furnishing materials in connection therewith (18-2-201MCA). The bonds shall be executed on forms furnished by the Owner and no other forms or endorsements will be acceptable. The bonds shall be signed in compliance with state statutes (33-17-1111 MCA). Bonds shall be secured from a state licensed bonding company. Power of Attorney is required with each bond. Attorneys-in-fact who sign contract bonds must file with each bond a certified and effectively dated copy of their power of attorney:
  - 11.7.1.1. one original copy shall be furnished with each set of bonds.
  - 11.7.1.2. Others furnished with a set of bonds may be copies of that original.
- 11.7.2. The Owner reserves the right at any time during the performance of Work to require bonding of Subcontractors provided by the General Contractor. Should this occur, the Owner will cover the direct cost. This shall not be construed as to in any way affect the relationship between the General Contractor and his Subcontractors.
- 11.7.3. Surety must have an endorsement stating that their guarantee of Contractor's performance automatically covers the additional contract time added to a Contractor's contract by Change Order.
- 11.7.4. A change in the Contractor's organization shall not constitute grounds for Surety to claim a discharge of their liability and requires an endorsement from Surety so stating.
- 11.7.5. Except as noted below, the Contractor is required to notify Surety of any increase in the contract amount resulting from a Change Order within 48 hours of signing and submitting a Change Order and shall submit a copy of Surety's written acknowledgment and consent to Owner before a Change Order can be approved. The Surety's written acknowledgment and consent on the Change Order form shall also satisfy this consent requirement.



- 11.7.5.1. Surety consent shall not be required on Change Order(s) which, in the aggregate total amount of all Changes Orders, increase the original contract amount by less than 10%. However, the Contractor is still required to notify Surety of any increase in contract amount resulting from a Change Order(s) within 48 hours of signing and submitting every Change Order.
- 11.7.5.2. Surety is fully obligated to the Owner for the full contract amount, inclusive of all Change Orders, regardless of whether or not written acknowledgement and consent is received and regardless of whether or not the aggregate total of all Change Orders is more or less than 10% of the original contract amount.
- 11.7.5.3. A fax with hard copy to follow of Surety's written acknowledgment and consent is acceptable. If hard copy is not received by Owner before Application for Payment on any portion or all of said Change Order, it will not be accepted by Owner for payment.
- 11.7.6. The Surety must take action within 30 days of notice of default on the part of the Contractor or of any claim on bonds made by the Owner or any Subcontractor or supplier.

## **ARTICLE 12 - UNCOVERING AND CORRECTION OF WORK**

### **12.1. UNCOVERING OF WORK**

- 12.1.1. If a portion of the Work is covered contrary to the Architect/Engineer's request or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Architect/Engineer, be uncovered for the Architect/Engineer's examination and be replaced at the Contractor's expense without change in the Contract Time.
- 12.1.2. If a portion of the Work has been covered which the Architect/Engineer has not specifically requested to examine prior to it being covered, the Architect/Engineer may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

### **12.2. CORRECTION OF WORK**

#### **12.2.1. BEFORE OR AFTER SUBSTANTIAL COMPLETION**

- 12.2.1.1. The Contractor shall promptly correct Work that fails to conform to the requirements of the Contract Documents or that is rejected by the Architect/Engineer, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections and compensation for the Architect/Engineer's services and expenses made necessary thereby, shall be at the Contractor's expense. The Contractor is responsible to discover and correct all defective work and shall not rely upon the Architect/Engineer's or Owner's observations.
- 12.2.1.2. Rejection and Correction of Work in Progress. During the course of the Work, the Contractor shall inspect and promptly reject any Work that:
  - 12.2.1.2.1. does not conform to the Construction Documents; or,
  - 12.2.1.2.2. does not comply with any applicable law, statute, building code, rule or regulation of any governmental, public and quasi-public authorities, and agencies having jurisdiction over the Project.
- 12.2.1.3. The Contractor shall promptly correct or require the correction of all rejected Work, whether observed before or after Substantial Completion. The Contractor shall bear all costs of correcting such Work, including additional testing, inspections, and compensation for all services and expenses necessitated by such corrective action.

## 12.2.2. AFTER SUBSTANTIAL COMPLETION AND AFTER FINAL ACCEPTANCE

12.2.2.1. In addition to the Contractor's obligations under Paragraph 3.5, if, within one year after the date of Final Acceptance of the Work or designated portion thereof or after the date for commencement of warranties, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect/Engineer, the Owner may correct it in accordance with Paragraph 2.3.

12.2.2.1.1. The Contractor shall remedy any and all deficiencies due to faulty materials or workmanship and pay for any damage to other work resulting there from, which shall appear within the period of Substantial Completion through one (1) year from the date of Final Acceptance in accordance with the terms and conditions of the Contract and with any special guarantees or warranties provided in the Contract Documents. The Owner shall give notice of observed deficiencies with reasonable promptness. All questions, claims or disputes arising under this Article shall be decided by the Architect/Engineer. All manufacturer, product and supplier warranties are in addition to this Contractor warranty.

12.2.2.1.2. The Contractor shall respond within seven (7) days after notice of observed deficiencies has been given and he shall proceed to immediately remedy these deficiencies.

12.2.2.1.3. Should the Contractor fail to respond to the notice or not remedy those deficiencies; the Owner shall have this work corrected at the expense of the Contractor.

12.2.2.1.4. Latent defects shall be in addition to those identified above and shall be the responsibility of the Contractor per the statute of limitations for a written contract (27-2-208 MCA) starting from the date of Final Acceptance.

12.2.2.2. The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work.

12.2.2.3. The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Paragraph 12.2.

12.2.3. The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

12.2.4. The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

12.2.5. Nothing contained in this Paragraph 12.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the one-year period for correction of Work as described in Subparagraph 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

## 12.3. ACCEPTANCE OF NONCONFORMING WORK

- 12.3.1. If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

## **ARTICLE 13 - MISCELLANEOUS PROVISIONS**

### **13.1. GOVERNING LAW**

- 13.1.1. The Contract shall be governed by the laws of the State of Montana and venue for all legal proceedings shall be the First Judicial District, Lewis & Clark County.

### **13.2. SUCCESSORS AND ASSIGNS**

- 13.2.1. The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempt to make such assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

### **13.3. WRITTEN NOTICE**

- 13.3.1. Written notice shall be deemed to have been duly served if delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.

### **13.4. RIGHTS AND REMEDIES**

- 13.4.1. Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.
- 13.4.2. No action or failure to act by the Owner, Architect/Engineer or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

### **13.5. TESTS AND INSPECTIONS**

- 13.5.1. Quality Control (i.e. ensuring compliance with the Contract Documents) and Quality Assurance (i.e. confirming compliance with the Contract Documents) are the responsibility of the Contractor. Testing, observations, and/or inspections performed or provided by the Owner are solely for the Owner's own purposes and are for the benefit of the Owner. The Owner is not liable or responsible in any form or fashion to the Contractor regarding quality control or assurance or extent of such assurances. The Contractor shall not, under any circumstances, rely upon the Owner's testing or inspections as a substitute or in lieu of its own Quality Control or Assurance programs.
- 13.5.2. Tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made at an appropriate time. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect/Engineer timely notice of when and where tests and inspections are to be made so that the Architect/Engineer may be present for such procedures. The Owner shall bear costs of tests, inspections or approvals which do not become requirements until after bids are received or negotiations concluded.
- 13.5.3. If the Architect/Engineer, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Subparagraph 13.5.2, the Architect/Engineer will, upon written authorization from the Owner, instruct the Contractor to make

arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect/Engineer of when and where tests and inspections are to be made so that the Architect/Engineer may be present for such procedures. Such costs, except as provided in Subparagraph 13.5.4 shall be at the Owner's expense.

- 13.5.4. If such procedures for testing, inspection or approval under Subparagraphs 13.5.2 and 13.5.3 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect/Engineer's services and expenses shall be at the Contractor's expense.
- 13.5.5. Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect/Engineer.
- 13.5.6. If the Architect/Engineer is to observe tests, inspections or approvals required by the Contract Documents, the Architect/Engineer will do so promptly and, where practicable, at the normal place of testing.
- 13.5.7. Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

#### 13.6. **INTEREST**

- 13.6.1. Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

#### 13.7. **COMMENCEMENT OF STATUTORY LIMITATION PERIOD**

- 13.7.1. As between the Owner and Contractor:

- 13.7.1.1. **Before Substantial Completion.** As to acts or failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such date of Substantial Completion;
- 13.7.1.2. **Between Substantial Completion and Final Certificate for Payment.** As to acts or failures to act occurring subsequent to the relevant date of Substantial Completion and prior to issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of issuance of the final Certificate for Payment; and,
- 13.7.1.3. **After Final Payment.** As to acts or failures to act occurring after the relevant date of issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to any Warranty provided under Paragraph 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Paragraph 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor or Owner, whichever occurs last.

#### 13.8. **PAYROLL AND BASIC RECORDS**

- 13.8.1. Payrolls and basic records pertaining to the project shall be kept on a generally recognized accounting basis and shall be available to the Owner, Legislative Auditor, the Legislative Fiscal Analyst or his authorized representative at mutually convenient times. Accounting records shall be kept by the Contractor for a period of three years after the date of the Owner's Final Acceptance of the Project.

### **ARTICLE 14 – TERMINATION OR SUSPENSION OF THE CONTRACT**

#### 14.1. **TERMINATION BY THE CONTRACTOR**

- 14.1.1. The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:
  - 14.1.1.1. issuance of an order of a court or other public authority having jurisdiction which requires all Work to be stopped; or,
  - 14.1.1.2. an act of government, such as a declaration of national emergency which requires all Work to be stopped.
- 14.1.2. The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Paragraph 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.
- 14.1.3. If one of the reasons described in Subparagraph 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect/Engineer, terminate the Contract and recover from the Owner payment for Work executed and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead and profit but not damages.
- 14.1.4. If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has persistently failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect/Engineer, terminate the Contract and recover from the Owner as provided in Subparagraph 14.1.3.

#### 14.2. **TERMINATION BY THE OWNER FOR CAUSE**

- 14.2.1. The Owner may terminate the Contract if the Contractor:
  - 14.2.1.1. persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
  - 14.2.1.2. fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
  - 14.2.1.3. persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction; or,
  - 14.2.1.4. otherwise is guilty of any breach of a provision of the Contract Documents.
- 14.2.2. When any of the above reasons exist, the Owner, upon certification by the Architect/Engineer that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:
  - 14.2.2.1. take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
  - 14.2.2.2. accept assignment of subcontracts pursuant to Paragraph 5.4; and,
  - 14.2.2.3. finish the Work by whatever reasonable method the Owner may deem expedient. Upon request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

- 14.2.3. When the Owner terminates the Contract for one of the reasons stated in Subparagraph 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.
- 14.2.4. If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect/Engineer's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Architect/Engineer, upon application, and this obligation for payment shall survive termination of the Contract.

**14.3. SUSPENSION BY THE OWNER FOR CONVENIENCE**

- 14.3.1. The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.
- 14.3.2. The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Subparagraph 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:
  - 14.3.2.1. that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or,
  - 14.3.2.2. that an equitable adjustment is made or denied under another provision of the Contract.

**14.4. TERMINATION BY THE OWNER FOR CONVENIENCE**

- 14.4.1. The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.
- 14.4.2. Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:
  - 14.4.2.1. cease operations as directed by the Owner in the notice;
  - 14.4.2.2. take actions necessary, or that the Owner may direct, for the protection and preservation of the Work, and;
  - 14.4.2.3. except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.
- 14.4.3. In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination. The Contractor shall provide a full and complete itemized accounting of all costs.

**ARTICLE 15 – EQUAL OPPORTUNITY**

- 15.1. The Contractor and all Sub-contractors shall not discriminate against any employee or applicant for employment because of race, color, sex, pregnancy, childbirth or medical conditions related to pregnancy or childbirth, political or religious affiliation or ideas, culture, creed, social origin or condition, genetic information, sexual orientation, gender identity or expression, national origin, ancestry, age, disability, military service or veteran status, or marital status, or physical or mental disability and shall comply with all Federal and State laws concerning fair labor standards and hiring practices. The Contractor shall ensure that applicants are employed, and that employees are treated during employment, without regard to race, color, sex, pregnancy, childbirth or medical conditions related to pregnancy or childbirth, political or religious affiliation or ideas, culture, creed, social origin or condition, genetic information, sexual orientation, gender identity or expression, national origin, ancestry, age, disability, military service or veteran status, or marital status, or physical or mental disability.
- 15.2. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and

selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

15.3. The Contractor and all Sub-contractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, color, sex, pregnancy, childbirth or medical conditions related to pregnancy or childbirth, political or religious affiliation or ideas, culture, creed, social origin or condition, genetic information, sexual orientation, gender identity or expression, national origin, ancestry, age, disability, military service or veteran status, or marital status, or physical or mental disability.

15.4. The contractor shall not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association, and the Contractor shall not discriminate during the term of the contract against a firearm entity or firearm trade association. This section shall be construed in accordance with 30-20-301, MCA.

15.4.1. The provisions of 30-20-301, MCA apply only to a contract that:

15.4.1.1. is between a governmental entity and a company with at least 10 full-time employees; and

15.4.1.2. has a value of at least \$100,000 that is paid wholly or partly from public funds of the governmental entity.

15.4.2. By the signing the contract, the Contractor certifies and affirms:

15.4.2.1. Contractor does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association during the term of this contract; and

15.4.2.2. Contractor will not discriminate against a firearm entity or firearm trade association during the term of this contract.

15.4.3. The contractor's certification is made in compliance with and in reference to 30-20-301, MCA, and the terms defined therein. If the contractor determines the provisions of 30-20-301, MCA don't apply to the contract, the Contractor shall submit a statement set forth in details the basis for such determination.

[END OF GENERAL CONDITIONS]

## **SUPPLEMENTAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION**

(REVISED NOVEMBER 2023)

### FOR STATE OF MONTANA GENERAL CONDITIONS

#### **ARTICLE 1 – GENERAL PROVISIONS**

##### **1.1 BASIC DEFINITIONS**

###### **1.1.3 SPECIFICATIONS**

**1.1.3.1 ADD:** “Approved”: When used to convey Architect’s/Engineer’s action on Contractor’s submittals, applications, and requests, “approved” is limited to Architect’s/Engineer’s duties and responsibilities as stated in the Conditions of the Contract.

**1.1.3.2 ADD:** “Directed”: A command or instruction by Architect/Engineer. Other terms including “requested,” “authorized,” “selected,” “required,” and “permitted” have the same meaning as “directed.”

**1.1.3.3 ADD:** “Indicated”: Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including “shown,” “noted,” “scheduled,” and “specified” have the same meaning as “indicated.”

**1.1.3.4 ADD:** “Regulations”: Laws ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

**1.1.3.5 ADD:** “Furnish”: Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

**1.1.3.6 ADD:** “Install”: Operations at Project site including unloading, temporarily shoring, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

**1.1.3.7 ADD:** “Provide”: Furnish and install, complete and ready for the intended use.

**1.1.3.8 ADD:** “Project site”: Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land or portion of the building on which the Project is to be built.

**1.6.1 Insert** in the sixth line: “All documents which constitute the instruments of service are the property of the Owner.” In lieu of the phrase “Unless otherwise indicated, the Architect/Engineer and the Architect/Engineer’s consultants shall be deemed the authors of them... except as defined in the Owner’s Contract with the Architect/Engineer.”

#### **ARTICLE 2 – THE OWNER**

##### **2.1 THE STATE OF MONTANA**

**2.1.1.1 ADD:** The State of Montana includes its officers, elected and approved officials, employees and volunteers, and political subdivisions thereof. The State of Montana and Montana State University are synonymous throughout the contract documents.

#### **ARTICLE 3 – THE CONTRACTOR**

##### **3.3 SUPERVISION AND CONSTRUCTION PROCEDURES**

###### **3.3.6 ADD: PRODUCT DELIVERY, STORAGE AND HANDLING**



**3.3.6.1 ADD:** Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer’s written instructions.

**3.3.6.2 ADD: DELIVERY AND HANDLING:**

**3.3.6.2.1 ADD:** Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.

**3.3.6.2.2 ADD:** Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

**3.3.6.2.3 ADD:** Deliver products to Project site in an undamaged condition in manufacturer’s original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

**3.3.6.2.4 ADD:** Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and property protected.

**3.3.6.3 ADD: STORAGE**

**3.3.6.3.1 ADD:** Store products to allow for inspection and measurement of quantity or counting of units

**3.3.6.3.2 ADD:** Store materials in a manner that will not endanger Project structure.

**3.3.6.3.3 ADD:** Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.

**3.3.6.3.4 ADD:** Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.

**3.3.6.3.5 ADD:** Comply with product manufacturer’s written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.

**3.3.6.3.6 ADD:** Protect stored products from damage and liquids from freezing.

**3.10 CONSTRUCTION SCHEDULES**

**3.10.1.1 ADD:** A pre-construction meeting will be held at a time mutually agreed upon by the Owner, Architect/Engineer and Contractor at Campus Planning, Design and Construction, Montana State University, Bozeman, Montana. The contractor shall confirm the Contractor’s Construction Schedule for the Work. Coordination of operating requirements of the affected buildings, and surrounds, schedule of activities and Owner requirements will be discussed, as well as the order in which the Contractor intends to pursue the work. This schedule will be reviewed and must be mutually agreed upon by the Architect, Contractor and Owner.

**3.11 DOCUMENTATION AND AS-BUILT CONDITIONS AT THE SITE**

**3.11.4 ADD:** The contractor shall maintain at the site two (2) construction reference sets of all specifications, drawings, approved shop drawings, change orders and other modifications, addenda, schedules and instructions, in good order.

**3.11.4.1 ADD:** The record drawings shall be two (2) sets of black (or blue) and white prints of the drawings on which the contractor must record all “red line” changes during the course of construction and will include references to change order numbers, field directives, etc., and their dates. This record set shall be maintained separate and apart from documents used for construction reference. This set will be available for review by the project consultant, architect, engineer and MSU project manager at all times.

**3.11.4.2 ADD:** All as-built conditions shall be kept current and the contractor shall not permanently conceal or cover any work until all required information has been recorded.

**3.11.4.3 ADD:** All survey and exterior underground utilities shall be recorded using the spatial reference, Montana State Plane, NAD 83, CORS 96, Lambert Conformal Conic. The National Geodetic Survey publishes NAD 83

coordinates in the metric system (i.e., meters). The conversion factor that should be used to convert between English and metric systems is the international conversion factor of 1 ft. = 0.3048 m. coordinate system.

**3.11.4.4 ADD:** In marking any as-built conditions, the contractor shall ensure that such drawings indicate by measured dimension to building corners or other permanent monuments the exact locations of all piping, conduit or utilities concealed in concrete slabs, behind walls or ceilings or underground. Record drawings shall be made to scale and shall also include exact locations of valves, pull boxes and similar items as required for maintenance or repair service.

**3.11.4.5 ADD:** The contractor shall prepare and maintain a binder with all project warranty information. This will be provided to the project consultant, architect or engineer at final acceptance.

### **3.12.1 DEFINITIONS:**

**3.12.1.4 ADD:** Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term “product” includes the terms “material,” “equipment,” “system,” and terms of similar intent.

**3.12.1.5 ADD:** Named Products: Items identified by manufacturer’s product name, including make or model number or other designation shown or listed in manufacturer’s published product literature that is current as of date of the Contract Documents.

**3.12.1.6 ADD:** New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.

**3.12.1.7 ADD:** Comparable Products: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

**3.12.1.8 ADD:** Basis-of-Design Product Specification: A specification in which a specific manufacturer’s product is named and accompanied by the words “basis-of-design product,” including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specifications.

### **3.13. USE OF SITE**

**3.13.3 ADD:** MSU BOZEMAN Vehicle Regulations state:

“All students, faculty, staff, and visitors must register any motor vehicle they park on the University campus, for any reason. A visitor is anyone not defined as student, staff or faculty.”

All Contractor and Contractor employees shall comply with Montana State University parking regulations. MSU parking permits can be purchased at the Huffman Building at Seventh Avenue and Kagy Boulevard. Contractor should call University Police at 994-2121 for permit information. Violators of MSU Bozeman Vehicle Regulations may be ticketed and towed.

Unless otherwise indicated on the drawings, all Contractor and Contractor employee vehicles on campus shall be parked in designated parking lots. If allowed on the drawings, vehicles to a maximum number stated, may be parked in project site areas designated and shall only be Contractor vehicles with company signs clearly visible. No personal vehicles shall be parked at the project site in any case. If a driver of a vehicle not allowed to be parked at the project site must unload equipment, tools, or materials, the vehicle must be immediately thereafter moved to a designated lot or leave campus. Vehicles parked in the project site, other than those allowed on the drawings, may be ticketed and towed.

Access to the project site shall be only by the route designated on the drawings. In cases where a different route must be used for a specific purpose, permission must be obtained from MSU Facilities Services. In no case will vehicles be used on the Centennial Mall paving. Access routes are for delivery of equipment, tools, and not for parking.

Site staging areas for materials and equipment if permitted, will be designated on the drawings if permitted. If not designated, staging is intended to be in the construction area boundaries. Staged materials and equipment must be secured on the ground surface or in trailers. Site staging areas shall be fenced.

**3.13.4 ADD:** The Contractor shall coordinate his operations with the Owner in order that the Owner will have maximum use of existing facilities surrounding the area of the Work, as agreed upon, at all times during normal working hours. Contractor further agrees to coordinate his operations so as to avoid interference with the Owner's normal operations to as great an extent as possible.

**3.13.5 ADD:** By acceptance of MSU Building Keys the Contractor agrees with the following: University keys are the property of Montana State University. Fabricating, duplicating or modifying University keys is prohibited. Doors must remain locked at all times. The use of these keys to allow unauthorized persons to enter the above areas is prohibited. Loss of any key must be reported immediately to the Director, Office of Facilities Services and University Police, if the loss of keys results in re-keying costs, these costs will be charged to the Contractor. **See attached Estimated Re-Keying Costs.**

**3.13.6 ADD:** The Montana Legislature decreed that the "right to breath smoke-free air has priority over the desire to smoke" (MCA 20-40-102). It is the policy of MSU to promote the health, wellness and safety of all employees, students, guests, visitors, and contractors while on campus. Therefore, the campus will be free of tobacco-use effective August 1, 2012. The use of tobacco (including cigarettes, cigars, pipes, smokeless tobacco and all other tobacco products) by students, faculty, staff, guests, visitors, and contractors is prohibited on all properties owned or leased by MSU.

Littering any university property, whether owned or leased, with the remains of tobacco products is prohibited.

All university employees, students, visitors, guests, and contractors are required to comply with this policy, which shall remain in effect at all times. Refusal to comply with this policy may be cause for disciplinary action in accordance with employee and student conduct policies. Refusal to comply with the policy by visitors, guests and contractors may be grounds for removal from campus. ([http://www2montana.edu/policy/smoking\\_facilities/](http://www2montana.edu/policy/smoking_facilities/))

**3.13.7 ADD:** The Contractor may use the University's toilet facilities only as directed by the Owner.

## **ARTICLE 4 – ADMINISTRATION OF THE CONSTRUCTION CONTRACT**

### **4.6. ARBITRATION**

**4.6.3 Insert** in the second line "the Eighteenth Judicial District, Gallatin County" in lieu of "First Judicial District, Lewis & Clark County."

**4.6.11 ADD:** In responding to a claim brought by a Contractor, the Owner shall have a minimum of forty-five (45) days in which to respond to a revised claim prior to the arbitration hearing.

## **ARTICLE 7 – CHANGES IN WORK**

### **7.2 CHANGE ORDERS**

**7.2.2.1 Insert** the word "maximum" before "5%" and insert the word "maximum" before "10%".

**7.2.2.4 ADD:** Total Change Order markup shall not exceed (cost of the work) x 1.15.

**7.2.3.1 Insert** at the beginning of the first sentence the word "Itemized".

**7.2.3.2 Insert** at the beginning of the first sentence the word "Itemized".

**7.2.3.3 Insert** at the beginning of the first sentence the word "Itemized".

**7.2.3.4 ADD:** The Contractor shall provide a complete description summarizing all work involved.

## **ARTICLE 8 - TIME**

### **8.1. DEFINITIONS**

**8.1.8.1 ADD:** The Owner will issue a written Notice to Proceed on satisfactory receipt of the signed Contract and all required bonds, insurance and other required submittals. Work commenced before receipt of the Notice to Proceed will be entirely at the Contractor's risk.

## **8.2. PROGRESS AND COMPLETION**

**8.2.5 ADD:** Completion of the work within the stated time and/or by the date stated on the Notice to Proceed is of the essence of this Contract and failure to complete, without approved time extension, may be considered default of the Contract. At the time for completion as stated on the Notice to Proceed or as extended by approved change order, if the work is not substantially complete, the Owner may notify the Contractor and the Contractor's surety company in writing of the recourse the Owner intends to take, within the Contract, to assess liquidated damages and /or cause the work to be completed.

## **8.3. DELAYS AND EXTENSIONS OF TIME**

**8.3.4 ADD:** By the act of signing the Contract, the Contractor signifies that he/she and all subcontractors can perform the work within the stated schedule and that subcontractors, manufacturers, suppliers, and deliverers are known to be able to support the schedule. Time extension may be granted for unforeseen conditions or events out of the Contractor's control causing delay in delivery of materials or causing delay in the Contractor's ability to perform the work within the Contract Documents. The Contractor is expected to take all possible measures and bear all reasonable costs in order to anticipate, control, counteract, and expedite such delay-causing conditions, including finding alternative sources of materials, equipment, shipping, and labor. Notification of any claim for schedule delay must be made in writing to the Owner within one week of the causing event or of first knowledge of a known delay causing condition with supporting documentation as required by the Owner. The Owner will respond in writing within one week to claims of delay. No claims of delay will be entertained after the date of completion as stated on the Notice to Proceed or as extended by previously approved delay claims.

## **ARTICLE 9 – PAYMENTS AND COMPLETION**

### **9.3. APPLICATIONS FOR PAYMENT**

**9.3.7.2.1. Insert** in the first line "Schedule of Values" in lieu of "Schedule of Amounts for Contract Payment".

**9.3.7.2.3 ADD:** Subcontractor's List: The Contractor shall list all subcontractors doing work in excess of \$5,000.

### **9.8. SUBSTANTIAL COMPLETION**

**9.8.4.1 ADD:** Prior to the inspection, the Contractor shall complete the final clean-up of the project site which, unless otherwise stated in the Contract Documents, shall consist of:

**9.8.4.1.1** Removal of all debris and waste. All construction debris and waste shall be removed from the campus grounds. Use of the University trash containers will not be permitted.

**9.8.4.1.2** Removal of all stains, smears, marks of any kind from surfaces including existing surfaces if said damage is the result of the work.

**9.8.4.1.3** Removal of all temporary structures and barricades.

### **9.10. FINAL COMPLETION AND FINAL PAYMENT**

**9.10.2.4 Insert** in the first line after the word "(Form 103)": "for contracts greater than or equal to \$150,000"

## **ARTICLE 10 – PROTECTIONS OF PERSONS AND PROPERTY**

### **10.1. SAFETY**

**10.1.2 Insert** in the second line before the word "safeguards": "and as approved by Owner,"

**10.1.2.1 ADD:** The Contractor recognizes that the Work will be conducted in and around buildings and areas that are occupied and will continue to function for the purposes of the University. The Contractor shall conduct a project safety meeting prior to the start of the Work, with the Owner's representative and all others that the Owner's representative deems necessary. The purpose of the meeting shall be to produce project specific rules and guidelines pertaining to but not restricted to: safety of persons in and around the area of the Work including type and location of fencing, guards, signage, etc.; closing of existing campus circulation routes and designation of alternate routes,

including creation of temporary routes of access as required; creation and location of temporary signage as required to maintain accessible routes for handicapped access to and around the site of the Work. The Contractor shall be solely responsible for implementing all required means and methods for site safety and security that may be agreed upon in this meeting.

**10.1.2.2 ADD:** Contractor shall notify Owner any time his operations will disrupt use of and access to existing accessible routes. Contractor is solely responsible for maintaining existing accessible routes in the area of the project with the exception of temporary interruptions lasting one day or less. Contractor is responsible for erecting signage identifying temporary re-routing of accessible routes. Such re-routing shall be coordinated with Owner in advance.

### **10.3. UTILITIES**

**10.3.1 ADD:** Underground Utilities: Buried utilities, including, but not limited to, electricity, gas, steam, air, water, telephone, sewer, irrigation, broadband coaxial computer cable, and fiber optic cables are very vulnerable and damage could result in loss of service. The telephone, broadband and fiber optic cables are especially sensitive and the slightest damage to these components will result in disruption of the operations of the campus.

**10.3.2 ADD:** "One Call" must be notified by phone and in writing at least 72 hours (3 business days) prior to digging to arrange and assist in the location of buried utilities in the field. (Dial 811). The Contractor shall mark the boundary of the work area. The boundary area shall be indicated with white paint and white flags. In winter, pink paint and flags will be accepted.

**10.3.3 ADD:** After buried utilities have been located, the Contractor shall be responsible for any utilities damaged while digging. Such responsibility shall include all necessary care including hand digging. Contractor's responsibility shall also include maintaining markings after initial locate. The area for such responsibility, unless otherwise indicated, shall extend 24 inches to either side of the marked center line of a buried utility line. In cases of multiple or overlapping utilities or inconclusive electronic locating signals, MSU Project Manager may specifically indicate a wider area for Contractor's responsibility.

**10.3.4 ADD:** The Contractor's responsibility shall include repair or replacement of damaged utilities. In the event of damage to the 15 KV electrical distribution system, the broadband or fiber optic cables, repair will consist of replacement from termination to termination. Facilities Services and the MSU Information Technology Center will verify repair and recertification. The Contractor will also be responsible for all costs associated with re-terminations and recertification.

**10.3.5 ADD:** Any buried utilities exposed by the operations of the Contractor shall be marked on the plans and adequately protected by the Contractor. If any buried utilities not located are exposed, the Contractor shall immediately contact Facilities Services at the numbers above. If, after exposing an unlocated buried utility, the Contractor continues digging without notifying Facilities Services and further damages the utility, the Contractor will be responsible.

**10.3.6 ADD:** Damage to irrigation systems during seasons of no irrigation that are not immediately and adequately repaired and tested will require the Contractor to return when the system is in service to complete the repair.

**10.3.7 ADD:** In the event of a planned interruption of any existing utility service, the Contractor shall make arrangements with Facilities Services at least 72 hours (3 business days) in advance. Shutdowns of the broadband or fiber optic cables will normally require 5 working days notice to Facilities Services and the Information Technology Center. The Contractor shall bear all costs associated with the interruptions and restorations of service.

**10.3.8 ADD:** The Owner allows the contractor to use the Owner's utilities (water, heat, electricity) services without charge for procedures necessary for the completion of the work.

## **ARTICLE 11 - INSURANCE AND BONDS**

### **11.4. COMMERCIAL GENERAL LIABILITY INSURANCE**

**11.4.1.3. Insert** in the first line after "State of Montana": ", Montana State University".

### **11.7. PERFORMANCE BOND AND LABOR & MATERIAL PAYMENT BOND (BOTH ARE REQUIRED ON THIS PROJECT)**

**11.7.1.** Insert in the first line at the beginning of the sentence "For contracts equal to or greater than \$150,000".

## **11.8. CANCELLATION**

**11.8 ADD** All Certificates shall contain a provision that coverage provided by the policies will not be cancelled without at least thirty (30) days prior notice to the Owner.

## **ARTICLE 13 – MISCELLANEOUS PROVISIONS**

### **13.1. GOVERNING LAW**

**13.1.1. Insert** in the second line “The Eighteenth Judicial District, Gallatin County” in lieu of “First Judicial District, Lewis and Clark County”.

### **13.9 EMERGENCY AND PUBLIC SAFETY**

Montana State University has an Emergency and Public Safety Alert System that warns the campus community in the event of an emergency or public safety event. Because contractors, consultants, and vendors are considered members of the campus community when working on campus, they must be familiar with the alert system and understand when the system is used. Montana State University requires all contractors, consultants, vendors, and their employees working on or entering the MSU-Bozeman campus to register for the Emergency and Public Safety Alert System. The link to register is: <http://www.montana.edu/msualert/>.

**END OF SUPPLEMENTARY GENERAL CONDITIONS**

## **Cost Estimate to Re-key Buildings**

Access to campus buildings is controlled for safety and security reasons. As a key holder the contractor is responsible for following processes associated with maintaining the integrity of our access control program. If a key is lost the contractor is liable for costs associated with ensuring access control is maintained. In some cases that requires re-keying an entire building or key sequence. Cost can range from \$2,000 to over \$200,000 depending on building and key hierarchy.

MONTANA  
PREVAILING WAGE RATES FOR BUILDING CONSTRUCTION SERVICES 2023

**Effective: January 14, 2023**

*Greg Gianforte, Governor  
State of Montana*

*Laurie Esau, Commissioner  
Department of Labor & Industry*

To obtain copies of prevailing wage rate schedules, or for information relating to public works projects and payment of prevailing wage rates, visit ERD at [erd.dli.mt.gov/labor-standards](http://erd.dli.mt.gov/labor-standards) or contact:

Employment Standards Division  
Montana Department of Labor and Industry  
P. O. Box 8011  
Helena, MT 59601  
Phone 406-444-6543

**The department welcomes questions, comments, and suggestions from the public. In addition, we'll do our best to provide information in an accessible format, upon request, in compliance with the Americans with Disabilities Act.**

**MONTANA PREVAILING WAGE REQUIREMENTS**

The Commissioner of the Department of Labor and Industry, in accordance with Sections 18-2-401 and 18-2-402 of the Montana Code Annotated (MCA), has determined the standard prevailing rate of wages for the occupations listed in this publication.

The wages specified herein control the prevailing rate of wages for the purposes of Section 18-2-401, et seq., MCA. It is required each employer pay (as a minimum) the rate of wages, including fringe benefits, travel allowance, zone pay and per diem applicable to the district in which the work is being performed as provided in the attached wage determinations.

All Montana Prevailing Wage Rates are available on the internet at [erd.dli.mt.gov/labor-standards](http://erd.dli.mt.gov/labor-standards) or by contacting the department at (406) 444-6543.

In addition, this publication provides general information concerning compliance with Montana's Prevailing Wage Law and the payment of prevailing wages. For detailed compliance information relating to public works contracts and payment of prevailing wage rates, please consult the regulations on the internet at [erd.dli.mt.gov/labor-standards](http://erd.dli.mt.gov/labor-standards) or contact the department at (406) 444-6543.

LAURIE ESAU  
Commissioner  
Department of Labor and Industry  
State of Montana



## TABLE OF CONTENTS

### MONTANA PREVAILING WAGE REQUIREMENTS:

A. Date of Publication .....	3
B. Definition of Building Construction .....	3
C. Definition of Public Works Contract .....	3
D. Prevailing Wage Schedule .....	3
E. Rates to Use for Projects .....	3
F. Wage Rate Adjustments for Multiyear Contracts .....	3
G. Fringe Benefits .....	4
H. Prevailing Wage Districts .....	4
I. Dispatch City .....	5
J. Zone Pay .....	5
K. Computing Travel Benefits .....	5
L. Per Diem .....	5
M. Apprentices .....	5
N. Posting Notice of Prevailing Wages .....	5
O. Employment Preference .....	5
P. Projects of a Mixed Nature .....	6
Q. Occupations Definitions Website .....	6
R. Welder Rates .....	6
S. Foreman Rates .....	6

### WAGE RATES:

BOILERMAKERS .....	7
BRICK, BLOCK, AND STONE MASONS .....	7
CARPENTERS .....	7
CARPET INTALLERS .....	7
CEMENT MASONS AND CONCRETE FINISHERS .....	8
CONSTRUCTION EQUIPMENT OPERATORS	
OPERATORS GROUP 1 .....	8
OPERATORS GROUP 2 .....	9
OPERATORS GROUP 3 .....	9
OPERATORS GROUP 4 .....	10
OPERATORS GROUP 5 .....	10
OPERATORS GROUP 6 .....	10
OPERATORS GROUP 7 .....	11
CONSTRUCTION LABORERS	
LABORERS GROUP 1 .....	11
LABORERS GROUP 2 .....	11
LABORERS GROUP 3 .....	12
LABORERS GROUP 4 .....	12
DRYWALL APPLICATORS .....	12
ELECTRICIANS: INCLUDING BUILDING AUTOMATION CONTROL .....	13
ELEVATOR CONSTRUCTORS .....	13
FLOOR LAYERS .....	14
GLAZIERS .....	14
HEATING AND AIR CONDITIONING .....	14
INSULATION WORKERS - MECHANICAL (HEAT AND FROST) .....	14
IRONWORKERS - REINFORCING IRON AND REBAR WORKERS .....	15
IRONWORKERS - STRUCTURAL IRON AND REBAR WORKERS .....	15
MILLWRIGHTS .....	15
PAINTERS: INCLUDING PAPERHANGERS .....	16
PILE BUCKS .....	16
PILOT CAR DRIVERS .....	16
PLASTERERS .....	16
PLUMBERS, PIPEFITTERS, AND STEAMFITTERS .....	17
ROOFERS .....	18
SHEET METAL WORKERS .....	18
SOLAR PHOTOVOLTAIC INSTALLERS .....	19
SPRINKLER FITTERS .....	19
TAPERS .....	20
TELECOMMUNICATIONS EQUIPMENT INSTALLERS .....	21
TERRAZZO WORKERS AND FINISHERS .....	21
TILE AND STONE SETTERS .....	21
TRUCK DRIVERS .....	22

## **A. Date of Publication January 14, 2023**

## **B. Definition of Building Construction**

For the purposes of Prevailing Wage, the Commissioner of Labor and Industry has determined that building construction occupations are defined to be those performed by a person engaged in a recognized trade or craft, or any skilled, semi-skilled, or unskilled manual labor related to the construction, alteration, or repair of a public building or facility, and does not include engineering, superintendence, management, office or clerical work.

The Administrative Rules of Montana (ARM), 24.17.501(2) – 2(a), states *“Building construction projects generally are the constructions of sheltered enclosures with walk-in access for housing persons, machinery, equipment, or supplies. It includes all construction of such structures, incidental installation of utilities and equipment, both above and below grade level, as well as incidental grading, utilities and paving.”*

*Examples of building construction include, but are not limited to, alterations and additions to buildings, apartment buildings (5 stories and above), arenas (closed), auditoriums, automobile parking garages, banks and financial buildings, barracks, churches, city halls, civic centers, commercial buildings, court houses, detention facilities, dormitories, farm buildings, fire stations, hospitals, hotels, industrial buildings, institutional buildings, libraries, mausoleums, motels, museums, nursing and convalescent facilities, office buildings, out-patient clinics, passenger and freight terminal buildings, police stations, post offices, power plants, prefabricated buildings, remodeling buildings, renovating buildings, repairing buildings, restaurants, schools, service stations, shopping centers, stores, subway stations, theaters, warehouses, water and sewage treatment plants (buildings only), etc.”*

## **C. Definition of Public Works Contract**

Section 18-2-401(11)(a), MCA defines “public works contract” as *“...a contract for construction services let by the state, county, municipality, school district, or political subdivision or for nonconstruction services let by the state, county, municipality, or political subdivision in which the total cost of the contract is in excess of \$25,000...”*.

## **D. Prevailing Wage Schedule**

This publication covers only Building Construction occupations and rates. These rates will remain in effect until superseded by a more current publication. Current prevailing wage rate schedules for Heavy Construction, Highway Construction, and Nonconstruction Services occupations can be found on the internet at [www.mtwagehoubopa.com](http://www.mtwagehoubopa.com) or by contacting the department at (406) 444-6543.

## **E. Rates to Use for Projects**

ARM, 24.17.127(1)(c), states *“The wage rates applicable to a particular public works project are those in effect at the time the bid specifications are advertised.”*

## **F. Wage Rate Adjustments for Multiyear Contracts**

Section 18-2-417, MCA states:

*“(1) Any public works contract that by the terms of the original contract calls for more than 30 months to fully perform must include a provision to adjust, as provided in subsection (2), the standard prevailing rate of wages to be paid to the workers performing the contract.*

*(2) The standard prevailing rate of wages paid to workers under a contract subject to this section must be adjusted 12 months after the date of the award of the public works contract. The amount of the adjustment must be a 3% increase. The adjustment must be made and applied every 12 months for the term of the contract.*

*(3) Any increase in the standard rate of prevailing wages for workers under this section is the sole responsibility of the contractor and any subcontractors and not the contracting agency.”*

## G. Fringe Benefits

Section 18-2-412, MCA states:

*“(1) To fulfill the obligation...a contractor or subcontractor may:*

*(a) pay the amount of fringe benefits and the basic hourly rate of pay that is part of the standard prevailing rate of wages directly to the worker or employee in cash;*

*(b) make an irrevocable contribution to a trustee or a third person pursuant to a fringe benefit fund, plan, or program that meets the requirements of the Employee Retirement Income Security Act of 1974 or that is a bona fide program approved by the U. S. department of labor; or*

*(c) make payments using any combination of methods set forth in subsections (1)(a) and (1)(b) so that the aggregate of payments and contributions is not less than the standard prevailing rate of wages, including fringe benefits and travel allowances, applicable to the district for the particular type of work being performed.*

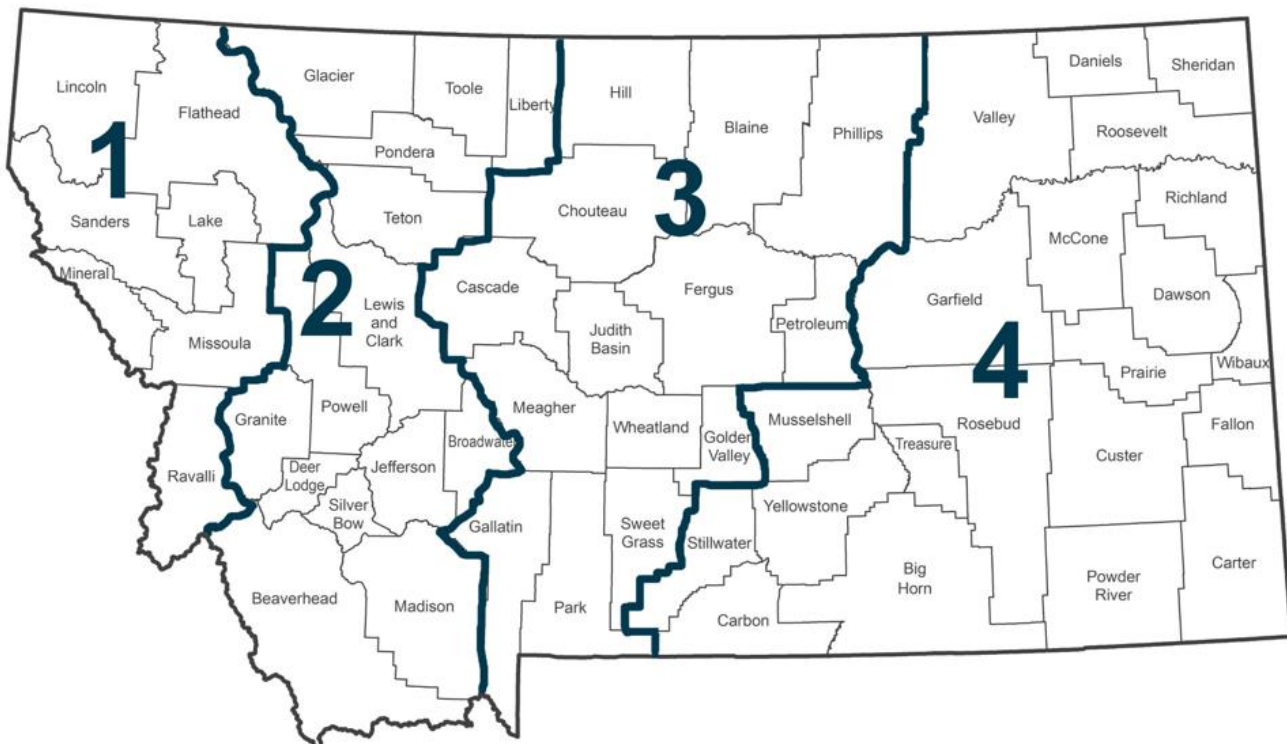
*(2) The fringe benefit fund, plan, or program described in subsection (1)(b) must provide benefits to workers or employees for health care, pensions on retirement or death, life insurance, disability and sickness insurance, or bona fide programs that meet the requirements of the Employee Retirement Income Security Act of 1974 or that are approved by the U. S. department of labor.”*

Fringe benefits are paid for all hours worked (straight time and overtime hours). However, fringe benefits are not to be considered a part of the hourly rate of pay for calculating overtime, unless there is a collectively bargained agreement in effect that specifies otherwise.

## H. Prevailing Wage Districts

Montana counties are aggregated into 4 districts for the purpose of prevailing wage. The prevailing wage districts are composed of the following counties:

### Montana Prevailing Wage Districts



## **I. Dispatch City**

ARM, 24.17.103(11), defines dispatch city as “...*the courthouse in the city from the following list which is closest to the center of the job: Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, Miles City, Missoula and Sidney.*” A dispatch city shall be considered the point of origin only for jobs within the counties identified in that district (as shown below):

**District 1 – Kalispell and Missoula:** includes Flathead, Lake, Lincoln, Mineral, Missoula, Ravalli, and Sanders;

**District 2 – Butte and Helena:** includes Beaverhead, Broadwater, Deer Lodge, Glacier, Granite, Jefferson, Lewis and Clark, Liberty, Madison, Pondera, Powell, Silver Bow, Teton, and Toole;

**District 3 – Bozeman and Great Falls:** includes Blaine, Cascade, Chouteau, Fergus, Gallatin, Golden Valley, Hill, Judith Basin, Meagher, Park, Petroleum, Phillips, Sweet Grass, and Wheatland;

**District 4 – Billings, Miles City and Sidney:** includes Big Horn, Carbon, Carter, Custer, Daniels, Dawson, Fallon, Garfield, McCone, Musselshell, Powder River, Prairie, Richland, Roosevelt, Rosebud, Sheridan, Stillwater, Treasure, Valley, Wibaux, and Yellowstone.

## **J. Zone Pay**

Zone pay is not travel pay. ARM, 24.17.103(25), defines zone pay as “...*an amount added to the base pay; the combined sum then becomes the new base wage rate to be paid for all hours worked on the project. Zone pay must be determined by measuring the road miles one way over the shortest practical maintained route from the dispatch city to the center of the job.*” See section I above for a list of dispatch cities.

## **K. Computing Travel Benefits**

ARM, 24.17.103(23), states “ ‘*Travel pay,*’ also referred to as ‘*travel allowance,*’ is and must be paid for travel both to and from the job site, except those with special provisions listed under the classification. The rate is determined by measuring the road miles one direction over the shortest practical maintained route from the dispatch city or the employee’s home, whichever is closer, to the center of the job.” See section I above for a list of dispatch cities.

## **L. Per Diem**

ARM, 24.17.103(19), states “ ‘*Per diem*’ typically covers costs associated with board and lodging expenses. *Per diem* is paid when an employee is required to work at a location outside the daily commuting distance and is required to stay at that location overnight or longer.”

## **M. Apprentices**

Wage rates for apprentices registered in approved federal or state apprenticeship programs are contained in those programs. Additionally, Section 18-2-416(2), MCA states “...*The full amount of any applicable fringe benefits must be paid to the apprentice while the apprentice is working on the public works contract.*” Apprentices not registered in approved federal or state apprenticeship programs will be paid the appropriate journey level prevailing wage rate when working on a public works contract.

## **N. Posting Notice of Prevailing Wages**

Section 18-2-406, MCA provides that contractors, subcontractors and employers who are “...*performing work or providing construction services under public works contracts, as provided in this part, shall post in a prominent and accessible site on the project or staging area, not later than the first day of work and continuing for the entire duration of the project, a legible statement of all wages and fringe benefits to be paid to the employees.*”

## **O. Employment Preference**

Sections 18-2-403 and 18-2-409, MCA requires contractors to give preference to the employment of bona fide Montana residents in the performance of work on public works contracts.

## **P. Projects of a Mixed Nature**

Section 18-2-408, MCA states:

*“(1) The contracting agency shall determine, based on the preponderance of labor hours to be worked, whether the public works construction services project is classified as a highway construction project, a heavy construction project, or a building construction project.*

*“(2) Once the project has been classified, employees in each trade classification who are working on that project must be paid at the rate for that project classification”*

## **Q. Occupations Definitions**

You can find definitions for these occupations on the following Bureau of Labor Statistics website:

[http://www.bls.gov/oes/current/oes\\_stru.htm](http://www.bls.gov/oes/current/oes_stru.htm)

## **R. Welder Rates**

Welders receive the rate prescribed for the craft performing an operation to which welding is incidental.

## **S. Foreman Rates**

Rates are no longer set for foremen. However, if a foreman performs journey level work, the foreman must be paid at least the journey level rate.

# WAGE RATES

## BOILERMAKERS

No Rate Established

**Duties Include:**

Construct, assemble, maintain, and repair stationary steam boilers, boiler house auxiliaries, process vessels, and pressure vessels.

[↑ Back to Table of Contents](#)

**Travel and Per Diem:**

**All Districts**

No travel or per diem established.

## BRICK, BLOCK, AND STONE MASONS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$32.32	\$16.78
District 2	\$32.32	\$16.78
District 3	\$32.32	\$16.78
District 4	\$32.32	\$16.78

[↑ Back to Table of Contents](#)

**Travel:**

**All Districts**

0-70 mi. free zone

>70-90 mi. \$60.00/day

>90 mi. \$80.00/day

## CARPENTERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$26.12	\$12.00
District 2	\$26.50	\$14.07
District 3	\$26.50	\$14.07
District 4	\$26.50	\$14.07

**Duties Include:**

Install roll and batt insulation, and hardwood floors.

[↑ Back to Table of Contents](#)

**Zone Pay:**

**All Districts**

0-30 mi. free zone

>30-60 mi. base pay + \$4.00/hr.

>60 mi. base pay + \$6.00/hr.

## CARPET INSTALLERS

No Rate Established

**Duties Include:**

Lay and install carpet from rolls or blocks on floors. Install padding and trim flooring materials.

[↑ Back to Table of Contents](#)

**Travel and Per Diem:**

**All Districts**

No travel or per diem established.

## CEMENT MASONS AND CONCRETE FINISHERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$24.00	\$8.85
District 2	\$22.63	\$7.36
District 3	\$21.17	\$3.67
District 4	\$20.57	\$3.67

### **Duties Include:**

Smooth and finish surfaces of poured concrete, such as floors, walks, sidewalks, or curbs. Align forms for sidewalks, curbs, or gutters.

[↑ Back to Table of Contents](#)

### **Travel and Per Diem:**

#### **All Districts**

No travel or per diem established.

## CONSTRUCTION EQUIPMENT OPERATORS GROUP 1

	<b>Wage</b>	<b>Benefit</b>
District 1	\$25.47	\$12.92
District 2	\$28.21	\$12.92
District 3	\$28.21	\$12.92
District 4	\$28.21	\$12.92

### **This group includes but is not limited to:**

Air Compressor; Auto Fine Grader; Belt Finishing; Boring Machine (Small); Cement Silo; Crane, A-Frame Truck Crane; Crusher Conveyor; DW-10, 15, and 20 Tractor Roller; Farm Tractor; Forklift; Form Grader; Front-End Loader, under 1 cu. yd; Oiler, Herman Nelson Heater; Mucking Machine; Oiler, All Except Cranes/Shovels; Pumpman.

[↑ Back to Table of Contents](#)

### **Zone Pay:**

#### **All Districts**

0-30 mi. free zone

>30-60 mi. base pay + \$3.50/hr.

>60 mi. base pay + \$5.50/hr.

## CONSTRUCTION EQUIPMENT OPERATORS GROUP 2

	<b>Wage</b>	<b>Benefit</b>
District 1	\$26.95	\$ 9.50
District 2	\$33.32	\$ 9.44
District 3	\$27.99	\$12.92
District 4	\$29.33	\$12.92

### **This group includes but is not limited to:**

Air Doctor; Backhoe\Excavator\Shovel, up to and incl. 3 cu. yds; Bit Grinder; Bituminous Paving Travel Plant; Boring Machine, Large; Broom, Self-Propelled; Concrete Travel Batcher; Concrete Float & Spreader; Concrete Bucket Dispatcher; Concrete Finish Machine; Concrete Conveyor; Distributor; Dozer, Rubber-Tired, Push, & Side Boom; Elevating Grader\Gradall; Field Equipment Serviceman; Front-End Loader, 1 cu. yd up to and incl. 5 cu. yds; Grade Setter; Heavy Duty Drills, All Types; Hoist\Tugger, All; Hydralift Forklifts & Similar; Industrial Locomotive; Motor Patrol (except finish); Mountain Skidder; Oiler, Cranes\Shovels; Pavement Breaker, EMSCO; Power Saw, Self-Propelled; Pugmill; Pumpcrete\Grout Machine; Punch Truck; Roller, other than Asphalt; Roller, Sheepsfoot (Self-Propelled); Roller, 25 tons and over; Ross Carrier; Rotomill, under 6 ft; Trenching Machine; Washing /Screening Plant.

[↑ Back to Table of Contents](#)

### **Zone Pay:**

#### **All Districts**

0-30 mi. free zone

>30-60 mi. base pay + \$3.50/hr.

>60 mi. base pay + \$5.50/hr.

## CONSTRUCTION EQUIPMENT OPERATORS GROUP 3

	<b>Wage</b>	<b>Benefit</b>
District 1	\$25.81	\$12.92
District 2	\$29.75	\$12.92
District 3	\$29.75	\$12.92
District 4	\$29.75	\$12.92

### **This group includes but is not limited to:**

Asphalt Paving Machine; Asphalt Screed; Backhoe\Excavator\Shovel, over 3 cu. yds; Cableway Highline; Concrete Batch Plant; Concrete Curing Machine; Concrete Pump; Cranes, Creter; Cranes, Electric Overhead; Cranes, 24 tons and under; Curb Machine\Slip Form Paver; Finish Dozer; Front-End Loader, over 5 cu. yds; Mechanic\Welder; Pioneer Dozer; Roller Asphalt (Breakdown & Finish); Rotomill, over 6 ft; Scraper, Single, Twin, or Pulling Belly-Dump; YO-YO Cat.

[↑ Back to Table of Contents](#)

### **Zone Pay:**

#### **All Districts**

0-30 mi. free zone

>30-60 mi. base pay + \$3.50/hr.

>60 mi. base pay + \$5.50/hr.



## CONSTRUCTION EQUIPMENT OPERATORS GROUP 4

	<b>Wage</b>	<b>Benefit</b>
District 1	\$26.70	\$12.92
District 2	\$29.62	\$14.21
District 3	\$30.75	\$12.92
District 4	\$30.75	\$12.92

**This group includes but is not limited to:**

Asphalt\Hot Plant Operator; Cranes, 25 tons up to and incl. 44 tons; Crusher Operator; Finish Motor Patrol; Finish Scraper.

[↑ Back to Table of Contents](#)

**Zone Pay:**

**All Districts**

0-30 mi. free zone

>30-60 mi. base pay + \$3.50/hr.

>60 mi. base pay + \$5.50/hr.

## CONSTRUCTION EQUIPMENT OPERATORS GROUP 5

	<b>Wage</b>	<b>Benefit</b>
District 1	\$31.75	\$12.92
District 2	\$31.75	\$12.92
District 3	\$30.33	\$15.08
District 4	\$31.75	\$12.92

**This group includes but is not limited to:**

Cranes, 45 tons up to and incl. 74 tons.

[↑ Back to Table of Contents](#)

**Zone Pay:**

**All Districts**

0-30 mi. free zone

>30-60 mi. base pay + \$3.50/hr.

>60 mi. base pay + \$5.50/hr.

## CONSTRUCTION EQUIPMENT OPERATORS GROUP 6

	<b>Wage</b>	<b>Benefit</b>
District 1	\$32.75	\$12.92
District 2	\$32.75	\$12.92
District 3	\$32.75	\$12.92
District 4	\$32.75	\$12.92

**This group includes but is not limited to:**

Cranes, 75 tons up to and incl. 149 tons; Cranes, Whirley (All).

[↑ Back to Table of Contents](#)

**Zone Pay:**

**All Districts**

0-30 mi. free zone

>30-60 mi. base pay + \$3.50/hr.

>60 mi. base pay + \$5.50/hr.

## CONSTRUCTION EQUIPMENT OPERATORS GROUP 7

	<b>Wage</b>	<b>Benefit</b>
District 1	\$33.75	\$12.92
District 2	\$33.75	\$12.92
District 3	\$33.75	\$12.92
District 4	\$33.75	\$12.92

**This group includes but is not limited to:**

Cranes, 150 tons up to and incl. 250 tons; Cranes, over 250 tons—add \$1.00 for every 100 tons over 250 tons; Crane, Tower (All); Crane Stiff-Leg or Derrick; Helicopter Hoist.

**Zone Pay:**

**All Districts**

0-30 mi. free zone

>30-60 mi. base pay + \$3.50/hr.

>60 mi. base pay + \$5.50/hr.

[↑ Back to Table of Contents](#)

## CONSTRUCTION LABORERS GROUP 1/FLAG PERSON FOR TRAFFIC CONTROL

	<b>Wage</b>	<b>Benefit</b>
District 1	\$23.55	\$11.82
District 2	\$23.55	\$11.82
District 3	\$23.55	\$11.82
District 4	\$23.55	\$11.82

**Zone Pay:**

**All Districts**

0-15 mi. free zone

>15-30 mi. base pay + \$0.65/hr.

>30-50 mi. base pay + \$0.85/hr.

>50 mi. base pay + \$1.25/hr.

[↑ Back to Table of Contents](#)

## CONSTRUCTION LABORERS GROUP 2

	<b>Wage</b>	<b>Benefit</b>
District 1	\$21.63	\$ 7.43
District 2	\$20.07	\$ 9.82
District 3	\$22.91	\$11.82
District 4	\$20.71	\$ 7.93

**Zone Pay:**

**All Districts**

0-15 mi. free zone

>15-30 mi. base pay + \$0.65/hr.

>30-50 mi. base pay + \$0.85/hr.

>50 mi. base pay + \$1.25/hr.

**This group includes but is not limited to:**

General Labor; Asbestos Removal; Burning Bar; Bucket Man; Carpenter Tender; Caisson Worker; Cement Mason Tender; Cement Handler (dry); Chuck Tender; Choker Setter; Concrete Worker; Curb Machine-lay Down; Crusher and Batch Worker; Heater Tender; Fence Erector; Landscape Laborer; Landscaper; Lawn Sprinkler Installer; Pipe Wrapper; Pot Tender; Powderman Tender; Rail and Truck Loaders and Unloaders; Riprapper; Sign Erection; Guardrail and Jersey Rail; Spike Driver; Stake Jumper; Signalman; Tail Hoseman; Tool Checker and Houseman and Traffic Control Worker.

[↑ Back to Table of Contents](#)

### CONSTRUCTION LABORERS GROUP 3

	<b>Wage</b>	<b>Benefit</b>
District 1	\$24.55	\$11.82
District 2	\$24.55	\$11.82
District 3	\$24.55	\$11.82
District 4	\$24.55	\$11.82

**This group includes but is not limited to:**

Concrete Vibrator; Dumpman (Grademan); Equipment Handler; Geotextile and Liners; High-Pressure Nozzleman; Jackhammer (Pavement Breaker) Non-Riding Rollers; Pipelayer; Posthole Digger (Power); Power Driven Wheelbarrow; Rigger; Sandblaster; Sod Cutter-Power and Tamper.

[↑ Back to Table of Contents](#)

**Zone Pay:**

**All Districts**

0-15 mi. free zone  
>15-30 mi. base pay + \$0.65/hr.  
>30-50 mi. base pay + \$0.85/hr.  
>50 mi. base pay + \$1.25/hr.

### CONSTRUCTION LABORERS GROUP 4

	<b>Wage</b>	<b>Benefit</b>
District 1	\$23.09	\$11.82
District 2	\$24.60	\$11.82
District 3	\$22.44	\$12.22
District 4	\$21.38	\$12.22

**This group includes but is not limited to:**

Hod Carrier\*\*\*; Water Well Laborer; Blaster; Wagon Driller; Asphalt Raker; Cutting Torch; Grade Setter; High-Scaler; Power Saws (Faller & Concrete) Powderman; Rock & Core Drill; Track or Truck Mounted Wagon Drill and Welder incl. Air Arc.

[↑ Back to Table of Contents](#)

**Zone Pay:**

**All Districts**

0-15 mi. free zone  
>15-30 mi. base pay + \$0.65/hr.  
>30-50 mi. base pay + \$0.85/hr.  
>50 mi. base pay + \$1.25/hr.

\*\*\*Hod Carriers will receive the same amount of travel and/or subsistence pay as bricklayers when requested to travel.

### DRYWALL APPLICATORS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$26.50	\$14.07
District 2	\$26.50	\$14.07
District 3	\$26.50	\$14.07
District 4	\$26.50	\$14.07

**Duties Include:**

Drywall and ceiling tile installation.

[↑ Back to Table of Contents](#)

**Zone Pay:**

**All Districts**

0-30 mi. free zone  
>30-60 mi. base pay + \$4.00/hr.  
>60 mi. base pay + \$6.00/hr.

## ELECTRICIANS: INCLUDING BUILDING AUTOMATION CONTROL

	<b>Wage</b>	<b>Benefit</b>
District 1	\$33.22	\$15.91
District 2	\$32.18	\$16.93
District 3	\$32.56	\$14.56
District 4	\$36.69	\$15.98

### **Duties Include:**

Electrical wiring; equipment and fixtures; street lights; electrical control systems. Installation and/or adjusting of building automation controls also during testing and balancing, commissioning and retro-commissioning.

### **Travel:**

#### **District 1**

No mileage due when traveling in employer's vehicle.

The following travel allowance is applicable when traveling in employee's vehicle:

- 0-15 mi. free zone
- >15-45 mi. \$0.625/mi. in excess of the free zone
- >45 mi. \$75.00/day

#### **Districts 2 and 3**

No mileage due when traveling in employer's vehicle.

The following travel allowance is applicable when traveling in employee's vehicle:

- 0-08 mi. free zone
- >08-50 mi. federal mileage rate/mi. in excess of the free zone.
- >50 mi. \$71.57/day

#### **District 4**

No mileage due when traveling in employer's vehicle.

The following travel allowance is applicable when traveling in employee's vehicle:

- 0-18 mi. free zone
- >18-60 mi. federal mileage rate/mi.
- >60 mi. \$75.00/day

[↑ Back to Table of Contents](#)

## ELEVATOR CONSTRUCTORS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$59.70	\$44.11
District 2	\$59.70	\$44.11
District 3	\$59.70	\$44.11
District 4	\$59.70	\$44.11

### **Travel:**

#### **All Districts**

- 0-15 mi. free zone
- >15-25 mi. \$47.85/day
- >25-35 mi. \$95.70/day
- >35 mi. \$104.54/day or cost of receipts for hotel and meals, whichever is greater.

#### **Special Provision:**

When in employees vehicle additional reimbursement of 1.5% of the prevailing wage rate is added to the amounts above.

[↑ Back to Table of Contents](#)

## FLOOR LAYERS

### No Rate Established

Apply blocks, strips, or sheets of shock-absorbing, sound-deadening, or decorative coverings to floors.

[↑ Back to Table of Contents](#)

### Travel and Per Diem:

#### All Districts

No travel or per diem established.

## GLAZIERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$21.44	\$4.01
District 2	\$21.88	\$4.29
District 3	\$22.31	\$3.99
District 4	\$22.04	\$3.87

[↑ Back to Table of Contents](#)

### Travel and Per Diem:

#### All Districts

No travel or per diem established.

## HEATING AND AIR CONDITIONING

	<b>Wage</b>	<b>Benefit</b>
District 1	\$33.00	\$20.73
District 2	\$33.00	\$20.73
District 3	\$33.00	\$20.73
District 4	\$33.00	\$20.73

### Duties Include:

Testing and balancing, commissioning and retro-commissioning of all air-handling equipment and duct work.

[↑ Back to Table of Contents](#)

### Travel:

#### All Districts

0-50 mi. free zone

>50 mi.

- \$0.25/mi. in employer vehicle.
- \$0.65/mi. in employee vehicle.

### Per Diem:

#### All Districts

\$85/day

## INSULATION WORKERS - MECHANICAL (HEAT AND FROST)

	<b>Wage</b>	<b>Benefit</b>
District 1	\$39.37	\$19.87
District 2	\$39.37	\$19.87
District 3	\$39.37	\$19.87
District 4	\$39.37	\$19.87

### Duties Include:

Insulate pipes, ductwork or other mechanical systems.

[↑ Back to Table of Contents](#)

### Travel:

#### All Districts

0-30 mi. free zone

>30-40 mi. \$25.00/day

>40-50 mi. \$35.00/day

>50-60 mi. \$50.00/day

>60 mi. \$60.00/day plus

- \$0.56/mi. if transportation is not provided.
  - \$0.20/mi. if in company vehicle.
- >60 mi. \$105.00/day on jobs requiring an overnight stay plus
- \$0.56/mi. if transportation is not provided.
  - \$0.20/mi. if in company vehicle.

## IRONWORKERS – REINFORCING IRON AND REBAR WORKERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$30.53	\$27.91
District 2	\$29.54	\$24.49
District 3	\$29.54	\$24.49
District 4	\$29.54	\$24.99

### **Duties Include:**

Cut, bend, tie, and place rebar.

### **Travel:**

#### **District 1**

0-45 mi. free zone  
>45-60 mi. \$50.00/day  
>60-100 mi. \$75.00/day  
>100 mi. \$95.00/day

### **Special Provision:**

When the employer provides transportation, travel will not be paid. However, when an employee is required to travel over 70 miles one way, the employee may elect to receive the travel pay in lieu of the transportation.

#### **Districts 2, 3 & 4**

0-45 mi. free zone  
>45-85 mi. \$70.00/day  
>85 mi. \$100.00/day

[↑ Back to Table of Contents](#)

## IRONWORKERS – STRUCTURAL IRON AND STEEL WORKERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$30.53	\$27.91
District 2	\$29.54	\$24.49
District 3	\$29.54	\$24.49
District 4	\$29.54	\$24.49

### **Duties Include:**

Structural steel erection; assemble prefabricated metal buildings; energy producing windmill type towers; metal bleacher seating; handrail fabrication and ornamental steel.

### **Travel:**

#### **District 1**

0-45 mi. free zone  
>45-60 mi. \$50.00/day  
>60-100 mi. \$75.00/day  
>100 mi. \$95.00/day

### **Special Provision:**

When the employer provides transportation, travel will not be paid. However, when an employee is required to travel over 70 miles one way, the employee may elect to receive the travel pay in lieu of the transportation.

#### **Districts 2, 3 & 4**

0-45 mi. free zone  
>45-85 mi. \$70.00/day  
>85 mi. \$100.00/day

[↑ Back to Table of Contents](#)

## MILLWRIGHTS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$42.43	\$14.52
District 2	\$42.43	\$14.52
District 3	\$42.43	\$14.52
District 4	\$42.43	\$14.52

### **Zone Pay:**

#### **All Districts**

0-30 mi. free zone  
>30-60 mi. base pay + \$4.00/hr.  
>60 mi. base pay + \$6.00/hr.

[↑ Back to Table of Contents](#)

## PAINTERS: INCLUDING PAPERHANGERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$24.20	\$7.61
District 2	\$23.10	\$7.61
District 3	\$22.59	\$8.31
District 4	\$22.56	\$7.37

[↑ Back to Table of Contents](#)

### **Travel and Per Diem:**

#### **All Districts**

No travel or per diem established.

## PILE BUCKS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$33.50	\$14.07
District 2	\$33.50	\$14.07
District 3	\$33.50	\$14.07
District 4	\$33.50	\$14.07

### **Duties Include:**

Set up crane; set up hammer; weld tips on piles; set leads; insure piles are driven straight with the use of level or plum bob. Give direction to crane operator as to speed and direction of swing. Cut piles to grade.

[↑ Back to Table of Contents](#)

### **Zone Pay:**

#### **All Districts**

0-30 mi. free zone

>30-60 mi. base pay + \$4.00/hr.

>60 mi. base pay + \$6.00/hr.

## PILOT CAR DRIVERS

### **No Rate Established**

[↑ Back to Table of Contents](#)

### **Zone Pay:**

#### **All Districts**

No zone pay established.

## PLASTERERS

### **No Rate Established**

### **Duties Include:**

All materials beyond the substrate, such as a moisture barrier, any type of drainage installation between the moisture barrier and insulation or EPS board, the attachment of the EPS board, installation of fiberglass mesh embedded in the base coat, any water-resistant coat that is applied on top of the insulation to serve as a weather barrier, and the application of the finish coat.

[↑ Back to Table of Contents](#)

### **Travel and Per Diem:**

#### **All Districts**

No travel or per diem established.

## PLUMBERS, PIPEFITTERS, AND STEAMFITTERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$36.13	\$16.01
District 2	\$37.90	\$16.45
District 3	\$37.90	\$16.45
District 4	\$35.21	\$20.21

### **Duties Include:**

Assemble, install, alter, and repair pipe-lines or pipe systems that carry water, steam, air, other liquids or gases. Testing of piping systems, commissioning and retro-commissioning. Workers in this occupation may also install heating and cooling equipment and mechanical control systems.

### **Travel:**

#### **District 1**

0-30 mi. free zone  
>30-50 mi. \$35.00/day  
>50-75 mi. \$45.00/day  
>75 mi. \$100.00/day

#### **Special Provision**

If transportation is not provided, mileage at \$0.35/mi. for one trip out and one trip back is added to the amounts above. However, if the employee is traveling more than 75 miles/day, only subsistence at the rate of \$85.00/day is required.

#### **Districts 2 & 3**

0-45 mi. free zone  
>45 mi.

- \$0.00/mi. in employer vehicle.
- \$0.65/mi. in employee vehicle.

#### **Special Provision:**

At the contractors' option, mileage for one trip out and one trip back per week may be paid plus subsistence at the rate of \$135.00/day.

#### **District 4**

0-70 free zone  
>70 mi.

- On jobs when employees do not work consecutive days: \$0.55/mi. if employer doesn't provide transportation. Not to exceed two trips.
- On jobs when employees work any number of consecutive days: \$110.00/day.

[↑ Back to Table of Contents](#)



## ROOFERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$28.22	\$13.01
District 2	\$23.01	\$10.41
District 3	\$23.01	\$10.41
District 4	\$23.00	\$ 9.16

### **Duties Include:**

Metal roofing, covers roofs, walls and foundations with water proofing, insulation and vapor barriers in addition to metal flashings. Roofing includes shingles, low slope membranes, metal roofs, insulation, spray foam, coatings and vapor barriers. Wall coverings include metal panels, insulated metal panels and other waterproofing or rain screen systems. Foundation systems include waterproofing and insulation. Excludes prefabricated metal buildings.

### **Travel:**

#### **District 1**

0-50 mi. free zone  
>50 mi. \$0.35/mi.

#### **District 2 and 3**

0-35 mi. free zone  
>35 mi. \$0.35/mi only when employer doesn't provide transportation in excess of the free zone.

#### **District 4**

0-50 mi. free zone  
>50 mi. \$0.35/mi only when employer doesn't provide transportation.

### **Per Diem:**

#### **District 1**

\$74.00/day

#### **District 2 and 3**

Employer pays for room + \$26.50/day.

#### **District 4**

Employer pays for room + \$26.50/day.  
or  
\$66.00/day.

[↑ Back to Table of Contents](#)

## SHEET METAL WORKERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$33.00	\$20.73
District 2	\$33.00	\$20.73
District 3	\$33.00	\$20.73
District 4	\$33.00	\$20.73

### **Duties Include:**

Testing and balancing, commissioning and retro-commissioning of all air-handling equipment and duct work. Manufacture, fabrication, assembling, installation, dismantling, and alteration of all HVAC systems, air conveyer systems, and exhaust systems. All lagging over insulation and all duct lining.

### **Travel:**

#### **All Districts**

0-50 mi. free zone  
>50 mi.

- \$0.25/mi. in employer vehicle.
- \$0.65/mi. in employee vehicle.

### **Per Diem:**

#### **All Districts**

\$85/day

[↑ Back to Table of Contents](#)

## SOLAR PHOTOVOLTAIC INSTALLERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$33.22	\$15.91
District 2	\$33.25	\$16.93
District 3	\$33.25	\$15.67
District 4	\$33.25	\$15.67

### Travel:

#### District 1

No mileage due when traveling in employer's vehicle.

The following travel allowance is applicable when traveling in employee's vehicle:

- 0-15 mi. free zone
- >15-45 mi. \$0.625/mi. in excess of the free zone
- >45 mi. \$75.00/day

#### Districts 2, 3, and 4

No mileage due when traveling in employer's vehicle.

The following travel allowance is applicable when traveling in employee's vehicle:

- 0-08 mi. free zone
- >08-50 mi. federal mileage rate/mi. in excess of the free zone.
- >50 mi. \$71.57/day

[↑ Back to Table of Contents](#)

## SPRINKLER FITTERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$38.66	\$24.29
District 2	\$37.96	\$24.29
District 3	\$38.66	\$24.29
District 4	\$35.66	\$24.29

### Duties Include:

Duties Include but not limited to any and all fire protection systems: Installation, dismantling, inspection, testing, maintenance, repairs, adjustments, and corrections of all fire protection and fire control systems, including both overhead and underground water mains, all piping, fire hydrants, standpipes, air lines, tanks, and pumps used in connection with sprinkler and alarm systems.

### Travel

#### All Districts

The following travel allowance is applicable when traveling in employee's vehicle.

- 0-60 mi. free zone
- >60-80 mi. \$21.00/day
- >80-100 mi. \$31.00/day
- >100 mi. \$115.00/day + the IRS rate per mile and \$8.92 for every 15 miles traveled for one trip out and one trip back

No travel allowance required when in employer's vehicle.

#### Per Diem

No per diem is applicable when traveling in employer's vehicle

The following per diem is applicable when traveling in employee's vehicle.

- 0-100 mi. free zone
- >100 mi. \$105.00/day + the IRS rate per mile and \$8.92 for every 15 miles traveled for one trip out and one trip back.
- >100 mi. \$115.00/day

[↑ Back to Table of Contents](#)

## TAPERS

No Rate Established

[↑ Back to Table of Contents](#)

**Travel and Per Diem:**

**All Districts**

No travel or per diem established.

## TELECOMMUNICATIONS EQUIPMENT INSTALLERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$25.84	\$ 3.14
District 2	\$24.60	\$11.00
District 3	\$24.60	\$11.08
District 4	\$21.25	\$11.08

**Duties Include:**

Install voice; sound; vision and data systems. This occupation includes burglar alarms, fire alarms, fiber optic systems, and video systems for security or entertainment

[↑ Back to Table of Contents](#)

**Travel:**

**All Districts**

The federal mileage rate/mi. in effect when travel occurs if using own vehicle.

**Per Diem:**

**All Districts**

\$75.00/day.

## TERRAZZO WORKERS AND FINISHERS

No Rate Established

**Duties Include:**

Finish work on hard tile, marble, and wood tile to floors, ceilings, and roof decks

[↑ Back to Table of Contents](#)

**Travel and Per Diem:**

**All Districts**

No travel or per diem established.

## TILE AND STONE SETTERS

No Rate Established

**Duties Include:**

Apply hard tile, stone, and comparable materials to walls, floors, ceilings, countertops, and roof decks.

[↑ Back to Table of Contents](#)

**Travel and Per Diem:**

**All Districts**

No travel or per diem established.

## TRUCK DRIVERS

	<b>Wage</b>	<b>Benefit</b>
District 1	\$22.67	\$5.82
District 2	\$23.80	\$6.13
District 3	\$23.80	\$6.13
District 4	\$23.80	\$6.13

### **Truck drivers include but are not limited to:**

Combination Truck & Concrete Mixer; Distributor Driver; Dry Batch Trucks; Dump Trucks & Similar Equipment; Flat Trucks; Lowboys, Four-Wheel Trailers, Float Semitrailer; Powder Truck Driver (Bulk Unloader Type); Servicemen; Service Truck Drivers, Fuel Truck Drivers, Tiremen; Trucks with Power Equipment; Truck Mechanic; Water Tank Drivers, Petroleum Product Drivers.

**Zone Pay:**  
**All Districts**  
No zone pay established.

[↑ Back to Table of Contents](#)

## SECTION 011000 SUMMARY

### 1.1 PART 1 - GENERAL

- A. Related Documents
  - 1. Drawings and general provisions of Contract, including General Conditions, Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.
  
- B. Project Description
  - 1. Replacement of cold chamber evaporative cooling tower with adiabatic style fluid cooler.
  
- C. Site Information
  - 1. Scope of work includes, but is not limited to, roofing, structural steel, mechanical equipment, piping and controls located in the Mechanical Penthouse and adjacent roof area.
  
- D. Contracts
  - 1. Contracts shall be under one General Contract and shall include, but not be limited to, all labor, materials, and supervision necessary to furnish and install the Work.
  
- E. Work Sequence
  - 1. The work will be conducted in two phases to provide the least possible interference to the activities of the Owner's personnel and activities. The existing system and controls must remain operational throughout construction with very limited shutdowns which must be coordinated in advance with the Owner, Engineer and building occupants. The existing system shall be demolished as indicated on the documents following a 90 day run period with the replacement system.
  - 2. The Contractor will have access to the roof and mechanical penthouse within 30 days from the date of receipt of the contract.
  
- F. Contractor Use of Premises
  - 1. Work on this contract is expected to be done during regular working hours Monday through Friday. Any variation from this will require prior approval of the Consultant and Owner.
  - 2. All work must be coordinated with MSU at all times and MSU must be informed about any work impacting campus operations 72 hours or 3 working days in advance of work being conducted and shall require MSU approval.
  - 3. General: Limit use of the premises to construction activities in areas indicated; allow for Owner/MSU occupancy and use by the public. Confine operations to areas within contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
  - 4. Contractor shall conduct all his work in such a manner as to minimize the inconvenience and disruption of MSU's daily schedule.

- equipment.
5. Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project construction.
  6. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials to the areas designated on the drawings. If additional storage is necessary, obtain and pay for such storage off-site.
  7. Contractor shall establish a staging area for storage of materials and
  8. The Contractor is to coordinate with MSU for the location of the job site trailer office.
  9. Keep driveways and entrances serving the premises clear and available to MSU and MSU's employees, staff and visitors at all times, unless otherwise agreed by MSU. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

G. Parking and Site Access

***(See also Supplemental Conditions of the Contract for Construction.)***

1. MSU Bozeman Vehicle Regulations state: "All students, faculty, staff, and visitors must register any motor vehicle they park on the University campus, for any reason. A visitor is anyone not defined as student, staff or faculty."
2. All Contractor and Contractor employees shall comply with Montana State University parking regulations. MSU parking permits can be purchased at the University Police Office located in the Huffman Building at Seventh Avenue and Kagy Boulevard. Violators of MSU Bozeman Vehicle Regulations may be ticketed and towed.
3. A maximum of three (3) Contractor Permits (or as agreed with MSU) will be made available to the Contractor for parking of essential vehicles within the designated parking lot (as designated on the Cover Sheet of the Contract Documents). Essential vehicles are vehicles used for delivery of equipment and tools required to be parked in close proximity to the construction area. All allowed vehicles only to be parked on hard surfaced areas within the Staging Area. All other Contractor and Contractor employee vehicles on campus shall be parked in designated parking lots to be agreed with MSU. No personal vehicles shall be parked at the project site in any event. If a driver of a vehicle not allowed to be parked at the project site must unload equipment, tools, or materials, the vehicle must be immediately thereafter move to a designated lot or leave campus.
4. Access and egress to and from the project site shall be coordinated with the owner. In cases where a different route must be used for a specific purpose, permission must be obtained from MSU. Access routes are for delivery of equipment, tools, and materials and not for parking.
5. The site Staging Areas for materials and equipment are designated on the Cover Sheet of the Contract Documents. Staged materials and equipment must be secured on the ground surface or in trailers. Site staging areas shall be fenced in accordance with the Contract Documents. Vehicles in addition to those allowed to be parked may not be used for staging of equipment, tools, or materials.

## H. Owner Occupancy

1. Full Owner/MSU Occupancy: The Owner/MSU will occupy the site during the entire construction period. Cooperate with MSU during construction operations to minimize conflicts and facilitate MSU usage. Perform the work so as not to interfere with MSU's operations.

## I. Safety Requirements

1. General: The safety measures required by the Contract Documents are not meant to be inclusive. The Contractor shall be solely responsible for safety on a 24-hours-per-day, 7 days-per-week basis and shall take whatever additional measures are necessary to insure the health and safety of the buildings' occupants, or pedestrians at or near the construction site and access routes and of all other persons in all areas affected by the Contractor's activities. Prior to the start of construction, the Contractor is to submit to the Consultant, a detailed written plan specifying the safety procedures that will be followed. Include (but not by way of limitation) the following: Verbiage, size and locations of warning signs; construction sequence as related to safety; use of barricades (type and location); employee policies as related to safety; and delivery of materials as related to safety. Revise the safety plan as required during construction and resubmit to the Owner.
2. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
3. Comply with Federal, State, local, and the Owner's fire, health and safety requirements.
4. Advise MSU whenever work is expected to be hazardous or inconvenient (including objectionable odors) to MSU's employees, students, visitors or the building occupants.
5. Construction materials or equipment shall be placed so as not to endanger the work or prevent free access to all emergency devices or utility disconnects.
6. Maintain the proper rated fire extinguishers within easy access where power tools, sanding or other equipment is being used.
7. The Contractor shall erect and maintain, as required by law, conditions and progress of the work, warning signs, barricades and other reasonable safeguards for safety and protection.
8. **Emergency and Public Safety Alert System:**  
Montana State University has an Emergency and Public Safety Alert System that warns the campus community in the event of an emergency or public safety event. Because contractors, consultants, and vendors are considered members of the campus community when working on campus, they must be familiar with the alert system and understand when the system is used. Montana State University requires all contractors, consultants, vendors, and their employees working on or entering the MSU-Bozeman campus to register for the Emergency and Public Safety Alert System. The link to register is:  
<http://www.montana.edu/msualert/>

## J. Existing Premises Condition

1. The Contractor is responsible for adequately documenting in photos the existing condition of the premises, to include external road surfaces, curbing and landscaped areas, specifically the cleanliness of areas. Any damage to the premises which is found after construction and is not so documented will be the responsibility of the Contractor to repair or replace.

K. Discrepancies in the Documents

1. The Contractor shall bring any discrepancies between any portions of the drawings and specifications to the attention of the Owner and the Consultant in writing. The Owner and Consultant shall review the discrepancy and clarify the intent desired in the Contract Documents. Unless specifically directed otherwise, the Contractor shall be obligated to provide the greater quantity or quality without any change in contract sum or time.

END OF SECTION 011000



**SECTION 012000  
PRICE AND PAYMENT  
PROCEDURES**

1.1 GENERAL

A. Related Documents

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

B. Summary

1. This Section specified administrative and procedural requirements governing the Contractor's Applications for Payment.
2. The Contractor's Construction Schedule and Submittal Schedule are included in Section "Submittals".

C. Schedule of Values

1. Coordinate preparation of the Schedule of Values, Form 100, with preparation of the Contractor's Construction Schedule.
2. Each prime Contractor shall coordinate preparation of its Schedule of Values for its part of the work with preparation of the Contractor's Construction Schedule.
3. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
  - a. Contractor's construction schedule
  - b. Application for Payment form
  - c. List of subcontractors
  - d. Schedule of allowances
  - e. Schedule of alternates
  - f. List of products
  - g. List of principal suppliers and fabricators
  - h. Schedule of submittals
  - i. Submit the Schedule of Values to the Architect at the earliest feasible date, but in no case later than seven (7) days before the date scheduled for submittal of the initial Application for Payment.
  - j. Sub-Schedules: Where the work is separated into phases that require separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
4. Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.
  - a. Identification: Include the following project identification on the Schedule of Values:
    - 1) Project name
    - 2) Name of the Architect
    - 3) Project number (PPA No.)
    - 4) Contractor's name and address
    - 5) Date of submittal

b. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:

- 1) Generic name
- 2) Related specification section
- 3) Name of subcontractor
- 4) Name of manufacturer or fabricator
- 5) Name of supplier
- 6) Change Orders (numbers) that have affected value
- 7) Dollar value

a) Percentage of Contract Sum in the nearest one-hundredth percent, adjusted to total 100%

c. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Break principal subcontract amounts down into several line items.

d. Round amounts off to the nearest whole dollar; the total shall equal the Contract Sum.

e. For each part of the work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the work.

5. Margins of Cost: Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.

a. At the Contractor's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense.

6. Schedule Updating: Update and resubmit the Schedule of Values when Change Orders or Construction Change Directives result in a change in the Contract Sum.

D. Applications for Payment

1. Each Application for Payment shall be consistent with previous applications and payments as certified by the Architect and paid for by the Owner. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

2. Payment Application Times: Each progress payment date is as indicated in the Agreement. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

3. Payment Application Forms: Use Montana Form 101 as the form for Application for Payment.

4. Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Owner. Incomplete applications will be returned without action.

- a. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.
  - b. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
5. Transmittal: Submit one (1) executed copy of each Application for Payment to the Architect by means ensuring receipt within 24 hours, including waivers of lien and similar attachments, when required.
- a. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the Architect.
6. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
- a. List of subcontractors
  - b. Schedule of Values
    - 1) Contractor's Construction Schedule (preliminary if not final)
  - c. Copies of building permits
    - 1) Copies of authorizations and licenses from governing authorities for performance of the work
  - d. Certificates of insurance and insurance policies (submitted with Contract)
  - e. Performance and payment bonds (submitted with Contract if required)
7. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment; this application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the work.
8. Administrative actions and submittals that shall proceed or coincide with this application include:
- a. Occupancy permits and similar approvals
  - b. Warranties (guarantees) and maintenance agreements
  - c. Test/adjust/balance records
  - d. Maintenance instructions
  - e. Meter readings
  - f. Start-up performance reports
    - 1) Change-over information related to Owner's occupancy, use, operation and maintenance.
  - g. Final cleaning
    - 1) Application for reduction of retainage, and consent of surety

9. Final Payment Application: Administrative actions and submittals which must precede or coincide with submittal of the final Application for Payment include the following:
  - a. Completion of project closeout requirements
    - 1) Completion of items specified for completion after Substantial Completion
  - b. Assurance that unsettled claims will be settled
    - 1) Assurance that work not complete and accepted will be completed without undue delay
    - 2) Transmittal of required project construction records to Owner

END OF SECTION 01200

**SECTION 012500  
SUBSTITUTION PROCEDURES**

**PART 1 - GENERAL**

- A. Related Documents
  - 1. Drawings and general provisions of Contract, including General Conditions, Supplemental Conditions and *Instructions to Bidders*.
  
- B. Substitution Procedures
  - 1. Substitutions include changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by the Contractor.
  - 2. Substitution Requests: Submit three copies of each request on MSU Substitution Request Form 099 for each consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
    - a. Submit requests in accordance with *Instructions to Bidders*.
    - b. Identify product to be replaced and show compliance with requirements for substitutions. Include a detailed comparison of significant qualities of proposed substitution with those of the Work specified, a list of changes needed to other parts of the Work required to accommodate proposed substitution, and any proposed changes in the Contract Sum or the Contract Time should the substitution be accepted.
  
- C. Architect will review proposed substitutions and notify Contractor of their acceptance or rejection. If necessary, Architect will request additional information or documentation of evaluation.
  - 1. Architect will notify Contractor of acceptance or rejection of proposed substitution within 10 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
  
- D. Do not submit unapproved substitutions on Shop Drawings or other submittals.

**END OF SECTION 012500**

## SECTION 013000

### SUBMITTALS

#### 1.1 GENERAL

##### A. Related Documents

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

##### B. Summary

1. This Section specifies administrative and procedural requirements for submittals required for performance of the work, including:

- a. Contractor's construction schedule
- b. Submittal schedule
- c. Daily construction reports
- d. Shop Drawings
- e. Product data
- f. Samples

Note: All Submittals are to be both print and electronic.

2. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

- a. Permits
- b. Applications for Payment
- c. Performance and payment bonds
- d. Insurance certificates
- e. List of Subcontractors

3. The Schedule of Values submitted is included in Section "Applications for Payment".

4. Inspection and test reports are included in Section "Quality Requirements".

5. Unless otherwise instructed by the Owner all submittals shall be directed to Architect/Engineer Consultant of Record. The Contractor's construction schedule, submittal schedule and daily construction reports shall be directed to the Consultant's representative, the State of Montana's representative and MSU's representative. Shop drawings, product data and samples shall be directed to the Consultant's representative.

##### C. Submittal Procedures

1. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
  - a. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

- b. Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by the need to review submittals concurrently for coordination.
    - 1) The Consultant reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
  - c. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
    - 1) Allow two (2) weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Consultant will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
    - 2) If an intermediate submittal is necessary, process the same as the initial submittal.
    - 3) Allow two (2) weeks for reprocessing each submittal.
    - 4) No extension of contract time will be authorized because of failure to transmit submittals to the Consultant sufficiently in advance of the work to permit processing.
2. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
- a. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
  - b. Include the following information on the label for processing and recording action taken.
    - 1) Project name and PPA Number
    - 2) Date
    - 3) Name and address of Consultant
    - 4) Name and address of Contractor
    - 5) Name and address of Subcontractor
    - 6) Name and address of supplier
    - 7) Name of manufacturer
      - a) Number and title of appropriate Specification Section
      - b) Drawing number and detail references, as appropriate
3. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Consultant using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.
- a. On the transmittal record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include

Contractor's certification that information complies with Contract Documents requirements.

- b. Transmittal Form: Contractor's standard form.

D. Contractor's Construction Schedule

1. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart type Contractor's construction schedule. Submit both in print and electronically within thirty (30) days of the date established for "Commencement of the Work".
  - a. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the work as indicated in the "Schedule of Values".
  - b. Within each time bar indicate estimated completion percentage in 10 percent increments. As work progresses, place a contrasting mark in each bar to indicate actual completion.
  - c. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
  - d. Secure time commitments for performing critical elements of the work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the work.
  - e. Coordinate the Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other schedules.
  - f. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Consultant's procedures necessary for certification of Substantial Completion.
2. Work Stages: Indicate important stages of construction for each major portion of the Work, including testing and installation.
3. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the work. Indicate where each element in an area must be sequenced or integrated with other activities.
4. Cost Correlation: At the head of the schedule, provide a two (2) item cost correlation line, indicating "pre-calculated" and "actual" costs. On the line show dollar-volume of work performed as of the dates used for preparation of payment requests.
  - a. Refer to Section "Price and Payment Procedures" for cost reporting and payment procedures.
5. Distribution: Following response to the initial submittal, print and distribute copies to the Consultant, Owner, subcontractors, and other parties required to comply with scheduled dates. Transmit electronically and post copies in the project meeting room and temporary field office.
  - a. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have



completed their assigned portion of the work and are no longer involved in construction activities.

6. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule electronically and in print concurrently with report of each meeting.

E. Submittal Schedule

1. After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within ten (10) days of the date required for establishment of the Contractor's construction schedule.

- a. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products, as well as the Contractor's construction schedule.
- b. Prepare the schedule in chronological order; include submittals required during the first thirty (30) or sixty (60) days of construction. Provide the following information:

- 1) Scheduled date for the first submittal
- 2) Related section number
- 3) Submittal category
- 4) Name of subcontractor
- 5) Description of the part of the work covered
- 6) Scheduled date for resubmittal
  - a) Scheduled date the Consultant's final release or approval

2. Distribution: Following response to initial submittal, print and distribute copies to the Consultant, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the project meeting room and field office.

- a. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in construction activities.

3. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

F. Daily Construction Reports

1. Prepare a daily construction report, recording the following information concerning events at the site; and submit duplicate copies to the Consultant at weekly intervals:

- a. List of subcontractors at the site
- b. Approximate count of personnel at the site
- c. High and low temperatures, general weather conditions
- d. Accidents and unusual events
- e. Meetings and significant decisions

- f. Stoppages, delays, shortages, losses
  - g. Meter readings and similar recordings
  - h. Emergency procedures
  - i. Orders and requests of governing authorities
  - j. Change Orders received, implemented
  - k. Services connected, disconnected
  - l. Equipment or system tests and start-ups
  - m. Partial completions, occupancies
  - n. Substantial Completions authorized
- G. Shop Drawings
1. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the project is not considered Shop Drawings.
  2. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings. Include the following information:
    - a. Dimensions
    - b. Identification of products and materials included
    - c. Compliance with specified standards
    - d. Notation of coordination requirements
    - e. Notation of dimensions established by field measurement
    - f. Sheet Size: Except for templates, patterns and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2" x 11", but no larger than 36" x 48".
    - g. Submittal: Submit electronically and in print for the Consultant's review; Consultant's comments will be returned electronically.
      - 1) One (1) of the prints returned shall be marked-up and maintained as a "Record Document".
    - h. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
  3. Coordination drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.
    - a. Preparation of coordination drawings is specified in section "Project Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.
    - b. Submit coordination drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.
- H. Product Data
1. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's

installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings".

- a. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
  - 1) Manufacturer's printed recommendations
    - a) Compliance with recognized trade association standards
    - b) Compliance with recognized testing agency standards
  - 2) Application of testing agency labels and seals
    - a) Notation of dimensions verified by field measurement
  - 3) Notation of coordination requirements
- b. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
- c. Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.
- d. Submittals: Submit two (2) copies of each required submittal; submit four (4) copies where required for maintenance manuals. The Consultant will retain one (1), and will return the other marked with action taken and corrections or modifications required.
  - 1) Unless non-compliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
- e. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
  - 1) Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.
  - 2) Do not permit use of unmarked copies of Product Data in connection with construction.

#### I. Samples

1. Submit full-size, fully fabricated samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.
  - a. Mount, display, or package samples in the manner specified to facilitate review of qualities indicated. Prepare samples to match the Consultant's sample. Include the following:
    - 1) Generic description of the sample
    - 2) Sample source
    - 3) Product name or name of manufacturer

- 4) Compliance with recognized standards
  - 5) Availability and delivery time
2. Submit samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
    - a. Where variation in color, pattern, texture, or other characteristics are inherent in the material or product represented, submit multiple units (not less than three (3), that show approximate limits of the variations.
    - b. Refer to other specification sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.
    - c. Refer to other sections for samples to be returned to the Contractor for incorporation in the work. Such samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of sample submittals.
  3. Preliminary Submittals: Where samples are for selection of color, pattern, texture, or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.
    - a. Preliminary submittals will be reviewed and returned with the Consultant's mark indicating selection and other action.
  4. Submittals: Except for samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit three (3) sets; one (1) will be returned marked with the action taken.
    - a. Maintain sets of samples, as returned, at the project site, for quality comparisons throughout the course of construction.
      - 1) Unless non-compliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
      - 2) Sample sets may be used to obtain final acceptance of the construction associated with each set.
  5. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the work. Show distribution on transmittal forms.
    - a. Field samples specified in individual sections are special types of samples. Field samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the work will be judged.
      - 1) Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

J. Consultant's Action

1. Except for submittals for record, information, or similar purposes, where action and return is required or requested, the Consultant will review each submittal, mark to indicate action taken, and return promptly. Compliance with specified characteristics is the Contractor's responsibility.
2. Action Stamp: The Consultant will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:
  - a. Final-But-Restricted Release: When submittals are marked "Make Corrections Noted", that part of the work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
  - b. Returned for Resubmittal: When submittal is marked "Revise and Resubmit", do not proceed with that part of the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
    - 1) Do not permit submittals marked "Revise and Resubmit" to be used at the project site, or elsewhere where work is in progress.
  - c. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action not Required".

END OF SECTION 013000

**SECTION 013100  
PROJECT COORDINATION**

**1.1 GENERAL**

- A. Related Documents
  - 1. Drawings and general provisions of Contract, including General Conditions and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.
  
- B. Summary
  - 1. This section specifies administrative and supervisor requirements necessary for project coordination including, but not necessarily limited to:
    - a. Coordination
    - b. Administrative and supervisory personnel
    - c. General installation provisions
    - d. Cleaning and protection
  - 2. Field Engineering is included in Section "Field Engineering".
  - 3. Progress meetings, coordination meetings and pre-installation conferences are included in Section "Project Meetings".
  - 4. Requirements for Contractor's Construction Schedule are included in Section "Submittals".
  
- C. Coordination
  - 1. Coordination: Coordinate construction activities included under various sections of these specifications to assure efficient and orderly installation of each part of the work. Coordinate construction operations included under different sections of the specifications that are dependent upon each other for proper installation, connection, and operation.
    - a. Provide access to work at all times for inspections by Owner and authorized representatives.
    - b. Provide safe working conditions and protection of completed work.
    - c. Provide barricades and signs.
    - d. Where installation of one part of the work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
    - e. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
    - f. Make adequate provisions to accommodate items scheduled for later installation.
    - g. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
      - 1) Prepare similar memoranda for the Owner and separate Contractors where coordination of their work is required.
  - 2. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the work. Such administrative activities include, but are not limited to, the following:

- a. Notify Facilities Services or Campus Planning, Design and Construction of any expected disruptions in service or changes in construction schedule at least 72 hours (3 working days) in advance.
  - b. Preparation of schedules.
  - c. Installation and removal of temporary facilities.
  - d. Delivery and processing of submittals.
  - e. Progress meetings.
  - f. Project close-out activities.
3. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
- a. Salvage materials and equipment involved in performance of, but not actually incorporated in, the work. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.
- D. Submittals
- 1. Coordinated Drawings: Prepare and submit coordination drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.
    - a. Show the interrelationship of components shown on separate shop drawings.
    - b. Indicate required installation sequences.
    - c. Comply with requirements contained in Section "Submittals".
    - d. Section "Basic Electrical Requirements" for specific coordination drawing requirements for mechanical and electrical installations.
  - 2. Staff Names: Within 15 days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers. Post copies of the list in the project meeting room, the temporary field office, and each temporary telephone.

## 1.2 PROJECT MEETINGS

- A. Related Documents
- 1. Drawings and general provisions of the Contract, including General and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.
- B. Summary
- 1. This section specifies administrative and procedural requirements for project meetings including but not limited to:
    - a. Pre-construction conference
    - b. Pre-installment conferences
    - c. Coordination meetings
    - d. Progress meetings
- C. Pre-construction Conference
- 1. Schedule a pre-construction conference and organizational meeting.
    - a. Hold meeting at the project site or other convenient location and prior to commencement of construction activities, including the moving of

equipment on to the site. Conduct the meeting to review responsibilities and personnel assignments.

2. Attendees: The Owner, Consultant and their consultants, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the work. Both the Contractor and the Contractor's job foremen shall attend the meeting, along with all subcontractors.
3. Agenda: Discuss items of significance that could affect progress including such topics as:
  - a. Tentative construction schedule
  - b. Critical work sequencing
  - c. Designation of responsible personnel
  - d. Procedures for processing field decisions and Change Orders
  - e. Procedures for processing Applications for Payment
  - f. Distribution of Contract Documents
  - g. Submittal of Shop Drawings, Product Data and Samples
  - h. Preparation of record documents
  - i. Use of the premises
  - j. Office, work and storage areas
  - k. Equipment deliveries and priorities
  - l. Safety procedures
  - m. First aid
  - n. Security
  - o. Housekeeping
  - p. Working hours

D. Pre-Installation Conferences

1. Conduct a pre-installation conference at the site before each construction activity that requires coordination with other construction. The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Consultant of scheduled meeting dates.
2. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:
  - a. Contract Documents
  - b. Options
  - c. Related Change Orders
  - d. Purchases
  - e. Deliveries
  - f. Shop Drawings, Product Data and quality control samples
  - g. Possible conflicts
  - h. Compatibility problems
  - i. Time schedules
  - j. Weather limitations
  - k. Manufacturer's recommendations
  - l. Compatibility of materials
  - m. Acceptability of substrates
  - n. Temporary facilities
  - o. Space and access limitations
  - p. Governing regulations



- q. Safety
  - r. Inspection and testing requirements
  - s. Required performance results
  - t. Recording requirements
  - u. Protection
3. The Consultant will record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Consultant.
  4. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of work and reconvene the conference at the earliest feasible date.
- E. Coordination Meeting
1. Conduct project coordination meetings at regularly scheduled times convenient for all parties involved. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation meetings.
  2. Request representation at each meeting by every party currently involved in coordination or planning for the construction activities involved.
  3. The Consultant will record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.
- F. Progress Meetings
1. Conduct progress meetings at the project site at regularly scheduled intervals. Coordinate with the Owner and Consultant of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.
  2. Attendees: In addition to representatives of the Owner and Consultant, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the project and authorized to conclude matters relating to progress.
  3. Agenda: Visit job site to raise specific pending issues prior to meeting. Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the contract time.
    - b. Review the present and future needs of each entity present, including such items as:
      - 1) Interface requirements
      - 2) Time
      - 3) Sequences
      - 4) Deliveries
      - 5) Off-site fabrication problems
      - 6) Access
      - 7) Site utilization

- 8) Temporary facilities and services
  - 9) Hours of work
  - 10) Hazards and risks
  - 11) Housekeeping
  - 12) Quality and work standards
  - 13) Change Orders
  - 14) Documentation of information for payment requests
4. Reporting: The Consultant shall distribute printed and electronic copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
- a. Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

### 1.3 PRODUCTS (NOT APPLICABLE)

### 1.4 EXECUTION

#### A. General Installation Provisions

1. Inspection of Conditions: Require the installer of each major component to inspect both the substrate and conditions under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
2. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
3. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
4. Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for expansion and building movement.
5. Visual Effects: Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable choices to the Consultant for final decision.
6. Recheck measurements, quantities and dimensions, before starting each installation.
7. Install each component during weather conditions and project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
8. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
9. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated and in compliance with accessibility requirements. Refer questionable mounting height decisions to the Consultant for final decision.

#### B. Cleaning and Protection

1. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

2. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
3. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
  - a. Excessive static or dynamic loading
  - b. Excessive internal or external pressures
  - c. Excessively high or low temperatures
  - d. Thermal shock
  - e. Excessively high or low humidity
  - f. Air contamination or pollution
  - g. Water or ice
  - h. Solvents
  - i. Chemicals
  - j. Light
  - k. Radiation
  - l. Puncture
  - m. Abrasion
  - n. Heavy traffic
  - o. Soiling, staining and corrosion
  - p. Bacteria
  - q. Rodent and insect infestation
  - r. Combustion
  - s. Electrical current
  - t. High speed operation
  - u. Improper lubrication
  - v. Unusual wear or other misuse
  - w. Contact between incompatible materials
  - x. Destructive testing
  - y. Misalignment
  - z. Excessive weathering
    - aa. Unprotected storage
    - ab. Improper shipping or handling
    - ac. Theft
    - ad. Vandalism

**END OF SECTION 013100**

## SECTION 014000 QUALITY REQUIREMENTS

### 1.1 GENERAL

#### A. RELATED DOCUMENTS

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

#### B. SUMMARY

1. This Section specifies administrative and procedural requirements for quality control services.
2. Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by the Architect.
3. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.
4. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
  - a. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.
  - b. Inspections, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
  - c. Requirements for the Contractor to provide quality control services required by the Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

#### C. RESPONSIBILITIES

1. Contractor Responsibilities: The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity; these services include those
  - a. Services specified to be performed by an independent agency and not by the Contractor. Costs for these services shall be included in the Contract Sum.
  - b. The Contractor shall employ and pay an independent agency, to perform specified quality control services.
  - c. The Owner will engage and pay for the services of an independent agency

- to perform inspections and tests specified as the Owner's responsibility. Payment for these services will be made by the Owner.
- d. Where the Owner has engaged a testing agency or other entity for testing and inspection of a part of the Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless otherwise agreed in writing with the Owner.
2. Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services provide unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.
    - a. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.
  3. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Associated services required include but are not limited to:
    - a. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
    - b. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
    - c. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
    - d. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
    - e. Security and protection of samples and test equipment at the Project site.
  4. Owner Responsibilities: The Owner will provide inspections, tests and similar quality control services specified to be performed by independent agencies and not by the Contractor, except where they are specifically indicated as the Contractor's responsibility or are provided by another identified entity. Costs for these services are not included in the Contract Sum.
    - a. The Owner will employ and pay for the services of an independent agency, testing laboratory or other qualified firm to perform services which are the Owner's responsibility.
  5. Duties of the Testing Agency: The independent testing agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Architect and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.
    - a. The agency shall notify the Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

- b. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
  - c. The agency shall not perform any duties of the Contractor.
6. Coordination: The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

#### D. SUBMITTALS

- 1. The independent testing agency shall submit a certified written report and electronic copy of each inspection, test or similar service, to the Architect, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible for the service, submit a certified written report of each inspection, test or similar service through the Contractor, in duplicate.
  - a. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
  - b. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:
    - 1) Date of issue
    - 2) Project title and number
    - 3) Name, address and telephone number of testing agency
    - 4) Dates and locations of samples and tests or inspections
    - 5) Names of individuals making the inspection or test
    - 6) Designation of the Work and test method
    - 7) Identification of product and Specification Section
    - 8) Complete inspection or test data
    - 9) Test results and in interpretations of test results
    - 10) Ambient conditions at the time of sample-taking and testing
    - 11) Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements
    - 12) Name and signature of laboratory inspector
    - 13) Recommendations on retesting

#### DI. QUALITY ASSURANCE

- 1. Qualification for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.
- 2. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State of Montana.

1.2 PRODUCTS (NOT APPLICABLE)

1.3 EXECUTION

A. GENERAL

1. Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes.
2. Protect construction exposed by or for quality control service activities, and protect repaired construction.
3. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

**END OF SECTION 014000**

**SECTION 015000  
TEMPORARY FACILITIES AND UTILITIES**

1.1 GENERAL

A. RELATED DOCUMENTS

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

B. SUMMARY

1. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.
2. Temporary utilities required may include but are not limited to:
  - a. Telephone service
  - b. Electric Service
  - c. Water
  - d. Natural gas
  - e. Sewer
3. Temporary construction and support facilities required may include but are not limited to:
  - a. Field offices and storage sheds.
  - b. Sanitary facilities, including drinking water
  - c. Temporary Project identification signs and bulletin boards
  - d. Waste Disposal services
  - e. Construction aids and miscellaneous services and facilities
4. Security and protection facilities required include but are not limited to:
  - a. Temporary Security Fencing
  - b. Temporary fire protection
  - b. Barricades, warning signs, lights
  - c. Environmental protection

C. QUALITY ASSURANCE

1. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
  - a. Building Code requirements
  - b. Health and safety regulations
  - c. Utility company regulations
  - d. Police, Fire Department and Rescue Squad rules
  - e. Environmental protection regulations
2. Standards: Comply with NFPA Code 241, "Building Construction and



Demolition Operations" and ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition".

D. PROJECT CONDITIONS

1. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

1.2 PRODUCTS

A. MATERIALS

1. General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.
2. Water: Provide potable water approved by local health authorities.
3. Open-Mesh Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized barbed wire top strand and galvanized steel pipe posts, 1 1/2" I.D. for line posts and 2-1/2" I.D. for corner posts.

B. EQUIPMENT

1. General: Provide new equipment; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.
2. Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.
3. Electrical Outlets: Provide properly configured NEA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.
4. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.
5. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.
6. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.
7. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material.

9. First Aid Supplies: Comply with governing regulations.
10. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
  - a. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

### 1.3 EXECUTION

#### A. INSTALLATION

1. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work and Owner's operations. Relocate and modify facilities as required.
2. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

#### B. TEMPORARY UTILITIES

1. Temporary Telephones: Provide temporary telephone service for all personnel engaged in construction activities, throughout the construction period. Provide cellular telephone, operational and on site at all times.

#### C. TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

1. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access and minimal interruption to Owner's operations.
  - a. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
2. Field Offices: The Contractor, at his option, shall provide insulated, weather tight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip offices as follows:
  - a. Furnish with a desk and chairs, a 4-drawer file cabinet, plan table and plan rack and a 6-shelf bookcase.
  - b. Equip with a water cooler and private toilet complete with water closet, lavatory and mirror-medicine cabinet unit.
3. Storage and Fabrication Sheds: Install storage and fabrication sheds, sized, furnished and equipped to accommodate materials and equipment involved,

including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on the site.

4. Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
  - a. Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used material.
5. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.
6. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
  - a. Provide safety showers, eye-wash fountains and similar facilities for convenience, safety and sanitation of personnel.
7. Drinking Water Facilities: Provide containerized tap-dispenser bottled-water type drinking water units, including paper supply.
  - a. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F (7 to 13 deg C).
8. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg. F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner. Do not use University trash containers for any reason.

#### D. SECURITY AND PROTECTION FACILITIES INSTALLATION

1. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
  - (a) Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
2. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
3. Open-Mesh Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized barbed wire top strand and galvanized steel

pipe posts, 1 1/2" I.D. for line posts and 2-1/2" I.D. for corner posts.

4. Barricades, Warning Signs and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
5. Do not remove temporary security and protection facilities until Substantial Completion, or longer as requested by the Architect.
6. Temporary Fire Protection: Install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations."
  - a. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
  - b. Store combustible materials in containers in fire-safe locations.
  - c. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
  - d. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.
7. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

#### E. OPERATION, TERMINATION AND REMOVAL

1. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
2. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
3. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
  - a. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.

END OF SECTION 015000

## SECTION 016000 - PRODUCT REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including General and Supplemental Conditions and Division 1 Specification Sections, apply to this section.

#### 1.2 SECTION REQUIREMENTS

- A. Provide products of same kind from a single source. The term "product" includes the terms "material," "equipment," "system," and similar terms.
- B. Deliver, store, and handle products according to manufacturer's written instructions, using means and methods that will prevent damage, deterioration, and loss, including theft.
  - 1. Inspect products at time of delivery for compliance with the Contract Documents and to ensure items are undamaged and properly protected.
- C. Product Substitutions: Reasonable and timely requests for substitutions will be considered. Substitutions include products and methods of construction differing from that required by the Contract Documents and proposed by Contractor after award of Contract. Substitutions only allowed for products when more than one manufacturer is indicated.
  - 1. Submit two (2) copies of each request for product substitution. Identify product to be replaced and provide complete documentation showing compliance of proposed substitution with applicable requirements. Include a full comparison with the specified product, a list of changes to other Work required to accommodate the substitution, and any proposed changes in Contract Sum or Contract Time should the substitution be accepted.
  - 2. Submit requests for product substitution in time to permit processing of request and subsequent Submittals, if any, sufficiently in advance of when materials are required in the Work. Do not submit unapproved substitutions on Shop Drawings or other submittals.
  - 3. Owner will review the proposed substitution and notify Contractor of its acceptance or rejection.

### PART 2 - PRODUCTS

#### 2.1 PRODUCT OPTIONS

- A. Provide products that comply with the Contract Documents, are undamaged, and are new at the time of installation.
  - 1. Provide products complete with accessories, trim, finish, and other devices and components needed for a complete installation and the intended use and effect.

B. Select products as follows:

1. Where only a single product or manufacturer is named, provide the item indicated. No substitutions will be permitted.
2. Where two or more products or manufacturers are named, provide one of the items indicated. No substitutions will be permitted.
3. Where products or manufacturers are specified by name, accompanied by the term "or equal," provide the named item or comply with provisions concerning "product substitutions" to obtain approval for use of an unnamed product or manufacturer.
4. Where a product is described with required characteristics, with or without naming a brand or trademark, provide a product that complies with those characteristics and other Contract requirements.
5. Where compliance with performance requirements is specified, provide products that comply and are recommended in writing by the manufacturer for the application.
6. Where compliance with codes, regulations, or standards, is specified, select a product that complies with the codes, regulations, or standards referenced.

C. Unless otherwise indicated, Owner will select color, pattern, and texture of each product from manufacturer's full range of options.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 016000

**SECTION  
173000  
EXECUTION**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Installation of the Work.
3. Cutting and patching.
4. Coordination of Owner-installed products.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

- B. Related Requirements:

1. Section 011000 "Summary" for limits on use of Project site.

1.3 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Consultant of locations and details of cutting and await directions from Consultant before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or those results in increased maintenance or decreased operational life or safety.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Consultant's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
  - 1. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Consultant for the visual and functional performance of in-place materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a written and email request for information to Consultant.



### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings. If discrepancies are discovered, promptly notify Consultant by email and in writing.
  - 1. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  - 2. Inform installers of lines and levels to which they must comply.
  - 3. Check the location, level and plumb, of every major element as the Work progresses.
  - 4. Notify Consultant when deviations from required lines and levels exceed allowable tolerances.
- B. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Consultant.

### 3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Consultant, and in compliance with accessibility requirements.
  2. Allow for building movement, including thermal expansion and contraction.
  3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
  - J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.
- 3.5 CUTTING AND PATCHING
- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
    1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
  - B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
  - C. Temporary Support: Provide temporary support of work to be cut.
  - D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
  - E. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
    1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
    2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
    3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond- core drill.
    4. Proceed with patching after construction operations requiring cutting are complete.
  - F. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
    1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  4. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- G. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### 3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
  3. Containerize hazardous and unsanitary waste materials separately from other waste.
  4. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
  2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
1. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- H. Clean and provide maintenance on completed construction as frequently as necessary through

the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

- I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.7 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

### 3.8 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

**END OF SECTION 017300**

**SECTION 017400  
WARRANTIES AND  
BONDS**

1.1 GENERAL

A. RELATED DOCUMENTS

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

B. SUMMARY

1. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers standard warranties on products and special warranties.
  - a. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.
  - b. General closeout requirements are included in Section "Project Closeout."
  - c. Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual Sections of Divisions-2 through -16.
  - d. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
2. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

C. DEFINITIONS

1. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
2. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

D. WARRANTY REQUIREMENTS

1. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
2. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
3. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with

requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefitted from use of the Work through a portion of its anticipated useful service life.

4. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
  - a. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
5. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

#### E. SUBMITTALS

1. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.
  - a. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within fifteen days of completion of that designated portion of the Work.
2. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate items and identification, ready for execution by the required parties. Submit a draft to the Owner through the Architect for approval prior to final execution.
  - a. Refer to individual Sections of Divisions-2 through -16 for specific content requirements, and particular requirements for submittal of special warranties.
3. Forms of Submittal: At Final Completion compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
1. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.
  - a. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a

typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.

b. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS, the Project title or name, and the name of the Contractor.

2. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.2 PRODUCTS (NOT APPLICABLE)

1.3 EXECUTION

A. SCHEDULE OF WARRANTIES

1. Schedule: Provide warranties and bonds on products and installations as specified in the appropriate Sections.

**END OF SECTION 017400**

## SECTION 017419 WASTE MANAGEMENT

### PART 1 - GENERAL

#### 1.1 WASTE MANAGEMENT REQUIREMENTS

Owner requires that this project generate the least amount of trash and waste possible. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration and shall be recycled:

- Aluminum and plastic beverage containers.
- Corrugated cardboard.
- Wood pallets.
- Clean dimensional wood: May be used as blocking or furring.
- Land clearing debris, including brush, branches, logs, and stumps.
- Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.

Methods of trash/waste disposal that are **not** acceptable are:

- Burning on the project site.
- Burying on the project site.
- Dumping or burying on other property, public or private. Other illegal dumping or burying.

Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, State and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

#### 1.2 DEFINITIONS

Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

Non-hazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

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

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 by others.

Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

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.

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



**SECTION 017320  
WASTE MANAGEMENT**

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

Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

Toxic: Poisonous to humans either immediately or after a long period of exposure.

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

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.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

1.3 WASTE MANAGEMENT PLAN IMPLEMENTATION

Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and the Architect.

Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

Meetings: Discuss trash/waste management goals and issues at project meetings, including the Pre-bid meeting, Pre-construction meeting and regular job-site meetings.

Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.

As a minimum, provide:

Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.

Separate dumpsters for each category of recyclable.

Recycling bins at worker lunch area.

Provide containers as required.

Provide adequate space for pick-up and delivery and convenience to subcontractors. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION 017419

**SECTION 017700  
PROJECT  
CLOSEOUT**

**1.1 GENERAL**

**A. RELATED DOCUMENTS**

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

**B. SUMMARY**

1. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
  - a. Inspection procedures
  - b. Project record document submittal
  - c. Operating and maintenance manual submittal
  - d. Submittal of warranties
  - e. Final cleaning
  - f. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions - 2 through - 33.

**C. SUBSTANTIAL COMPLETION**

1. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
  - a. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
    - 1) If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
  - b. Advise Owner of pending insurance change-over requirements.
  - c. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
  - d. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
  - e. See the *Supplemental Conditions of the Contract for Construction* 3.11 for Documentation and As-Built Conditions, and the *Project Closeout Checklist: Contractor Requirements*. Submit maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar final record information.
  - f. Deliver tools, spare parts, extra stock, and similar items.
  - h. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
  - i. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

2. Inspection Procedures: On receipt of a request for inspection, the Consultant will either proceed with inspection or advise the Contractor of unfilled requirements. The Consultant will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
    - a. The Consultant will repeat inspection when requested and assured that the Work has been substantially completed.
    - b. Results of the completed inspection will form the basis of requirements for final inspection.
- D. FINAL ACCEPTANCE
1. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
    - a. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
    - b. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
    - c. Submit a certified copy of the Consultant's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Consultant.
    - e. Submit consent of surety to final payment.
    - f. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  2. Re-inspection Procedure: The Consultant will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Consultant.
    - a. Upon completion of re-inspection, the Consultant will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
    - b. If necessary, re-inspection will be repeated.
- E. RECORD DOCUMENT SUBMITTALS
1. **See also the *Supplemental Conditions of the Contract for Construction 3.11 for Documentation and As-Built Conditions, and the Project Closeout Checklist: Contractor Requirements.***
  2. General: Do not use record documents (red-line markups) for construction purposes; protect from deterioration and loss in a secure, fire-resistant location; provide access to record documents for the Consultant's reference during normal working hours.
  3. Record Drawings (Red-lined): Maintain two clean, undamaged sets of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the sets to show the red-line changes during the course of construction with actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the

corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

- a. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
  - b. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
  - c. Note related Change Order numbers where applicable.
  - d. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
4. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.
- a. Upon completion of the Work, submit record Specifications to the Consultant for the Owner's records.
5. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark up of record drawings and Specifications.
- a. Upon completion of mark-up, submit (3) complete sets of record Product Data to the Consultant for the Owner's records.
6. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Consultant and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area
7. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Consultant for the Owner's records.
8. Maintenance Manuals: Provide one (1) draft copy for review. Provide **one (1)** final paper copy and one electronic pdf file prior to final completion. Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 3-inch, 3 ring vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include the following types of information; and others as specified in other Divisions:
- a. Emergency instructions
  - b. Spare parts list
  - c. Copies of warranties
  - d. Wiring diagrams

- e. Recommended "turn around" cycles
- f. Inspection procedures
- g. Shop Drawings and Product Data
- h. Fixture lamping schedule
- i. List of final color and material selections

## F. WARRANTIES AND BONDS

### 1. SUMMARY

- a. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.
  - 1) Refer to the General Conditions and Supplemental Conditions for terms of the Contractor's special warranty of workmanship and materials.
  - 2) General closeout requirements are included in Section "Project Closeout."
  - 3) Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual Sections of Divisions-2 through -16.
  - 4) Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- b. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
- c. Separate Prime Contracts: Each prime Contractor is responsible for warranties related to its own Contract.

### 2. DEFINITIONS

- a. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- b. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

## G. WARRANTY REQUIREMENTS

- a. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- b. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- c. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is

responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefitted from use of the Work through a portion of its anticipated useful service life.

- d. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
  - 1) Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- di. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

#### 4. SUBMITTALS

- a. Submit written warranties to the Consultant prior to the date certified for Substantial Completion. If the Consultant's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Consultant.
  - 1) When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Consultant within fifteen days of completion of that designated portion of the Work.
- b. Forms of Submittal: At Final Completion compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- c. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.
  - 1) Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name or the product, and the name, address and telephone number of the installer.
  - 2) Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS, the Project title or name, and the name of the Contractor.
- d. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

## 1.2 EXECUTION

### A. CLOSEOUT PROCEDURES

1. Functional Demonstration: Demonstrate proper operation of all systems to Consultants and Owners representative prior to request for substantial completion. Coordinate schedule with Consultant.
2. Operating and Maintenance Instructions: Provide two (2) duplicate training sessions for each MSU trade group responsible for systems installed under this project. Coordinate schedule with Owner. Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:
  - a. Maintenance manuals
  - b. Record documents
  - c. Spare parts and materials
  - d. Tools
  - e. Lubricants
  - f. Fuels
  - g. Identification systems
  - h. Control sequences
  - i. Hazards
  - j. Cleaning
  - k. Warranties and bonds
    - 1) Maintenance agreements and similar continuing commitments

**END OF SECTION 017700**

**SECTION 017823  
OPERATION AND MAINTENANCE DATA**

PART 1 - GENERAL

1.1 A.RELATED DOCUMENTS

- A. General provisions of Contract, including General and Supplemental Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory.
  - 2. Operation manuals for systems, subsystems, and equipment.
  - 3. Product maintenance manuals.
  - 4. Systems and equipment maintenance manuals.

1.3 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
  - 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
  - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
  - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
    - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
    - b. Enable inserted reviewer comments on draft submittals.
  - 2. One paper copy and one electronic pdf. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will deliver copies to the Owner.
- C. Manual Submittal: Submit each manual in DRAFT in PDF format form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments. PROVIDE PAPER AND PDF OF FINAL APPROVED MANUALS



1. Correct or revise each manual to comply with Architect's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Authority's comments and prior to commencing demonstration and training.

## PART 2 - PRODUCTS

### 2.1 REQUIREMENTS FOR OPERATION, AND MAINTENANCE MANUALS

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.
- B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
  1. Title page.
  2. Table of contents.
  3. Manual contents.
- C. Title Page: Include the following information:
  1. Subject matter included in manual.
  2. Name and address of Project.
  3. Name and address of Owner.
  4. Date of submittal.
  5. Name and contact information for Contractor.
  6. Name and contact information for Construction Manager.
  7. Name and contact information for Architect.
  8. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
  9. Cross-reference to related systems in other operation and maintenance manuals.
- D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- F. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
  1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
  2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily

navigated file tree. Configure electronic manual to display bookmark panel on opening file.

- G. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: These binders are sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and oversize sheets will need to be folded to 8x11.5.
    - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
  2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
  3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
  4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
    - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

## 2.2 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
  2. Performance and design criteria if Contractor is delegated design responsibility.
  3. Operating standards.
  4. Operating procedures.
  5. Operating logs.
  6. Wiring diagrams.
  7. Control diagrams.
  8. Precautions against improper use.
  9. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
  2. Manufacturer's name.
  3. Equipment identification with serial number of each component.
  4. Equipment function.
  5. Operating characteristics.
  6. Limiting conditions.

7. Performance curves.
  8. Engineering data and tests.
  9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
  2. Equipment or system break-in procedures.
  3. Routine and normal operating instructions.
  4. Regulation and control procedures.
  5. Instructions on stopping.
  6. Normal shutdown instructions.
  7. Seasonal and weekend operating instructions.
  8. Required sequences for electric or electronic systems.
  9. Special operating instructions and procedures.
- CI. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- CII. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

## 2.3 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
  2. Manufacturer's name.
  3. Color, pattern, and texture.
  4. Material and chemical composition.
  5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
  2. Types of cleaning agents to be used and methods of cleaning.
  3. List of cleaning agents and methods of cleaning detrimental to product.
  4. Schedule for routine cleaning and maintenance.
  5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

## 2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
  - 1. Standard maintenance instructions and bulletins.
  - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
  - 3. Identification and nomenclature of parts and components.
  - 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
  - 1. Test and inspection instructions.
  - 2. Troubleshooting guide.
  - 3. Precautions against improper maintenance.
  - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - 5. Aligning, adjusting, and checking instructions.
  - 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

## PART 3 - EXECUTION

### 3.1 MANUAL PREPARATION

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

- B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
- D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original project record documents as part of operation and maintenance manuals.
- E. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

#### PART 4 - MATERIAL AND FINISHES MAINTENANCE MANUAL

- A. General: Incorporate as part of the O& M Manuals. Material and finishes to the Architect/Engineer for approval and distribution. Provide one section for architectural products, including applied materials and finishes, and a second section for products designed for moisture protection and products exposed to the water.
  - 1. Refer to individual specification sections for additional requirements on the care and maintenance of materials and finishes
- B. Architectural Products, Applied Materials and Finishes: Provide complete manufacturers data and instructions on the care and maintenance of architectural products, including applied materials and finishes.
- C. Manufacturers Data: Provide complete information on architectural products, including but not limited to the following items, as applicable:
  - 1. Manufacturer's catalog number
  - 2. Size
  - 3. Material composition
  - 4. Color texture reordering information for specially manufactured products
  - 5. Manufacturer and supplier/installers contact information
  - 6. Warranty terms
- D. Care and Maintenance Instruction: Provide complete information on the care and maintenance of architectural products, including the manufacturer's recommendations for the types of cleaning agents to be used and the methods of cleaning. In addition, provide information regarding cleaning agents and methods which could prove detrimental to the product. Include the manufacturer's recommended schedule for cleaning and maintenance.

- E. Manufacturer's Data: Provide complete manufacturer's data giving detailed information including, but not limited to the following, as applicable:
  - 1. Applicable standards
  - 2. Chemical composition
  - 3. Installation details
  - 4. Inspection procedures
  - 5. Maintenance information
  - 6. Repair procedures
  
- F. Schedule: Provide complete information in the materials and finishes manual on products specified in the following sections: (To be determined with Owner)
  
- G. Color Schedule: Provide complete information on MSU CPDC provided electronic spreadsheet form, to include manufacturer's name and number, location, item and surface of all painted, stained or treated material, surface or piece of equipment.

**END OF SECTION 017823**

**SECTION 017839  
PROJECT RECORD DOCUMENTS**

PART 1 - GENERAL

1.1 SUMMARY

- A. See also General Conditions and Supplemental Conditions of the Contract for Construction.
- B. **See the *Supplemental Conditions of the Contract for Construction 3.11 for Documentation and As-Built Conditions, and the Project Closeout Checklist: Contractor Requirements***
- C. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- D. Related Requirements:
  - 1. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 2. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings (Redline Markups): Comply with the following:
  - 1. Number of Copies: Submit copies of record Drawings as follows:
    - a. Draft Submittal:
      - 1) Submit PDF electronic files of scanned record prints.
      - 2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
    - b. Final Submittal:
      - 1) Submit one paper-copy set(s) of marked-up record prints.
      - 2) Submit PDF electronic files of scanned record prints and one set(s) of prints.
      - 3) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one annotated PDF electronic files and directories of each submittal.

## PART 2 - PRODUCTS

### 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Record data as soon as possible after obtaining it.
    - c. Record and check the markup before enclosing concealed installations.
  2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  2. Format: Annotated PDF electronic file with comment function enabled.
  3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
  4. Identification: As follows:
    - a. Project name and PPA Number.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

### 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.



4. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file

### 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file.

### 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.

## PART 3 - EXECUTION

### 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

**END OF SECTION 017839**

**SECTION 017900  
DEMONSTRATION AND TRAINING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

**1. System Demonstration:**

- a. **General:**
  - i. The system demonstration is a functional test of systems to determine whether they are substantially complete and operating as specified. Systems are to be tested and confirmed to be operating properly by the contractor prior to the Demonstration.
  - ii. Where initial Demonstration Session uncovers substantial deficiencies that require more than one Demonstration Session, Contractor shall reimburse Owner for personnel costs associated with performing subsequent Sessions.
- b. **Systems to be Tested:**
  - i. All systems installed and/or provided under the project to have functional testing.
- c. **Attendance:**
  - i. The system demonstration is to be provided by trained representatives that are familiar with the systems, and can operate systems as required to test and verify proper function. The Engineer and Owner's representatives will be present to document performance and/or deficiencies. The General Contractor or others may attend if desired.
  - ii. Individual testing sessions (modules) shall be provided for each type or group of systems, separated roughly by trade group that will be performing maintenance on the system. MSU trades groups and systems typically involved in testing are:
    - (1) Electricians
    - (2) Heating Plant (Hydronic and steam heating systems, controls)
    - (3) Plumbers (Plumbing, gas-fired heating, process piping systems)
    - (4) Refrigeration (Refrigeration, chilled water, packaged cooling systems)
- d. **Schedule:**
  - i. Contractor to coordinate time requirements and dates with Owner and Engineer. Begin scheduling with sufficient time prior to desired Substantial Completion date to allow all parties to work into schedule, and for deficiencies to be completed prior to desired Substantial Completion date. Demonstration is to be provided prior to, and separate from, training.

**2. Training:**

- a. **General:**
  - i. The system training is intended to familiarize the Owner's operating and maintenance staff with all systems requiring maintenance. Training is to be provided after the systems are in place and operational, after issues noted during the Demonstration have been resolved, and before final acceptance.
- b. **Systems Requiring Training:**
  - i. All systems installed and/or provided under the project are to have training.
- c. **Attendance:**
  - i. Training is to be provided by trained representatives that are familiar with the system's operation and maintenance requirements. Individual training sessions (modules) shall be provided for each type or group of systems, separated roughly by trade group that will be performing maintenance on the system. MSU trades groups and systems typically requiring training are:
    - (1) Electricians

- (2) Heating Plant (Hydronic and steam heating systems, controls)
- (3) Plumbers (Plumbing, gas-fired heating, process piping systems)
- (4) Refrigeration (Refrigeration, chilled water, packaged cooling systems)
- d. Schedule:
  - i. Duplicate training sessions are to be provided for each training module, so that Owner's operating personnel can be split into two groups during training. Duplicate training sessions to be scheduled during different weeks. Length of training sessions will be determined by scope of training, and as coordinated with Owner after draft copy of training documents have been reviewed.

## 2.1 PRODUCTS

- 1. Not applicable

## 3.1 EXECUTION

- 1. Demonstration:

- a. Demonstration Program:

- i. Engineer to develop a demonstration program to verify the proper operation of all required systems. Submit program to Owner and Contractor at least two weeks prior to Demonstration.
- ii. Engineer to work with Contractor to generate methods to be used to verify sequences and modes of operation that cannot be verified directly.
- iii. Engineer to provide at least one copy of all submittals, contract drawings, specifications, and changes related to systems to be demonstrated. Documents to be made available during Demonstration.
- iv. Contractor to provide at least one copy of Operating and Maintenance Manuals to be used during demonstration, including specified sequences of operation for field-constructed systems, and operating sequences for all manufactured equipment.

- b. Demonstration Session:

- i. Verify that all systems are functional and ready to operate in all modes prior to demonstration.
- ii. Assemble all program materials required for demonstration.
- iii. Contractor to provide all equipment necessary for access to, and operation of, systems including tools, ladder, lighting, and diagnostic equipment.
- iv. Verify operation of individual components within systems.
- v. Verify controls of related components are coordinated.
- vi. Verify all operating sequences, operating modes, and safety controls.
- vii. Record all pressures, temperatures, and other relevant data available from installed devices.
- viii. Where digital control systems are available, set-up trend reports of relevant parameters which will confirm proper operation of systems installed, modified, or affected by changes made during this project. Provide copies of reports to Engineer and Owner for review. Review, analyze, and discuss results, and provide follow-up reports as required to confirm proper operation.

- 2. Training:

- a. Training Documentation:

- i. Contractor to submit draft copy of agenda and training documents to Owner for review at least two weeks prior to training date.
- ii. Provide a copy of the following items for each person that will be attending the

training sessions. Coordinate required number with the Owner.

- (1) Training agenda.
- (2) Summary of new systems and existing systems affected by this project.
- (3) Summary of work performed under this project.
- (4) Control system drawings and sequences of operation.
- (5) List of important maintenance and trouble-shooting operations for all systems.

iii. Provide minimum of 2 copies of following items:

- (1) Contract documents including all drawings, specifications, addendums, and change orders.

b. Training Sessions:

- i. Assemble at location to be determined by the Owner.
- ii. Distribute training documentation as indicated above.
- iii. Provide classroom style training if required for orientation, discussion of new systems and existing systems affected by this project, and other issues appropriate for a classroom format.
- iv. Visit site and review locations, and perform detailed review of operation and maintenance requirements for current systems.

**END OF SECTION 179000**

**SECTION 024119  
SELECTIVE DEMOLITION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Demolition and removal of selected portions of building or structure.
  - 2. Salvage of existing items to be reused or recycled.

**1.3 DEFINITIONS**

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

**1.4 QUALITY ASSURANCE**

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI A10.6 and NFPA 241.

**1.5 PRE-INSTALLATION MEETINGS**

- A. Pre-demolition Conference: Conduct conference at Project site.

**1.6 CLOSEOUT SUBMITTALS**

- A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

**1.7 FIELD CONDITIONS**

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
  - 1. Before selective demolition, Owner will remove the following items:
    - a. Text books and other loose classroom resources.
    - b. Loose shelving units and storage cabinets.
    - c. Loose furniture (tables and chairs).
    - d. Loose equipment.

- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is included in the Contract Documents. Examine report to become aware of locations where hazardous materials are present. Do not proceed with selective demolition until all hazardous materials have been removed. Do not proceed with selective demo until all hazardous materials have been removed.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.
2. Do not disturb hazardous materials or items suspected of containing hazardous materials
  - i. except under procedures specified elsewhere in the Contract Documents.

DI. Storage or sale of removed items or materials on-site is not permitted.

DII. Utility Service: Maintain existing utilities and the protection facilities indicated to remain in and protect them against damage during selective demolition operations.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ ASSE A10.6 and NFPA 241.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit and email a written report to Architect and MSU Project Manager.

### 3.2

#### UTILITY SERVICES AND MECHANICAL/ ELECTRICAL SYSTEMS

A. Existing Services/ Systems to Remain: Maintain services/ systems indicated to remain and protect them against damage.

B. Comply with requirements for existing services/ systems interruptions specified in Section 011000 "Summary."

C. Existing Services/ Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/ electrical systems serving areas to be selectively demolished.

1. If services/ systems are required to be removed, relocated, or abandoned, provide temporary

services/ systems that bypass area of selective demolition and that maintain continuity of services/ systems to other parts of building.

2. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
3. Piping to be removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
4. Piping to be abandoned in place: Drain piping and cap or plug piping with same or compatible piping material.
5. Equipment to be removed: Disconnect and cap services and remove equipment.
6. Equipment to be removed and reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
7. Equipment to be removed and salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
8. Ducts to be removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
9. Ducts to be abandoned in place: Cap or plug ducts with same or compatible ductwork material.

### 3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls".

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

### 3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

B. . Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

C. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

D. Do not use cutting torches for selective demolition operations.

E. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

F. Dispose of demolished items and materials promptly.

G. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area on campus as directed by Owner.
5. Protect items from damage during transport and storage.

H. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
  2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  3. Protect items from damage during transport and storage.
  4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- I. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### 3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 017419 Waste "Construction Management and Disposal".

B. Burning: Do not burn demolished materials.

### 3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

**END OF SECTION 024119**



SECTION 23 00 00

BASIC MATERIALS AND METHODS FOR HVAC

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Work of this Section includes motors, anchor bolts, support channels, grating, protective coatings, electric heat tracing, temperature maintenance tape, de-icing system, mechanical identification, access doors, sleeves, cored openings, prepared openings, seals, prefabricated penetration flashing units, sealing of mechanical penetrations through walls, and partitions, seismic restraints, wind restraints, and miscellaneous other basic materials.

1.02 SUBMITTALS

- A. Product Data:
  - 1. Anchor bolts.
  - 2. Support channels.
  - 3. Electric heat tracing.
  - 4. Equipment, piping, and valve identification.
  - 5. Pipe seals.
  - 6. Grout.
- B. VOC Submittal: Submit a VOC Submittal Form for each adhesive, coating, and sealant used in Division 23. Submittal Form shall show that adhesives, coatings, and sealants are in compliance with VOC limit requirements.

PART 2 - PRODUCTS

2.01 MISCELLANEOUS MATERIALS

- A. Pipe Sleeves: Schedule 40 galvanized steel pipe with unthreaded ends.
- B. Inserts: Steel or malleable concrete insert, Anvil International Figure 282, 285, or equivalent.
- C. Anchor Bolts:
  - 1. Anchor Bolts (Cast-In-Place): Galvanized steel bolts conforming to requirements of ASTM A307 and galvanized steel nuts conforming to requirements of ASTM A194. Number and size per manufacturer's recommendations or as shown. In concrete construction, provide bolts set in formwork before pouring concrete. In building floors where equipment bases are cast iron over 18 inches maximum dimension, provide a pipe sleeve around each bolt to allow for positioning.
  - 2. Anchor Bolts (Expansion Type): Molly "Parabolt" or Hilti "Kwik-Bolt III"; Type 304 stainless steel construction; with impact section on end of bolt.
  - 3. Anchor Bolts (Epoxy Type): Hilti "Type HIT-RE-500-SD Epoxy Adhesive" or equivalent; two part anchoring epoxy conforming to requirements of ASTM C881 Type IV; Grades 2 and 3; Classes A, B, and C except for gel time. Galvanized steel bolts conforming to requirements ASTM A307 and galvanized steel nuts conforming to requirements of ASTM A194; IBC compliant.

- D. Support Channels: Unistrut, Cooper B-Line, or Powerstrut; manufacturers shall be members of MFMA; steel support channels shall conform to MFMA "Metal Framing Standards Publication"; non-perforated channels, 12 gage (0.105 inch) minimum, 1-5/8 inch by 1-5/8 inch minimum cross-section size; with hex-head bolt, nut, and spring; hot dip galvanized finish unless indicated otherwise.
- E. Expanded Metal: Ryex "Standard" expanded metal Style Designation 3/4 No. 16; with first number representing width to short way of diamond measuring from center to center of bonds and second number representing approximate gage of sheet.
- F. Guy Wires, Fittings, and Hardware: Following accessories shall be furnished as needed to support and maintain alignment. Materials shall have a hot-dip galvanized finish.
  - 1. Guy Wires: ASTM A475, extra high strength grade, extra galvanized, stranded with 7 or 19 wires in each strand. Thimbles shall be provided at each end of guy wires.
  - 2. Clamps: Hot-dip galvanized forged high carbon steel clamps capable of developing full strength of guy wire, and fitted with galvanized heat-treated bolts. Provide two clamps at each connection of guy wire.
  - 3. Turnbuckles: Open type, forged steel body, with jaw and jaw end pulls, hot-dip galvanized.
  - 4. Anchor Rods and Anchors: Thimble-eye, steel rod with screw anchor, hot-dip galvanized.

## 2.02 ADHESIVES, COATINGS, AND SEALANTS

- A. Adhesives, coatings, and sealants shall be in compliance with VOC limit requirements. Refer to individual Sections in Division 23 for specifications on adhesives, coatings, and sealants.

## 2.03 ELECTRIC HEAT TRACING

- A. Manufacturer: Thermon or equivalent of Raychem.
- B. Provide self-regulating heaters (Thermon FLX) with two 16 gage nickel plated copper bus wires imbedded in a self-regulating polymer core that varies its power output to respond to temperature along its length, allowing heater to be crossed over itself without overheating. Heaters shall be UL listed and shall have a minimum self-regulation factor of 90 percent. Furnish with connection kit as required.
- C. For freeze protection provide length of element per foot of pipe and valves in accordance with manufacturer's recommendation based on thickness of insulation specified in Section 20 07 19, 40 degrees F temperature difference, and 40 degrees F pipe maintenance temperature. Provide an ambient sensing thermostat, Thermon model B4X-15140 set at 40 degrees F to directly control heat tracing system.

## 2.04 EQUIPMENT, PIPING, AND VALVE IDENTIFICATION

- A. Valve Tags: Valve tags shall be of 19 gage brass with stamped, black-enamel-filled characters. Provide with brass chain and brass S-hook. At Contractor's option, valve tags may be black and white laminated plastic with lettering engraved through black cover to white backing.
- B. Nameplates: Laminated black and white plastic with lettering cut through to white background.

- C. Pipe Markers and Directional Flow Arrows: Semi-rigid plastic or adhesive identification markers and directional flow arrows. Markers shall conform to requirements of ASME A13.1, unless specified otherwise.

#### 2.05 GROUT

- A. Hydraulic cement-based metallic-aggregate non-shrink grout conforming to requirements of CRD-C-621 Grades B and C and ASTM C1107.

#### 2.06 SPECIAL MAINTENANCE MATERIALS

- A. Provide for equipment requiring frequent replacement of maintenance materials, such as filters, lubricants, etc.; provide a 3 month supply to Owner, together with grease guns or other application devices and instructions.

### PART 3 - EXECUTION

#### 3.01 ANCHOR BOLTS

- A. Existing Concrete Construction:
  - 1. Anchor Bolts (Expansion Type): Use only where necessary to support piping, ductwork, and anchor non-rotating equipment from existing concrete slabs and walls and for rotating equipment with anchor bolts in tension. Install expansion type anchor bolts in holes drilled in concrete. Install anchor bolts through concrete equipment pads, installed into existing structural concrete slabs.
  - 2. Anchor Bolts (Epoxy Type): Use only where necessary to anchor rotating equipment from existing concrete slabs and walls. Install adhesive type anchor bolts in holes drilled in concrete. Install anchor bolts through concrete equipment pads, installed into existing structural concrete slabs. Do not use adhesive type anchor bolts in tension.
  - 3. Powder actuated inserts are not acceptable.

#### 3.02 SUPPORT CHANNELS

- A. Attachment of Hangers to Channels: Provide manufacturer's standard locking type inserted nuts, of same manufacturer as channel.
- B. At locations indicated and wherever groups of three pipes or more in a 24-inch width are suspended from slabs, provide support channels bolted to concrete inserts embedded in slab; length to extend across pipes and 6 inches beyond outermost pipes; suspend hangers for piping from these channels.
- C. Locations of Channels: Parallel to walls; spacing 8 feet on centers maximum in general, measured along length of pipe.
- D. Attachment of Channels to Slab: Attach to inserts in slab on 36 inch maximum spacing with one attachment to embedded insert within 3 inches of end of each channel.

#### 3.03 GUY WIRES, FITTINGS, AND HARDWARE

- A. Stress guy wires until taut.

#### 3.04 ELECTRIC HEAT TRACING

- A. Provide heat tracing on the following:

1. Non-potable domestic water (NPW) piping, valves and appurtenances located outside.
- B. Install heat tracing in accordance with NFPA 70B, National Electric Code, Article 427 "Fixed Electric Heating Equipment for Pipelines and Vessels." Provide disconnecting means and ground fault circuit breaker for each circuit.
- C. Install in conformance with manufacturer's recommendations.
- D. Testing: Perform insulation resistance test. Test shall be performed prior to installation of thermal piping insulation. Test shall be witnessed by Owner and Engineer. Perform insulation resistance test between bus wire and shield in accordance with manufacturers recommendations. Test voltage shall be the lesser of the cable manufacturer's written instructions or 2500 volts DC. Test duration shall be one minute per cable. Insulation resistance shall be the greater of the cable manufacturer's written instructions or 1000 megohms, regardless of length.
- E. Coordinate location of power service. Make necessary connections. Provide labels on piping per NEC requirements.

### 3.05 EQUIPMENT, PIPING, AND VALVE IDENTIFICATION

- A. Valve Tags, General: Valves on new piping lines shall be provided with valve tags where destination is not visible from valve. Valve tags shall contain the following information.
  1. Valve Numbers with a Description of Function: Function shall be indicated on valve tag.
  2. A typewritten list of tag numbers, showing specific valve location and specific list of rooms affected by valve operation, shall be included in each operation and maintenance manual.
  3. Each valve tag shall be numbered chronologically by system and applicable tag number shall be indicated on as-built drawings. Valve numbering system shall conform to Owner's existing system.
- B. Nameplates: Provide for each piece of new equipment, controller, and other device including any special instruction for its use. Each equipment nameplate shall have equipment identification number.
- C. Identification of New Piping:
  1. Piping, which is accessible for maintenance operations, including piping concealed above suspended ceilings, shall be identified with pipe markers.
  2. Direction of flow arrows shall be included on each identification marker. Wrap directional flow arrow tape full circumference of pipe over each end of identification marker.
  3. Locations for Pipe Markers, General:
    - a. Adjacent to each valve.
    - b. At 12-foot centers maximum for length of pipe, but at least one per room.
    - c. At least one marker between any two partitions.
    - d. Pipe markers shall be visible from floor level.
- D. Labeling Schedule:

Outside Diameter of Pipe or Covering	Minimum Length of Color Band	Minimum Size of Letter
1/2 inch to 1-1/4 inch	8 inch	1/2 inch

Outside Diameter of Pipe or Covering	Minimum Length of Color Band	Minimum Size of Letter
1-1/2 inch to 2 inch	8 inch	3/4 inch
2-1/2 inch to 6 inch	12 inch	1-1/4 inch

- E. Identification Marker Color Coding and Marking (Match existing coloring and label scheme as available):

Pipe Contents	Band Color	Letter Color	Marker Wording
Non-Potable Domestic Water	Green	White	NPW
Condenser Water Supply	Green	White	CWS
Condenser Water Return	Green	White	CWR

3.06 SLEEVES, CORED OPENINGS, AND SEALING OF PIPING

- A. Size of Sleeve or Cored Opening: Unless specified otherwise, provide an annular clear space of approximately 1/4 inch for bare pipe sleeves; 1/2 inch for sealed sleeves. Provide insulation and covering continuous through sleeve.
- B. Exterior Concrete Walls Above Grade:
  - 1. Where insulated pipes pass through openings in concrete walls, seal annular space between aluminum jacket over insulated pipe and sleeve in exterior wall with elastic waterproof cement that dries to a firm but pliable mass.
- C. Exterior Walls Above Grade: Where pipes pass through openings in walls, seal annular space between pipe and sleeve in exterior wall with an elastic waterproof cement which will dry to a firm but pliable mass.

3.07 EQUIPMENT AND PIPING INSTALLATION

- A. Welding to Building Structural Members: Not allowed except where approved and as indicated on Drawings.
- B. Provide supports for equipment, piping, and appurtenances as required, including braces as required for seismic restraint; these include frames or supports for pumps and fans. Steel framework exposed to weather shall be galvanized after fabrication.
- C. Hangers and supports shall be hot-dip galvanized where located outside.
- D. Manufacturer's Instructions: Equipment, including ductwork and piping appurtenances, shall be installed in strict accordance with manufacturer's instructions.
- E. Floor-Mounted Equipment, General:
  - 1. Provide machine and floor or foundation fastenings; set equipment on concrete pads. Provide equipment base drawings, bolt-setting information, and anchor bolts for floor mounted equipment.
  - 2. Install equipment at locations and to dimensions indicated. Set equipment accurately with principal centerlines, and level using manufacturer's leveling screws, blocks, shims, or wedges. Do not distort equipment or baseplates.

- F. Suspended Equipment and Piping: Supporting elements shall be suitable for stresses imposed by systems, with a safety factor of not less than 5.0.
1. Supports shall not be anchored to metal decking.
  2. Supporting elements not shown or specified shall be provided in accordance with SMACNA and NFPA standards. Piping and equipment supports, not otherwise detailed, shall conform to applicable provisions of MSS SP-58.
  3. Where it is necessary to frame structural members between existing members or where structural members are used in lieu of commercially rated supports, such supplementary steel shall be provided in accordance with AISC Specification for Design, Fabrication and Erection of Structural Steel for Buildings.
  4. Welding of structural members, where approved, shall be in accordance with AWS D.1.1.
  5. Vibration isolation provisions shall be as indicated or specified.

END OF SECTION

SECTION 23 05 00

PIPE, VALVES, AND FITTINGS FOR HVAC

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Work of this Section includes piping, fittings, valves, supports, hangers, and miscellaneous system accessories.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's data for each product used.
- B. Test and Evaluation Reports:
  - 1. Flushing procedures.
  - 2. Chemical treatment procedures.
  - 3. Pressure tests.
- C. Certificates: Submit manufacturer's current certification sheets stating that pipe, tubing, fittings, valves, gaskets, and strainers are from an ISO 9000 certified manufacturer.

1.03 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC Specification for Design, Fabrication, and Erection of Structural Steel for Buildings.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. General: Pipe, tubing, fitting, valve, gasket, and strainer manufacturers listed below are acceptable. Pipe, tubing, fitting, valve, gasket, and strainer manufacturers listed are acceptable if manufacturer is an ISO 9000 certified manufacturer.
  - 1. Steel Pipe: U.S. Steel, Wheatland, California Steel, Northwest Pipe, IPSCO, Koppel, or Sharon.
  - 2. Copper Tubing: Mueller, Elkhart Products Corporation, Cerrotube, or Cambridge-Lee Industries.
  - 3. Fittings: Nibco, Mueller, Elkhart Products Corporation, Grabler, Stockham, Walworth, Tube Forgings, Crane, Bonney Forge, Victaulic, Anvil International, Grinnell Mechanical Products, Wheatley, Metraflex, Weld Bend, Capitol, Ameriforge, Boltex, Mills Iron Works, Penn Machine, Commercial Flanges, Ward, or Aeroquip.
  - 4. Valves: Centerline, Victaulic, Jenkins, Walworth, Kennedy, Stockham, Anvil International, Nibco, Milwaukee, Powell, Dezurick, Homestead, Watts Regulator, Rockwell-McCanna, Kitz, Red-White, Wheatley, Worcester, FNW, or Mueller.
    - a. Nibco butterfly valves are not allowed in heating water systems.
  - 5. Gaskets: Crane, Garlock, U. S. Rubber, Anchor, or Flexitallic.
  - 6. Strainers: Armstrong, Keckley, Metraflex, McAlear, Sarco, Hoffman, Crane, Wheatley, Watts, Mueller, Anvil International, Grinnell Mechanical Products, or Victaulic.
- B. Substitutions: When requesting a substitution for pipe, tubing, fitting, valve, gasket, and strainer manufacturers, submit a current certification sheet with substitution request

stating that pipe, tubing, fittings, valves, gaskets, and strainers are from an ISO 9000 certified manufacturer.

## 2.02 STEEL PIPING - GENERAL

- A. Pressure Ratings: Provide pipe, fittings, accessories, and other components with minimum pressure rating of 150 psig at 230 degrees F.
- B. Pipe: Black steel conforming to requirements of ASTM A53/A53M, Type E (electric-resistance-welded) or Type S (seamless), Grade A or Grade B, standard weight unless otherwise specified.
- C. Fittings:
  - 1. 2 Inches and Smaller:
    - a. Threaded: Class 150 threaded fitting conforming to requirements of ASME B16.3; black malleable iron conforming to requirements of ASTM A197/A197M.
    - b. Welding: Class 3000 socket-welding fitting conforming to requirements of ASME B16.11; carbon steel forging conforming to requirements of ASTM A105/A105M.
  - 2. 2-1/2 Inches and Larger:
    - a. Welding: Buttwelding fitting conforming to requirements of ASME B16.9; standard weight, seamless wrought carbon steel conforming to requirements of ASTM A234/A234M Grade WPB. Fitting wall thickness shall match pipe wall thickness.
    - b. Grooved Joint: UL listed and FM approved couplings and fittings. Victaulic or equivalent of Anvil International or Grinnell Mechanical Products is acceptable. All couplings and fittings shall be provided by same manufacturer.
      - 1) Couplings: Ductile iron conforming to requirements of ASTM A536 Grade 65-45-12; ethylene propylene diene monomer (EPDM) gaskets conforming to requirements of ASTM D2000 and NSF 61 for hot and cold potable water applications; gaskets shall be suitable for fluid carried in pipe; gaskets shall be rated to operate within a temperature range of minus 30 degrees F to 250 degrees F; carbon steel bolts and nuts conforming to requirements of ASTM A183.
      - 2) Fittings: Fittings and tees constructed of ductile iron conforming to requirements of ASTM A536 Grade 65-45-12 or black steel conforming to requirements of ASTM A53/A53M, Type E (electric-resistance-welded) or Type S (seamless), Grade A or Grade B.
- D. Unions:
  - 1. 2 Inches and Smaller: Class 150 threaded union conforming to requirements of ASME B16.39; malleable iron conforming to requirements of ASTM A197/197M, brass seat.
  - 2. 2-1/2 Inches and Larger: Use flanges.
- E. Flanges:
  - 1. 2 Inches and Smaller: Class 125 threaded flange conforming to requirements of ASME B16.1; gray cast iron conforming to requirements of ASTM A126, Class B.
  - 2. 2-1/2 Inches and Larger: Class 150 weld neck or slip-on flange conforming to requirements of ASME B16.5; carbon steel forging conforming to requirements of ASTM A105/A105M. Flange neck thickness shall match pipe wall thickness. Flanges facing flat faced gray cast iron flanges shall have flat face finish.



- F. Bolting: Hexagon head bolt conforming to requirements of ASTM A193/A193M, Grade B7 and ASME B16.5; hexagon nut conforming to requirements of ASTM A194, Grade 2H and ASME B16.5; dimensions shall conform to requirements of ASME B18.2.1 and ASME B18.2.2; coarse type threads shall conform to requirements of ASME B1.1.
- G. Gaskets: Nonmetallic gasket conforming to requirements of ASME B16.5 and ASME B16.21, 1/16 inch thickness. Inside bolt circle gasket for use with raised face flanges and full face type for use with flat face flanges. Garlock Style 3000, Durabla Durlon 8500 or approved equal.
- H. Joint Compound:
  - 1. 1 Inch and Smaller: Polytetrafluoroethylene (PTFE) pipe thread tape conforming to requirements of ASTM D3308 and NSF 61.
  - 2. 1-1/4 Inches and Larger: Lead free, non-toxic, non-hardening, pipe joint compound conforming to requirements of NSF 61 and Federal Specification TT-S-1732; Hercules Megaloc or equivalent of Rectorseal, La-Co, or Oatey.
- I. Strainers:
  - 1. 2 Inches and Smaller: Cast bronze conforming to requirements of ASTM B62; wye pattern; threaded ends conforming to requirements of ASME B1.20.1 or grooved ends conforming to requirements of this Section; 20-mesh Type 304 stainless steel screen; minimum pressure rating of 150 psig at 230 degrees F. Submit pressure-temperature rating table or graph.
  - 2. 2-1/2 Inches and Larger: Cast iron; wye pattern; Class 125 flanged connection conforming to requirements of ASME B16.1 or grooved ends conforming to requirements of this Section; 20-mesh Type 304 stainless steel screen; minimum pressure rating of 150 psig at 230 degrees F. Submit pressure-temperature rating table or graph.
- J. Valves, 2 Inches and Smaller:
  - 1. Ball: Two-piece body conforming to requirements of MSS SP-110; full port; solid ball; bronze body; chrome-plated brass ball; brass stem; threaded end connections conforming to requirements of ASME B1.20.1; polytetrafluoroethylene (PTFE) seat and seal. Provide stem extension for use in insulated piping. Valve shall meet minimum pressure rating of 150 psig at 230 degrees F. Submit pressure-temperature rating table or graph.
- K. Valves, 2-1/2 Inches and Larger:
  - 1. Butterfly: Tapped lug or grooved end style, ductile iron body, EPDM coated ductile iron or aluminum bronze disc; with memory stop if indicated. Bubble tight to 150 psi.
    - a. Valves 4 Inches and Smaller: Provide notched plate and handle.
    - b. Valves 6 Inches and Larger: Provide worm gear operator with handwheel.
  - 2. [Provide chain wheel operators with chain for operation at 6'-0" above access level for valves which are located higher than 7 feet above access level.
    - a. Provide gear operators as required.]

## 2.03 COPPER PIPING - GENERAL

- A. Pressure Ratings: Provide pipe, tubing, fittings, accessories, and other components with minimum pressure rating of 150 psig at 230 degrees F.
- B. Tubing (Pipe), Aboveground: ASTM B88 Type L copper water tube, hard drawn.

- C. Fittings:
  - 1. Wrought copper solder fittings and threaded adapters, ANSI B16.22.
  - 2. Cast copper alloy solder joint fittings and threaded adapters, ANSI B16.18.
  - 3. Use of T-Drill fittings is not permitted.
  - 4. Cast bronze solder joint fittings and threaded adapters, ANSI B16.18.
- D. Unions:
  - 1. Wrought copper solder joint unions, ANSI B16.22.
  - 2. Cast copper alloy solder joint fittings, ANSI B16.18.
  - 3. Cast bronze solder joint fittings, ANSI B16.18.
- E. Flanges and Flanged Fittings: Cast bronze, 125 psig Class, ASME Standards.
- F. Bolting: Hex head bolts, ASTM A307, Grade B; hexagon nut, ASTM A194; dimensions per ANSI B18.2.1 and ANSI B18.2.2; coarse type threads per ANSI B1.1; bronze plated.
- G. Gaskets: ANSI B16.21 nonmetallic 1/16 inch thick. Garlock Style 3000.
- H. Joint Compound:
  - 1. 1 Inch and Smaller: Polytetrafluoroethylene (PTFE) pipe thread tape conforming to requirements of ASTM D3308 and NSF 61.
  - 2. 1-1/4 Inches and Larger: Lead free, non-toxic, non-hardening, pipe joint compound conforming to requirements of NSF 61 and Federal Specification TT-S-1732. Hercules Megaloc, or equivalent of Rectorseal, La-Co, or Oatey.
- I. Solder: 95 percent tin, 5 percent antimony solder, ASTM B32 Harris "Bridgit" acceptable; certified to NSF 61. Laco flux or similar not permitted.
- J. Brazing Alloy: Silver brazing; Handy and Harmon "Sil-Fos" or equal of Harris, 1190 degrees F minimum melting temperature.
- K. Strainers: Cast bronze, Y-pattern, threaded or solder end; 20-mesh stainless steel (3/64 inch for 3 inch size) screen, 250 psi at 210 degrees F.
- L. Combination Ball Valve and Strainer 1-1/2 Inches and Smaller: At Contractor's option, use combination ball valve and strainer on pipe sizes 1-1/2 inch and smaller in lieu of a separate ball valve and a separate strainer.
  - 1. Griswold Controls combination ball valve and strainer.
- M. Valves:
  - 1. Ball: Two-piece body conforming to requirements of MSS SP-110; full port; solid ball; bronze body; chrome plated brass ball; brass stem; threaded end connections conforming to requirements of ASME B1.20.1; polytetrafluoroethylene (PTFE) seat and seal. Provide stem extension for use in insulated piping. Valve shall meet minimum pressure rating of 150 psig at 230 degrees F. Submit pressure-temperature rating table or graph.
  - 2. Butterfly: Victaulic Series 608 with ductile iron disk with elastomeric coating, wrought copper or cast bronze body; bubble tight shutoff to 300 psi.
  - 3. Provide chain wheel operators with chain for operation at 6'-0" above access level for valves which are located higher than 7 feet above access level.
    - a. Provide gear operators as required.
  - 4. Provide extended stems for valves on insulated piping systems.

## 2.04 PVC PIPING – GENERAL

- A. Service: PVC piping shall only be used for indoor applications unless otherwise approved by the Engineer of Record.
- B. Pressure Ratings: Provide pipe, tubing, fittings, accessories, and other components with minimum pressure rating of 280 psig at 73 degrees F.
- C. Tubing (Pipe), Aboveground: ASTM D1785 SCH 80 PVC.
- D. Fittings: Fittings shall conform to the dimensional requirements of schedule 80.
- E. Coatings: PVC piping that will be exposed to UV light shall be provided with a Factory applied UV resistant coating.

#### 2.05 DIELECTRIC FITTINGS

- A. Provide at each joint between dissimilar metals.
  - 1. 2 Inches and Smaller: 6" brass nipples.
  - 2. 2-1/2 Inches and Larger: Dielectric flange fittings conforming to requirements of ANSI B16.42 (iron) or ANSI B16.24 (bronze).
  - 3. Manufacturer: Watts 3000 Series, Epco, or equivalent.

#### 2.06 AIR VENTS

- A. Manual: All manual air vents on project shall be of same style.
  - 1. Manual air vents shall consist of a 1/4 inch ball valve with a 18" soft copper "candy cane" loop.
- B. Pressure/Temperature Test Ports:
  - 1. Acceptable Manufacturers: Peterson Equipment Company Type XL "Pete's Plugs II", Sisco equivalent.
  - 2. All brass construction, 500 psig maximum working pressure at 200 degrees F, 1/4 inch NPT.
  - 3. Provide extension for insulated lines.
  - 4. Provide extension for minimum 6 inch insertion depth.

#### 2.07 FLEXIBLE CONNECTORS

- A. Hydronic Systems: Mason types specified; equal of Unisource, Wheatley, Korfund, Amber Booth, Keyflex, or Redflex acceptable. Provide control cables for flexible connectors where piping is not anchored on both sides of connector per manufacturer's recommendation. Install flexible connectors in accordance with manufacturer's written instructions.
  - 1. 1-1/4 Inches and Smaller: Mason "Safeflex" Type SFU; single sphere; 235 psi pressure rating at 210 degrees F; constructed of multi-layered Kevlar tire cord fabric reinforcement with peroxide cured EPDM cover, liner, and fabric frictioning; with threaded ductile iron pipe flanges.
  - 2. 1-1/2 Inches and Larger: Mason "Safeflex" Type SFDEJ; double sphere; 235 psi pressure rating at 210 degrees F; constructed of multi-layered Kevlar tire cord fabric reinforcement with peroxide cured EPDM cover, liner, and fabric frictioning; with ductile iron floating flanges.

#### 2.08 THERMOWELLS

- A. Thermowells shall be sized to match thermometer stem; brass construction; length sufficient to cover the thermometer sensing bulb depth inside the pipe a minimum of two

thirds of the pipe inside diameter; extension neck length shall extend 1 inch beyond the insulation jacket.

2.09 THERMOMETERS

- A. Pipe: American, Ashcroft, Palmer, Trerice, Weksler, Weiss Instruments, Wika, Marshalltown; industrial grade; separable socket construction, red-reading mercury, 9 inch scale length; range 0 to 100 degrees F for chilled water piping, 0 to 100 degrees F for secondary chilled water piping, and 0 to 160 degrees F for condenser water piping.

2.10 PRESSURE GAGES

- A. Manufacturer: Ashcroft, Trerice, Wika, or Weksler.
- B. Provide 4-1/2 inch size, stem mounting with cast metal case without back flange with cast metal threaded ring. Range approximately twice normal operating pressure, with uniformly spaced graduations.
- C. Connect through 1/2 inch nipple, gage valve and reducer.

2.11 HOSE END DRAIN VALVES

- A. 125 psig working pressure, bronze body, composition seat, threaded or solder joint ends, with 3/4 inch hose thread adapter; lockshield and removable handle, Nibco Figure 72 or 74 or approved equal.

2.12 PIPE HANGERS AND SUPPORTS

- A. Conform to requirements of MSS SP 58.
- B. Manufacturers: Anvil International, Tolco, Basic Engineering Inc., B-Line, ERICO/Michigan Hanger, PHD, or Pipe Shields.
- C. Materials:
  - 1. Hanger Material: Match piping material at point of contact with piping.
    - a. Black Steel Pipe: Carbon steel, cast iron, or malleable iron.
    - b. Galvanized Steel Pipe: Carbon steel, cast iron, or malleable with zinc coating.
    - c. Copper Tubing: Carbon steel or malleable iron with copper finish or carbon steel or malleable iron with plastic coating.
    - d. Cast Iron Pipe: Carbon steel, cast iron, or malleable iron.
  - 2. Pipe hangers and hanger rods exposed to the weather shall be galvanized.
  - 3. [Underground pipe hangers and hanger rods shall be galvanized. Provide coating conforming to requirements of Section [200300] [20 0300] [20 03 00].]
- D. Hanger Rods: Hot rolled steel rod, ASTM A36; size to "Code for Pressure Piping", ANSI B31.1, with safety factor of 5; hanger rod size and maximum load listed below.

<u>Rod Diameter</u> <u>(Inches)</u>	<u>Pipe Size</u> <u>(Inches)</u>	<u>Load</u> <u>(Pounds)</u>
3/8	2 and smaller	610
1/2	2-1/2 and 3-1/2	1,130
5/8	4 and 5	1,810
3/4	6	2,710
7/8	8 to 12	3,770

<u>Rod Diameter</u> <u>(Inches)</u>	<u>Pipe Size</u> <u>(Inches)</u>	<u>Load</u> <u>(Pounds)</u>
1	14 and 16	4,960
1-1/4	18 to 20	8,000
1-1/2	24	11,630

- E. Insulation Saddles and Inserts:
1. Saddles: Anvil International Figure 160-166A, size to match insulation thickness.
  2. Inserts for Piping, Except for Refrigerant Piping: Pipe Shields Inc.; inserts shall consist of high density calcium silicate treated with water repellent in a galvanized sheet steel jacket, both split to fit around the pipe, providing 360 degree coverage and capable of supporting the pipe weight without distortion. The calcium silicate shall be the same thickness as the pipe insulation. The calcium silicate shall extend no less than 1 inch beyond the metal shield ends on cold piping for an effective vapor barrier joint with the pipe insulation.
- F. Hanger Selection:
1. Bare Pipe: Select to fit outside diameter of pipe.
  2. Insulated Pipe: Select to fit outside diameter of insert.
- G. Ring Hangers: Anvil International Figure 69 or 104.
- H. Clevis Hangers: Anvil International Figure 260.
- I. Pipe Stanchions: Anvil International Figure 63 or equal of Tolco, Basic Engineering Inc., B-Line, ERICO/Michigan Hanger, or PHD; galvanized steel construction.
- J. Pipe Hangers at Wall:
1. Pipe 2-1/2 Inches and Smaller: Malleable iron one-hole clamp Anvil International Figure 126.
  2. Pipe 3 Inches and Larger: Wall bracket, Anvil International Figure 194, 195, or 199 for pipe rings and rod hangers specified herein.
  3. Loads not to exceed ratings shown in manufacturer's catalog.
- K. Pipe Hangers for Vertical Piping:
1. Pipe 1 Inch and Smaller: Steel preformed metal framing, Unistrut P1100 Series with Series P2024 clamps for outside diameter tubing and P2558 Series for pipe; galvanized finish unless indicated otherwise.
  2. Pipe 2-1/2 Inches and Smaller: Steel preformed metal framing, Unistrut P1100 Series framing with P2558 Series pipe straps; galvanized finish unless indicated otherwise.
  3. Pipe 3 Inches and Larger: Anvil International Figure 261 riser clamp at each floor penetration, intermediate supports Figure 256 pipe alignment guide.

## 2.13 STRUCTURAL STEEL

- A. Structural Steel Members: ASTM A36.
- B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- C. Welders for structural steel shall have welder's certificates verifying AWS qualification within the previous 12 months.

## 2.14 TREATMENT SPECIALIST

- A. Cleaning, flushing, and chemical treatment of piping systems shall be performed under the constant supervision of a treatment specialist. Contractor shall hire the treatment specialist and pay costs.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. General:
  - 1. Diagrams: Diagrams showing pipe connections are schematic only. Do not use for calculating lineal runs or numbers and types of fittings.
  - 2. Headroom:
    - a. At ceilings, maintain the maximum possible headroom. Employ carefully planned arrangements to give the best results.
    - b. In areas of egress, maintain a headroom of 7 feet from the floor to the bottom of an obstruction.
  - 3. Install piping promptly, capping or plugging open ends and making pipe generally level and plumb (unless noted otherwise), free from traps, and in a manner to conserve space for other work.
  - 4. Inspect each piece of pipe, tubing, fittings, and equipment for defects and obstructions; promptly remove defective material from the jobsite.
  - 5. Install pipes to clear beams and obstructions; do not cut into or reduce the size of load carrying members.
  - 6. Use long radius elbows wherever possible.
  - 7. Install piping in accordance with ASME B31.9 "Building Services Piping" and as specified herein.
- B. Location of Pipe: Piping layout as shown is diagrammatic indicating general arrangement. Determine measurements at jobsite, accurately cutting pipe to suit. Locate piping to avoid interference with building structural members, equipment, and building openings; provide access for operation, service, disconnection, removal and replacement of valves, fixtures, and equipment. Within buildings, conceal piping in walls and above ceiling except where indicated to remain exposed.
- C. Cleaning: Clean interior of piping before making joints and placing in position by blowing clean with steam or compressed air. Maintain cleanliness of piping throughout installation; provide caps or plugs on open ends of cleaned piping.
- D. Unions, Flanges, and Fittings: Provide unions or flanges at valves, fixtures, and equipment if a means of disconnection is not otherwise provided. Provide reducing fittings for changes in pipe size; bushings are not acceptable. Use fittings for changes in direction of piping.
- E. Routing: Run parallel to column lines and perpendicular to the floor unless shown otherwise on Drawings.
- F. Leaks: Correct immediately, using new materials; leak-sealing compounds not permitted.
- G. Position of Gate Valves and Globe Valves: Install stem horizontal or above.
- H. Pressure/Temperature Test Ports: Install test port horizontal or above.

- I. Concealed Piping: Install piping as concealed Work in finished areas, unless indicated otherwise. Do not cover up or enclose Work until properly and completely inspected and reviewed. Should Work be covered up or enclosed prior to inspections and reviews, uncover Work as required and, after completely inspected and reviewed, make repairs and replacements with materials as necessary and at no additional cost to Owner.
- J. Dielectric Nipples and Flanges: Provide dielectric nipples or flanges at each joint between dissimilar metals, except that bronze valves and fittings may be used without dielectric nipples or flanges for ferrous-to-ferrous or non-ferrous-to-non-ferrous connections.
- K. Slope and Connections: Pitch condenser water piping mains not less than 1 inch in 40 feet up in direction of flow unless specifically noted otherwise. Risers shall be straight and plumb. Install eccentric reducers approximately 3 feet beyond last branch where main changes size to avoid trapping air in main.
- L. Hose End Drain Valves: Provide at low points of systems and as indicated. This shall include points upstream and downstream of shutoff valves.
- M. Air Vents:
  - 1. Manual: Provide at high points of water systems generally and where indicated. This shall include points upstream and downstream of shutoff valves.
- N. Seismic Bracing: Conform to requirements of Section 23 00 00.
- O. Install and test piping and equipment in compliance with specified codes and Standards.
- P. Piping Supports;
  - 1. Use wall brackets where pipes are adjacent to walls or other vertical surfaces, which may be used for support.
  - 2. Install supports to adequately carry the load and still maintain proper alignment.
  - 3. Support piping to route expansion and contraction in the required direction.
  - 4. Set inserts and sleeves for supports in concrete where necessary before the concrete is poured.
  - 5. Riser clamps shall not be supported on floor sleeves. Provide means to support riser clamps from the floor slab.
- Q. Pipe Hangers and Supports:
  - 1. Unless specified or indicated otherwise, install hangers, supports, anchors, bolts, and mounting accessories for piping and equipment in accordance with MSS SP 58.
  - 2. Spacing of Horizontal Pipe Hangers:
    - a. Comply with the spacing requirements of MSS SP 58 and a support shall be installed not over 1 foot from the pipe fitting joint at each change in direction of the piping. For horizontally hung grooved end piping, provide a minimum of 2 hangers per pipe section.
    - b. Provide additional supports at concentrated loads, such as flanges, valves, and similar items.
  - 3. Vertical Piping: Route vertical piping in a manner such that it can be attached to adjacent walls or columns.
  - 4. Piping at Ceiling: Suspend piping at ceiling using steel rod hangers, with individual rods for each hanger, except where 2-rod suspension pipe roll supports are specified or indicated on Drawings.
  - 5. Piping Anchors, Guides, and Supports:
    - a. Support piping to route expansion and contraction in the required direction.

- b. Install sufficient guides and anchors to keep pipes in accurate alignment, to direct the expansion movement and to prevent buckling, swaying and undue strain.
  - c. Use hangers for supporting pipe 2 inches and larger that are fabricated to permit adjustment after erection while still supporting its load.
  - d. Use wall brackets where pipes are adjacent to walls or other vertical surfaces which may be used for support.
  - e. Install supports to adequately carry the load and still maintain proper alignment.
  - f. Set inserts and sleeves for supports in concrete where necessary before the concrete is poured.
  - g. Riser clamps shall not be supported on floor sleeves. Provide means to support riser clamps from the floor slab.
6. Beam clamps shall be complete with retaining straps.
- R. Insulation Saddles and Inserts:
- 1. Insulated Piping 6 Inches and Larger: Provide saddles between hangers and bottom quadrant of pipe; [provide saddles between pipe support rollers and bottom quadrant of pipe;] weld to the pipe.
  - 2. All Other Insulated Piping: Provide factory fabricated insulation inserts with split metal jacket. Install inserts prior to installing insulation.
- S. Joints:
- 1. Threaded:
    - a. Produce sufficient lengths of perfect threads to ensure full metal-to-metal contacts when screwed into fittings; countersink, ream and clean ends of pipes of chips and burrs after threading.
    - b. Make up full connections with not more than one full thread exposed, by such method that will not subject pipes or fittings to twisting or cross strains; lubricate male threads only with joint compound.
  - 2. Brazed and Soldered: Cut ends square and remove fins and burrs. Replace dents and damaged tubing with new tubing. Remove grease and oil from joints by wiping with clean cloth saturated with a suitable chemical solvent and then clean with emery cloth. After cleaning apply non-corrosive flux, apply heat and solder and hold joint rigidly until solder or brazing alloy has hardened. Wipe excess solder from exterior of joint before hardening. Before soldering or brazing, remove stems and washers of solder joint valves.
  - 3. Grooved Joint Couplings:
    - a. Check pipe to be certain it is sufficiently free of indentations, projections, grooves, weld seams, or roll marks on the exterior of the pipe over the entire gasket seating area to ensure a leak-tight seat for the gasket. Check that pipe ends are square cut and that penetration is in accordance with Victaulic, Anvil International, or Grinnell Mechanical Products manufacturer's standards.
    - b. Provide gaskets of the central cavity pressure-responsive design. Gasket style and grade shall be checked to be certain gasket supplied is suited for the intended service.
    - c. Provide lubrication for proper coupling/fitting assembly as follows.
      - 1) Lubricate gasket exterior including the lips and/or pipe ends and housing interiors, to prevent pinching the gasket and for proper gasket seating and alignment during installation.
      - 2) Use Victaulic lubricant or equal of Anvil International or Grinnell Mechanical Products for installation. Other compatible materials such as silicone and others may be used, however, petroleum based lubricants must not be used on Grade "E" or "M" gaskets.
      - 3) Apply a thin, uniform coat of lubricant as follows.



- a) Brush lubricant on the gasket lips (ID) and the entire exterior of the gasket.
  - b) Brush lubricant on the pipe ends around the entire pipe circumference and inside the coupling housing.
  - d. Provide new gaskets when existing couplings are taken apart and reinstalled.
- T. Pipe Thermometers and Thermowells: Locate and arrange thermometers to be easily read from the floor. Install thermometers in thermowells and fill thermowells with a heat transfer medium approved by the thermometer manufacturer.

### 3.02 CLEANING

- A. Flush piping after fabrication and prior to connecting into the existing systems and prior to pressure tests. Provide piping by-passes and temporary circulating pump as needed.
- B. Remove strainer screens during flushing except those protecting control equipment. Clean the screens protecting control equipment during flushing if necessary and after flushing is completed.
- C. Chemical Flushing:
  - 1. Chemically flush condenser water piping system with Hydrochem M283/M9 (sodium tripolyphosphate and sodium silicate) or equivalent.
  - 2. Dispose of chemicals to the sanitary sewer after neutralization.
- D. The cleaning solution shall be added via a bypass feeder or pump until a phenolphthalein alkalinity of 500 ppm is obtained. The solution shall be circulated for 2 hours. At the end of the cleaning period, a running flush shall be started and continued until the system water runs clear, clean of chemical, and is at the normal pH of fresh water.
- E. Submit a complete report of the flushing procedures.

### 3.03 SYSTEM STARTUP

- A. System Fill: Refill the condenser water system with pre-mixed 35% propylene glycol with inhibitors at the direction of the chemical treatment provider. Match existing chemical currently being used in the existing system. Bleed air from system highpoints.
- B. Submit a complete report of chemical treatment procedures.

### 3.04 FIELD TESTS

- A. General:
  - 1. Test new piping, piping systems and connected equipment. Test after the lines have been cleaned and prior to insulation.
  - 2. Isolate from existing systems by the closest valve or valves to the existing system.
  - 3. Furnish test equipment. Install a calibrated test pressure gage in the piping being tested.
  - 4. Prior to testing, remove or valve-off gages, traps, and other apparatus which may be damaged by testing.
  - 5. Make test in presence of the Owner and Engineer.
  - 6. Rectify defects which develop during testing and retest until approved by the Owner and Engineer at no additional charge to the Owner.
  - 7. Provide vents and drain valves as required to drain piping after testing.

- B. Test Requirements: Follow test requirements unless requirements are specified in individual Specification Sections.
  - 1. Pressure: 1-1/2 times design working pressure or 150 psig, whichever is the lesser.
  - 2. Time: Hold pressure to inspect joints and connections; not less than 15 minutes.
  - 3. Test joints in air-tested systems by brushing with a soapy water solution.
  - 4. Water test piping except refrigerant piping, compressed air piping, medical gas piping, medical vacuum piping, and natural gas piping with water less than 100 degrees F.
  
- C. Submit a complete report of testing procedures.

END OF SECTION

SECTION 23 05 93

TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The Work of this Section includes testing, adjusting, and balancing.

1.02 SUBMITTALS

- A. Reports:
  - 1. Testing and balancing certified reports.
- B. Certification: Certified individual qualifications of testing agency and persons from testing agency.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 CONTRACTOR'S WORK FOR TESTING, ADJUSTING, AND BALANCING

- A. General: Testing, adjusting, and balancing of cooling systems will be done at completion by a balancing firm employed by the Contractor. Perform related work as described.
- B. Work by Contractor:
  - 1. Before balancing and testing can commence, check fans, pumps, and other rotating equipment for proper rotation and lubricate per the manufacturer's recommendations and operate fans, pumps, and auxiliary equipment for a minimum of one week. During this period, Contractor shall ensure control components are checked out and calibrated under operating service; these components include, but are not limited to, thermostats to ensure they are connected to the appropriate device, respond to temperature changes, and are of the correct action to be compatible with the controlled device.
  - 2. Provide the following.
    - a. Access to valves, balancing devices, and safety devices, including ceiling tile removal and replacement.
    - b. Ladders, scaffolds, staging, and accessories required to gain access to dampers, valves and balancing devices.
- C. Work by Balancing Firm: Balancing firm will provide labor and instruments for the actual adjusting and testing work.

3.02 TESTING, ADJUSTING, AND BALANCING

- A. General:
  - 1. Testing, adjusting, and balancing shall comply with the requirements of the 2021 IECC.
  - 2. Obtain the services of a qualified testing agency that is a separate firm not financially connected to the Contractor and subcontractors. Prior to commencing Work under this Section of the Specifications, the testing agency shall have been

- approved by the Architect and shall be a certified member of the Associated Air Balance Council (AABC) or National Environmental Air Balancing Bureau (NEBB). Minimum qualifications for acceptance shall be the general membership standards of AABC or NEBB. Balancing agency and personnel shall be unrelated to the sale or installation of the system and the control equipment.
3. Procedures: Balancing shall be accomplished in accordance with schedules approved by the Architect. Procedures shall be in conformance with AABC "Test and Balance Procedures", NEBB "Testing, Adjusting or Balancing of Environmental Systems", except as supplemented and modified by this Section.
  4. Qualifications: Submit the name of the agency proposed to the Engineer for approval within the time limit specified in Contract Documents. The submittal shall further include the certified individual qualifications of persons responsible for supervising and performing the actual balancing, the name of the certifying engineer and the qualifications of the TAB professional licensed in the State of Montana certifying the report.
  5. Instruments: Instruments used for measurements shall be accurate and calibration histories for each instrument will be available for examination. Method of application of instrumentation shall be in accordance with the AABC or NEBB procedures.
- B. Water System:
1. Systems shall be adjusted to provide the approved pressure drops through the heat transfer equipment prior to the capacity testing.
  2. Where flow metering fittings are not installed, flow balance shall be determined by measuring temperature differential across the heat transfer equipment.
  3. Measurement of temperature differential shall be performed with the air system, adjusted as described herein, in operation.
  4. Flow: Flow through by-pass circuits at three-way valves shall be adjusted to balance that through the supply circuit.
  5. Adjust balance valves for equal flow thru the two banks of coils of the adiabatic cooler.
- C. Certified Reports: Three copies of the report covering water system balance shall be submitted to the Engineer, prior to final acceptance of the project. The reports shall be certified by a Registered Professional Engineer who is experienced in air and water balancing or by a certified member of the Associated Air Balance Council (AABC) or National Environmental Air Balancing Bureau (NEBB).

END OF SECTION

SECTION 23 07 19

HVAC INSULATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The Work of this Section includes insulation and accessories for piping systems and designated equipment.

1.02 DEFINITIONS

- A. Thickness: Normal thickness of insulation is defined as the thickness of the basic insulating medium not including finishing coats.
- B. Thermal conductivity is defined as Btu-inch/hour-square feet-degree F.
- C. Cold Piping: Non-Potable Domestic Water Piping (NPW).

1.03 SUBMITTALS

- A. Product Data: All materials.

1.04 QUALITY ASSURANCE

- A. Fire Resistance:
  - 1. Insulation, Tape, Adhesives, Vapor Barrier Materials, and Jackets: Flame spread and smoke developed ratings shall conform to requirements of ASTM E84; not more than 25/50.

PART 2 - PRODUCTS

2.01 INSULATION CHARACTERISTICS

- A. Manufacturer: Owens-Corning, CertainTeed, Johns Manville, or Knauf.
- B. Pipe Insulation:
  - 1. Fiberglass: Suitable for pipe temperature from 0 degrees F to plus 800 degrees F; one piece type with only one longitudinal joint; thermal conductivity not greater than 0.24 Btu-inch/hour-square feet-degree F at 75 degrees F mean temperature. Provide factory applied all-service jacket.
    - a. Factory Applied All-Service Jacket for Fiberglass Insulation: White kraft paper outer surface bonded to aluminum foil vapor barrier, suitable for painting. Kraft paper permanently treated for fire and smoke safety and to prevent corrosion of the foil. Factory applied pressure sensitive closure system for permanent seal of laps and butt strips.
- C. Insulation for Valves 2 Inches and Smaller, Fittings, Flanges, Grooved Joint Pipe Couplings, and Unions:
  - 1. Fiberglass: Owens-Corning Type TIW wool type wrap, Johns Manville HTB 26 insulation blanket, or resilient glass fiber strips to same thickness of adjacent pipe insulation. Provide with PVC covers.
    - a. PVC Covers: Factory pre-molded one-piece PVC covers.

- D. Insulation for Valves 2-1/2 Inches and Larger, Flexible Connectors, and Unions :
  - 1. Fiberglass: Flexible removable fiberglass blanket fabrication of a sandwich section of fiberglass batt (1 pound per cubic foot density), same thickness as adjacent pipe insulation, enclosed in glass cloth cover machine sewed at the ends; provide stainless steel two-hole lacing hooks and sew hooks to blanket; provide stainless steel wire for lacing the blanket.

## 2.02 METAL JACKETS

- A. Metal Jackets: 0.016 inch thick stucco embossed aluminum with integral vapor barrier. The interior of the jacket shall be protected by a factory heat sealed co-extruded polysurlyn film consisting of three layers for a total thickness of 3 mils.
  - 1. Metal jackets shall be factory premolded wherever possible.

## 2.03 INSULATION SPECIALTIES

- A. Joint Tape: Glass fiber reinforced, aluminum foil and kraft paper laminate with vapor barrier characteristics comparable to insulation facing.
- B. Finishing Cement: Hydraulic setting, low shrinkage insulating and finishing cement for one coat finish, suitable for painting with water base paint.
- C. Insulating Cement: Mineral fiber cement suitable for application on metal in single layers up to 4 inches thick.
- D. Vapor Barrier Adhesive: Vapor barrier lap sealing adhesive, Foster 85-20, Childers CP-82, or approved equal.
- E. Lagging Adhesive: Foster 30-36, Childers CP-50AMV1, Miracle LA69, Arabol, or approved equal.
- F. Mold Resistant Lagging Adhesive: Foster 30-36 AF; Childers CP-137 AF; shall meet ASTM D5590 with 0 growth rating.
- G. Vapor Barrier Coating: Foster 30-80, Childers CP-38, or Vimasco 749 water based vapor barrier coating, or approved equal. Maximum perm rating of 0.08 perms or less at 37 mils dry tested at 100 degrees F and 90 percent RH per ASTM F1249.
- H. Mold Resistant Vapor Barrier Coating: Foster 30-80 AF. Coating shall meet ASTM D5590 with 0 growth rating. Maximum perm rating of 0.08 perms or less at 37 mils dry tested at 100 degrees F and 90 percent RH per ASTM F1249.
- I. Metal Jacketing Sealant: Sealant used in metal jacketing seams to prevent water entry, Foster 95-44 or approved equal.
- J. Insulation Inserts: Conform to requirements of Section 23 05 00.
- K. Insulation Bands: 3/4 inch wide, 26 gage stainless steel.
- L. Wire: Soft annealed stainless steel, 16 or 18 gage.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Install with joints tightly butted. Tuck and tuft edges of insulation. Maintain vapor barrier when butting insulation to inserts.
- B. Install insulation to allow easy access to equipment for inspection and repairs.
- C. Remove loose dirt, rust, other loose foreign material, moisture and frost from surfaces prior to installing insulation.
- D. Apply insulation only after piping has been tested, except as specified otherwise for elastomeric insulation and after electric heat tracing has been installed. Electric heat tracing is specified under Section 23 00 00.
  - 1. Oversize pipe insulation to allow for electric heat tracing where applicable.
- E. Piping, General:
  - 1. Provide insulation continuous through floor, wall, and ceiling openings and sleeves.
  - 2. In order to prevent condensation formation under normal operation, apply insulation with continuous, unbroken vapor seal throughout each entire cold piping system. Refer to definition of cold piping in Part 1 of this Section. Adequately insulate and vapor seal hangers, supports, and anchors that are secured directly to cold surfaces to prevent condensation.
  - 3. Apply specific adhesives, mastics, and coatings at the manufacturer's recommended minimum coverage per gallon.
  - 4. Provide insulation in the space between the pipe and the pipe saddle.
  - 5. Inserts: Overlap adjacent insulation jacket a minimum of 1 inch on insulation inserts and securely cement in place.
- F. Fiberglass Insulation:
  - 1. Fiberglass Insulation for Pipes: Apply insulation over clean, dry pipe with joints butted firmly together. Smoothly secure longitudinal jacket laps and butt strips according to manufacturer's recommendations.
  - 2. Fiberglass Insulation for Valves 2 Inches and Smaller, Fittings, Flanges, Grooved Joint Pipe Couplings, and Unions: Apply insulation and install PVC covers. Staple and seal seam edges of the one-piece PVC cover with vapor barrier adhesive applied over insulation. Tape circumferential edges of cover with vapor barrier pressure sensitive tape to match fitting cover color. The tape shall extend over the adjacent piping insulation and have an overlap on itself at least 2 inches.
    - a. Unions: Each union shall have a separate PVC fitting cover. Write the word "UNION" on each PVC union cover with a permanent black felt marking pen. Use removable insulation segments. Arrange segments to permit access to union by slitting tape at the joints.
  - 3. Fiberglass Insulation for Valves 2-1/2 Inches and Larger, Flexible Connectors: Apply flexible removable fiberglass blanket insulation and glass cloth cover jacket.
    - a. Unions: Each union shall have a separate PVC fitting cover. Write the word "UNION" on each union cover with a permanent black felt marking pen. Use removable insulation segments. Arrange segments to permit access to union by slitting tape at the joints.
    - b. Strainers: Each strainer shall have a separate PVC fitting cover. Use removable insulation segments. Arrange segments to permit access to strainer removal cap or plug by slitting tape at the joints.
    - c. Piping Components in Cold Piping Systems: Apply vapor barrier coating over exterior surfaces to provide a continuous vapor barrier.
- G. Metal Jackets:

1. Provide metal jacket on insulated piping and piping components located outside. At the penetration of exterior walls and roofs, extend the metal jacket through the sleeve to a point 2 inches beyond the interior surface of the walls and roofs.
2. Overlap transverse and longitudinal joints at least 1 inch and arrange to shed rain. Seal overlapped joints with metal jacketing sealant. Secure with aluminum bands.

3.02 ITEMS TO BE INSULATED AND JACKETED

- A. Piping:
1. Interior and exterior Non-Potable Domestic Water Piping (NPW) valves, and piping appurtenances.
  2. Exterior Condenser Water Supply and Return Piping (CWS/CWR) valves, and piping appurtenances.

3.03 ITEMS NOT TO BE INSULATED

- A. Piping:
1. Valve stems, handwheels, and operators.

3.04 INSULATION TYPE AND THICKNESS

- A. Pipe: Except where shown otherwise on Drawings or specified otherwise, insulate piping to the thickness listed in the following table..

Service	Type	Insulation Thickness for Pipe Sizes Shown (Inches)				
		Less Than 1	1 to Less Than 1-1/2	1-1/2 to Less Than 4	4 to Less Than 8	8 and Over
Non-Potable Domestic Water Piping (NPW): Interior and Exterior Piping	FG	1 (interior)	1 (interior)	n/a	n/a	n/a
		2 (exterior)	2 (exterior)	n/a	n/a	n/a
Condenser Water (Supply and Return Piping CWS/CWR): Exterior Piping Only	FG	1	1	2	n/a	n/a
(1) For piping 1-1/4 inch and smaller that has heat tracing (NPW) on it, use insulation that is oversized in diameter by 1/4 inch to allow for installation over the heat maintenance tape. Verify this requirement for these pipe sizes and all pipe sizes with the manufacturer of the heat maintenance tape actually provided. Coordinate with heat maintenance tape specified in Section 23 00 00.						

- B. Abbreviations:
1. FG - Fiberglass.

END OF SECTION



SECTION 23 09 23

DIRECT-DIGITAL CONTROL SYSTEM FOR PLUMBING AND HVAC

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The Work of this Section includes provision of additions and modifications to the existing DDC system including the design and provision of a direct digital control system to provide the required sequences of operation. Controls shall be integrated into the existing system. Provide design, programming, graphics creation, materials, and labor for a complete and operable system to matching existing.

1.02 RELATED REQUIREMENTS

- A. Section 01 79 00 – Demonstration and Training
- B. Section 23 60 00 – Central Cooling Equipment: DDC integration with Adiabatic cooling tower.

1.03 DEFINITIONS

- A. The following terms are utilized.
  - 1. Adjustable: Applies to values that the DDC operator can change from the Local Personal Computer (LPC) graphics screens.
  - 2. Algorithm: A logical procedure for solving a recurring problem.
  - 3. Analog: A continuously varying signal value (temperature, current, velocity, etc.).
  - 4. Binary: A two-state system where an “on” condition is represented by a high signal level and an “off” condition is represented by a low signal level.
  - 5. Deadband: A temperature range over which no heating or cooling energy is supplied, such as 72-78 degrees F, i.e. as opposed to single point changeover or overlap.
  - 6. Integration: Communication between DDC system and a microprocessor controlled piece of equipment where the microprocessor is not provided under this Section.
  - 7. Modulate: Adjust a damper, valve, or other control device incrementally to achieve a setpoint. This is in contrast to a 2-position control where the control device is either open or close, on or off, etc.
  - 8. Monitor: Input a physical quantity or status into the DDC and generate an alarm if the value of the measured quantity matches a pre-programmed alarm value or range of values.
  - 9. PID: Proportional, integral, and derivative control; the 3 types of action that are used in controlling modulating equipment.
  - 10. Reset: Programmatically change an intermediate setpoint in a cascaded control scheme to achieve the final desired temperature.
  - 11. Sequence: Control multiple devices to maintain a single setpoint such that each device is assigned to control a different range within the control band above and below the setpoint. For instance, heating valves open and dampers close when the temperature is below setpoint, and dampers open and heating valves close when the temperature is above setpoint.
  - 12. Setpoint: The target output value a loop control is attempting to achieve.
  - 13. Interlock: Operation of one piece of equipment in direct correlation to the operating schedule of a related piece of equipment. May be accomplished

through programming (software interlock) or via physical wiring (hardwired interlock). When not specified, software interlock shall be implied.

#### 1.04 COORDINATION

- A. Ensure installation of components is complementary to installation of similar components in other systems.
- B. Coordinate timing of submittals, delivery, and installation to meet the construction schedule.
- C. Coordinate installation of system components with installation of mechanical systems equipment.
- D. Coordinate DDC installation to equipment based on the actual equipment that is submitted and approved.
- E. Coordinate DDC system integration to equipment controllers with the manufacturer of equipment.
- F. Coordinate DDC communication system connection to network, including, but not limited to, application of hardware/software network, network addressing, and location of DDC communication system connection to network.
- G. Ensure system is completed and commissioned.
- H. Coordinate and support testing, adjusting, and balancing.

#### 1.05 PRE-INSTALLATION MEETINGS

- A. Attendance: Contractor, DDC subcontractor, electrical subcontractor, Owner, Engineer, manufacturer's representative, and those requested to attend.
- B. Equipment Controller Integration Coordination Meeting: Convene an equipment controller integration coordination meeting for each equipment type (e.g. adiabatic cooler) a minimum of 4 weeks prior to commencement of installation of each equipment type or DDC system.

#### 1.06 SUBMITTALS

- A. Product Data:
  - 1. Submit a complete list of equipment including a manufacturer's catalog sheet for each item used.
  - 2. Submit descriptions of software. Provide product numbers and cut sheets for each piece of software, including third party and operating system software. Designate the manufacturer of each software. Product cutsheets shall describe the standard and optional features of each product.
  - 3. Schedules: Valve schedules identifying valve size, fail-safe position, flow, Cv, actual pressure drop and equipment served. Damper schedules identifying damper size, damper configuration, fail-safe position and equipment served.
- B. Shop Drawings: Submit for approval a complete set of Shop Drawings. Include the following information.
  - 1. Interconnect Drawings:
    - a. Show field wiring for equipment and devices.

- b. Identify the type and size of wire.
    - c. Identify equipment and devices by the reference designations shown on the mechanical Drawings. Provide material list on each control drawing.
    - d. Schematics showing the general mechanical system layout with sensors, control valves, alarms, switches and all other devices. Indicate device setpoints and ranges.
    - e. Floor plan drawings showing location of control panels as scheduled, room sensors, computers, and controllers.
  2. Wiring Diagrams:
    - a. Show internal wiring of panels.
    - b. Show general physical arrangement of component devices installed in the panels.
    - c. Provide elementary ladder diagrams to show the function of circuits employing switching logic for each electric motor operated unit.
    - d. Provide panel schedule showing location, systems served and point count.
  3. DDC Communication System Diagrams: Provide information on DDC communication system, including, but not limited to, the following.
    - a. Single line diagram showing the following.
      - 1) Location of network routing hardware (e.g. switches and routers).
      - 2) Location of standalone DDC panels, workstations, and other DDC equipment connected to the DDC communication system.
      - 3) Location of DDC communication system connection to building IT network.
    - b. Internet Protocol (IP) addresses.
    - c. Schedule for DDC communication system installation, cutover, and testing.
  4. Sequence of Operations: Provide a written narrative of the sequences of operations. Sequence of operations shall be readable in plain English. Do not substitute program text or diagrams for written sequence of operations. Base the shop drawing sequence of operations on the sequence of operations shown on Drawings. Sequences of operations shown on Drawings do not include all necessary details for programming. Add detail to the shop drawing sequence of operations including, but not limited to, the following.
    - a. Description of each logical step used to control operational loads, including startup, warmup, cooldown, purge, demand limit, smoke control, shutdown, etc.
    - b. Description of determination of status.
    - c. Description of when PID control loops are applied.
    - d. Suggested schedule parameters, if not stated on Drawings.
    - e. Suggested reset calculation parameters, if not stated on Drawings.
- C. Test and Evaluation Reports:
  1. Provide point-to-point test, sequence of operations test, and field quality control and testing plans. Test plans shall be used in final acceptance to verify operation of points and control functions specified.
  2. Submit a complete field quality control and testing report including test procedures and results to the Owner and Engineer 10 days prior to commencement of commissioning.
- D. Manufacturer's Installation Instructions: Include for manufactured components.

## 1.07 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data:
  1. Include items as specified in "Project Record Documents".

2. Include inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.
  3. Provide spare parts list including unit cost. Identify components critical in maintaining the integrity of the operating system.
  4. After commissioning is complete, add a complete list of user adjustable set points and parameters for the variable speed drives with their settings in the operation and maintenance manual.
- B. Warranty Documentation:
1. After completion of the system, including software, submit a one year warranty. Provide services, materials, and equipment necessary for the successful operation of the DDC hardware and controls during the warranty period. Preventive maintenance shall be included. Software and data shall be revised and updated as necessary during warranty period to obtain system performance described in the sequences of operation.
  2. During the warranty period provide a 24 hour emergency service number where a qualified automation service engineer familiar with the installed system may be reached. This engineer shall have the capability of remotely communicating with the system for troubleshooting and program alterations.
  3. Provide inspection for opposite season to test, calibrate, and adjust controls; submit written report for each inspection.
  4. Owner-furnished devices are exempt from warranty.
- C. Record Documentation:
1. Accurately record actual location of control components, including panels, controllers, thermostats, and sensors.
  2. Revise Shop Drawings to reflect actual installation and operating sequences.
  3. Include data specified in "Submittals" in final "Record Documents" form.
  4. Include system software flow chart reflecting operating sequences.
  5. Include a complete field quality control and testing report including test procedures and results.
  6. Include a certificate stating that control systems have been tested and adjusted for proper operation.

## 1.08 QUALIFICATIONS

- A. Installer: By the local district office of the manufacturer as a subcontract or by a firm specifically engaged in the installation of building direct digital HVAC control systems at Cobleigh Hall. The entire control system shall be installed by qualified electricians and mechanics who are properly trained and qualified for the Work they perform, and directly supervised by the local representative of the component manufacturer.

## PART 2 - PRODUCTS

### 2.01 BASIC DDC SYSTEM

- A. General: The addition of the new direct digital controls to the existing DDC system shall be fully integrated and installed as a complete package of controls and instrumentation. The system shall include, but not be limited to, computer software and hardware, operator input/output devices, sensors and controls required for complete operation. Provide raceways, wiring, installation, supervision and labor, including calibration, adjustments, operator training and checkout necessary for a complete and fully operating system.
1. The programming language shall be the same as the existing system programming language.

- B. Integrate this facility with the existing Facility Operator Workstation for the Cold Room and Condenser Water Systems. Operator shall have access to the facility via the same log in screen and will utilize the same program commands, control loop software programming languages, and graphics representation as with all other similar systems on the facility wide existing DDC system. Upgrade the existing Facility Central Operator Workstation with the latest software versions. Provide additional operator workstation software as specified herein. Provide graphics for new systems at the existing Facility Central Operator Workstation.
- C. Provide construction site specific licenses as necessary for commissioning and balancing through final completion.

## 2.02 REMOTE NOTIFICATION SYSTEM

- A. DDC system shall be configured to send out messages to numeric pagers, alphanumeric pagers, phones (via text to speech technology), SMS (Simple Messaging Service, text messaging) devices, and email accounts based on a point's alarm condition.
- B. There shall be no limit to the number of points that can be configured for remote notification of alarm conditions and no limit on the number of remote devices which can receive messages from the system.
- C. On a per point basis, system shall be configurable to send messages to an individual or group and shall be configurable to send different messages to different remote devices based on alarm message priority level.
- D. Remote devices shall be configurable as to when they receive messages from the system to account for user work schedules.
- E. System shall be configurable to send messages to an escalation list so that if the first device does not respond, the message is sent on to the next device after a configurable time has elapsed.
- F. Message detail shall be configurable on a per user basis.
- G. During a "flood" of alarms, remote notification messages shall have the ability to optimize several alarms into an individual remote notification message.
- H. DDC system shall have the ability to send manual messages allowing user to type in a message to be sent immediately.
- I. Agency Listing: UL 916.

## 2.03 SURGE PROTECTION

- A. Provide surge and transient protection consisting of devices installed externally to digital controllers and operator workstations.
- B. Power line surge protection surge suppressers external to digital controller, shall be installed on incoming AC power. Surge suppresser shall be rated by UL 1449 3rd Edition and shall have clamping voltage ratings below the following levels.
  - 1. Normal Mode (Line to Neutral): 350 Volts.
  - 2. Common Mode (Line to Ground): 350 Volts.

- C. Telephone and Communication Line Surge Protection: Metal oxide varistor (MOV) protection or equivalent, rated for the application, shall be installed at the equipment.
- D. Sensor and Control Wiring Surge Protection: Controllers shall have sensor and control wiring surge protection with optical isolation, metal oxide varistors (MOV), or silicon avalanche devices. Fuses are not permitted for surge protection.

#### 2.04 WIRING

- A. Provide complete electric wiring for temperature control apparatus, including transformer primaries. Control circuit conductors which run in the same conduit as power circuit conductors shall have the same insulation level as power circuit conductors.
- B. AC Control Wiring:
  - 1. Control wiring for 24 Volt circuits shall be insulated copper 22 AWG minimum and shall be rated for 300 VAC service.
  - 2. Wiring for 120 VAC shall be 14 AWG minimum and shall be rated for 600 VAC service.
- C. DDC Analog Signal Wiring: Analog signal wiring for analog inputs and analog outputs shall be 18 AWG single or multiple twisted pair. Each pair greater than one shall be 100 percent shielded, and have 20 AWG drain wire. Exception is direct connect RTD wiring which shall be 18 AWG minimum twisted pair, 100 percent shielded, and with 20 AWG drain wire. Each wire shall have insulation rated to 300 VAC. Cables shall have an overall aluminum-polyester or tinned-copper cable-shield tape, overall 20 AWG tinned copper cable drain wire, and overall cable insulation rated to 300 VAC.
- D. Plenum Cable: Plenum cable shall be UL listed for use in ceiling return air plenums. Plenum cable external to electrical raceway is permissible in the following locations.
  - 1. Standalone DDC communication trunk serving application specific controllers within a building.
  - 2. DDC system sensor wire installed above suspended ceilings.
- E. Raceways and Conduit: Conform to requirements of Division 26.

#### 2.05 STANDALONE DDC PANEL AND OPERATOR WORKSTATION UPS

- A. Provide Uninterruptable Power Supplies (UPS) for the operator workstation and for each new standalone DDC panel installed. UPS shall be capable of powering the operator workstation and the standalone DDC panels for a minimum of 5 minutes and protecting workstation and standalone DDC panel from a restart. It is not necessary to provide UPS power to each of the field devices associated with the standalone DDC panel.

#### 2.06 CONTROL COMPONENTS

- A. Spans and Ranges:
  - 1. Temperature:
    - a. 200 Degrees F Span: Condenser water sensors.
- B. Temperature Sensors:
  - 1. Pipe temperature sensors shall be resistance temperature detectors or thermistors.
    - a. Resistance Temperature Detectors (RTDs): Provide RTD sensors with 1000 ohm, or higher, platinum elements that are compatible with the digital controllers. Sensors shall be encapsulated in epoxy, series

- 300 stainless steel, anodized aluminum, or copper. Temperature sensor accuracy shall be 0.1 percent (1 ohm) of expected ohms (1000 ohms) at 32 degrees F. Temperature sensor stability error over five years shall not exceed 0.25 degree F cumulative. Direct connection of RTDs to digital controllers, without transmitters, is preferred provided controller supports direct connection of RTDs. When RTDs are connected directly to the controller, keep lead resistance error to 0.25 degree F or less. Total error for a RTD circuit shall not exceed 0.5 degree F, which includes sensor error, lead resistance error or 4 to 20 mA or 0 to 10 VDC transmitter error, and analog/digital conversion resolution error.
- b. Thermistors: Precision thermistors may be used in temperature sensing applications below 200 degrees F. Sensor accuracy over the application range shall be 0.36 degree F or less between the range of 32 to 150 degrees F. Stability error of the thermistor over five years shall not exceed 0.25 degree F cumulative. Sensor element and leads shall be encapsulated. Bead thermistors are not allowed. Analog/digital conversion resolution error shall be kept to 0.1 degree F. Total error for a thermistor circuit shall not exceed 0.5 degree F, which includes sensor error and digital controller analog/digital conversion resolution error. Provide 18 gage twisted and shielded cable for thermistors.
2. Liquid Immersion Temperature Sensors: Insertion elements for liquids shall be stainless steel encased and matched with the temperature sensor wells installed with a minimum insertion length of 2-1/2 inches. Furnish stainless steel wells or brass wells for pipe temperature sensors suitable for the working pressure and velocity. Provide thermal transmission material for the well. Furnish wells with sealing nuts to contain the thermal transmission material and to allow for easy removal. Wells shall not restrict flow area to less than 70 percent of line-size-pipe normal flow area.
- C. Pressure Dependent Three-Way Fully Modulating Control Valves:
1. Valves 2 inches and smaller shall be ball type. Valves 2-1/2 inches and larger shall be butterfly type.
  2. Valves shall meet ANSI/FCI 70-2 Class IV leakage rating.
  3. Body pressure rating, material type, and connection type shall be suitable for use in the condenser water applications specified under Section 23 20 00.
  4. The valves shall be quiet in operation and fail-safe in either normally open or normally closed position in the event of power failure, as indicated on Drawings.
- D. Actuators: Provide control valves of sufficient size and type, matched to application.
1. Electric Actuators: Provide analog, complete with a permanently lubricated gear train. Provide spring return to normally-open or normally-closed on loss of control power as indicated in Drawings.
  2. Actuators shall have mechanical or electronic stall protection to prevent damage to the actuator throughout the rotation of the actuator.
  3. Control valve actuators shall be sized to close against a differential pressure equal to the design pump head plus 10 percent.
- E. Control Panels: Provide for controls and instruments. Panels shall be UL listed, NEMA type rated for application and location, surface or flush mounted panel as indicated with key locked door with continuous hinge. Manufacturer's standard baked enamel finish.
- F. Current Sensing Relays: Provide current sensing relays for equipment status as called out in sequences of operation or input/output summary. Provide with field adjustable current setpoint range.

- G. Current Transmitters: For equipment status; designed to convert monitored AC current to a proportional DC voltage of 0-5 Volt or 4-20 mA output. Range 1 to 10, 50, 100amps as required. Accuracy 2-percent of full scale. Repeatability plus or minus 2-percent of full scale. Response time shall be 100 milliseconds.
- H. Current Switches: Self-powered, solid-state with adjustable trip current, selected to match current and system output requirements.
- I. Control Relays: Rated for the application, with a minimum of two sets of Form C contacts, enclosed in a dustproof enclosure. Relays shall be rated for a minimum life of one million operations. Operating time shall be 20 milliseconds or less, with release time of 10 milliseconds or less. Relays shall be equipped with coil transient suppression devices to limit transients to 150 percent of rated coil voltage.
  - 1. For digital output applications, provide relay with a (Closed-Open-Auto) override switch located on the load side of the relay.
- J. Contactors: Single coil electrically operated. Contacts shall be double break silver to silver. Number of contacts and rating shall be selected for the application intended. Operating and release times shall be 100 milliseconds or less. Contactors shall be equipped with coil transient suppression devices to limit transients to 150 percent of rated coil voltage.
- K. Transformers: Provide transformers which shall conform to UL 5085. Power digital controllers on the primary communication trunk from dedicated circuit breakers. Provide a fuse cutout on the secondary side of the transformer.
- L. Nameplates: Laminated plastic 1/16 inch thick with neatly beveled edges and screwed to panel. Color shall be black with 0.375 inch white engraved block lettering.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Prior to starting Work, carefully inspect installed Work of other trades and verify that such Work is complete to the point where Work of this Section may properly commence.
- B. Notify the Engineer in writing of conditions detrimental to the proper and timely completion of the Work.

#### 3.02 DEMOLITION

- A. Where demolition Work is shown on Drawings, remove associated DDC system control devices and associated wiring and conduit back to the DDC panel and remove associated software from the entire DDC system. Maintain communication wiring intact with no loss of service to associated devices that are not included in the demolition.

#### 3.03 INSTALLATION

- A. Install in accordance with manufacturer's installation instructions.
- B. Provide miscellaneous devices, hardware, software, interconnections installation and programming required to ensure a complete operating system in accordance with the sequences of operation and point schedules.
- C. Location and Installation of Components:



1. Locate and install components for easy accessibility; in general, mount 60 inches (panels measured from top edge) above finished floor with minimum 3 feet clear access space in front of units.
    - a. Seal wall penetration behind room temperature sensor containing room temperature sensor wire with an elastic waterproof cement which will dry to a firm but pliable mass. Attach thermal break to wall and install room temperature sensor to thermal break.
  2. Suitably wire and mount instruments, switches, transmitters, etc., to protect them from vibration, moisture, and high and low temperature.
  3. Identify equipment and panels. Provide permanently mounted tags to instruments with point address designation, system reference and description.
  4. Pipe Temperature Sensors: Install temperature sensors in sensor wells. Apply thermal transmission material within the well. Attach sealing nuts to wells to contain the thermal transmission material.
  5. Control Panels:
    - a. Provide for controls and instruments at equipment and in mechanical room.
    - b. Install temperature gages and pilot lights flush on the cabinet door. Install controllers, switches, timers, transformers, and relays in the interior of the cabinet; mount on a steel or aluminum subpanel or on the back panel of the cabinet. Provide and label control parameters and test points within the panel for total evaluation of system operation. Electrical controls shall be wired to numbered screw type terminal strips.
  6. Pressure:
    - a. Pipe Sensors: Provide with isolation gage valves for each input.
- D. Control Wiring and Conduit:
1. Control wiring, conduit for control wiring, and miscellaneous accessory equipment for control wiring systems shall be provided as part of the control system. Conform to NFPA 70 and local code requirements.
  2. Wire in and through mechanical rooms, finished spaces, on roofs, in walls, below grade, and inside equipment (except within control wiring compartments or control panels) shall be installed in conduit and properly supported. Label wire groups to match corresponding wiring diagrams.
  3. Plenum Cable: Plenum cable type, installation methods, and use shall be subject to City and State Codes and Regulations. Within ceiling space, attach directly to wall or slab on 4 foot centers, or support from ceiling suspension wires on 4 foot centers. Do not attach cables to pipes and ducts. Do not lay cables on ceilings.
  4. Instrumentation and communication cable shall not be run together in the same conduit or raceway as power wiring.
  5. Grounding: Ground controllers and cabinets to a good earth ground. Grounding of the green AC ground wire, at the breaker panel, alone is not adequate. Run metal conduit from controller panels to adequate building grounds. Ground sensor drain wire shields at controller end.
  6. Each wiring termination (low voltage power and control signaling) shall be provided with a 6 inch extension (service) loop at the point of connection. Terminations shall be inside NEMA rated enclosures.
  7. Provide wire for each remote sensor which connects the remote sensor to the same DDC panel to which the output device it controls is connected (for example connect the heating water system differential pressure sensor to the same DDC panel as the heating water pump VSD speed output). Provide additional hardware required to ensure the correct signal is received at the DDC panel based on the length of wire required.
  8. Provide interface required for the following.
    - a. Adiabatic Fluid Cooler

- E. Remote Notification System: Coordinate with Owner to determine designated personnel to be notified and program this information into DDC system.

### 3.04 SYSTEM STARTUP

- A. Variable Speed Drives:
  - 1. Provide start-up and commissioning of the variable speed drives (VSD) (Existing to be reprogrammed) and their circuits by a factory certified service technician who is experienced in start-up and repair services. The startup personnel shall be the same personnel that will provide the factory service and warranty repairs at the building. Sales personnel and other agents who are not factory certified technicians for VSD field repair are not acceptable. Start-up settings and measurements, including drive settings, shall be recorded and a startup form completed and submitted to the Engineer. Provide a startup report for each drive. Start-up services shall include checking for verification of proper operation and installation of the VSD, its interface wiring to the DDC system and the following.
    - a. Verification of contractor wire terminations to the VSD and its optional circuitry.
    - b. Installation verification for proper operation and reliability of the VSD, the motor being driven, and the building automation system.
    - c. Measurement for verification of proper operation on each of the following.
      - 1) Motor voltage and frequency. Verification of proper motor operation.
      - 2) Control input for proper building automation system interface and control calibration.
    - d. Calibration check for the following set points.
      - 1) Minimum speed.
      - 2) Maximum speed
      - 3) Acceleration rate.
      - 4) Deceleration rate.

### 3.05 FIELD TESTS AND INSPECTIONS

- A. Provide point-to-point test, sequence of operations test, and field quality control and testing plans. Test plans shall be used in final acceptance to verify operation of all points and control functions specified.
- B. Execution of Sequence of Operation: Provide documentation which includes the following.
  - 1. The HVAC system operates properly through the complete sequence of operation, for example seasonal, optimal start/warm-up, and occupied/unoccupied modes of operation.
  - 2. Proper control system response for abnormal conditions for which there is a specified response by simulating these conditions.
  - 3. System hardware interlocks and safeties work.
  - 4. The control system performs the correct sequence of control after a loss of power.
  - 5. Graphic trends demonstrating the sequence of operation is executed in correct order.
- C. Demonstration: Demonstrate compliance of the HVAC control system with the Contract Documents. Calibrate instrumentation and controls and verify the specified accuracy using calibrated test equipment. Adjust controls and equipment to maintain conditions indicated, to perform functions indicated, and to operate in the sequence specified.

Furnish personnel, equipment, instrumentation, and supplies necessary to perform calibration and site testing. Ensure that tests are performed by competent employees of the DDC system installer or the DDC system manufacturer regularly employed in the testing and calibration of DDC systems. Calibrate field equipment and verify equipment and system operation before placing the system on-line. Demonstration shall include the following.

1. System Inspection: Observe the HVAC system in its shutdown condition. Check dampers and valves for proper normal positions. Document each position for the test report.
2. Calibration Accuracy and Operation of Inputs Test: Check for proper calibration and operation of each input instrument. For each sensor (temperature), record the reading at the sensor, and using a traceable test equipment, and record the reading at the digital controller. Document each reading for the test report.
3. Operation of Outputs Test: Check the operation of each output to verify correct operation. Command analog outputs to minimum range, such as 4 mA, and maximum range, such as 20 mA, measure and record commanded and actual output values. Document each command and result for the test report.
4. Actuator Range Adjustment Test: With the digital controller, apply a control signal to each actuator and verify that the actuator operates properly from its normal position to full range of stroke position. Record actual spring ranges and normal positions for modulating control valves and dampers. Include documentation in the test report.
5. Digital Controller Startup and Memory Test: Demonstrate that programming is not lost after a power failure, and digital controllers automatically resume proper control after a power failure.
6. Surge Protection: Show that surge protection, meeting the requirements of this Specification, has been installed on incoming power to the digital controllers and on communication lines.
7. Application Software Operation Test: Test compliance of the application for the following.
  - a. Ability to communicate with the digital controllers, uploading and downloading of programs.
  - b. Text Editing Program: Demonstrate the ability to edit the control program off line.
  - c. Reporting of Alarm Conditions: Cause alarm conditions for each alarm and ensure that workstation receives alarms.
  - d. Reporting Trend and Status Reports: Demonstrate ability of software to receive and save trend and status reports.
  - e. Control Loop Stability and Accuracy: Furnish graphic trends of control loops to demonstrate the control loop is stable and that set point is maintained. Control loop response shall respond to set point changes and stabilize within 1 minute.
  - f. Opposite Season Test: Testing shall be repeated for opposite season.
8. Provide summary and global overrides to support performance testing and troubleshooting.
9. Trending Set-Up: Set-up trending for points sufficient to demonstrate functionality of control sequence of operation, per the direction of the Owner, in order to facilitate acceptance testing and long-term evaluation of the facility's energy use, equipment operation, control stability, and setpoint maintenance. Trends shall be provided both in raw data format and graphical format; and trends shall be grouped to meet the needs of the Owner.
10. Control Trend Log Submittal: Trend logging shall be provided in MS Excel raw data form and in a graphical plot format that demonstrates the specified sequences of operation for each piece of equipment as directed for Functional Performance Test procedures.

11. The Owner and Engineer will designate specific points to be trended and trend type for each point (e.g. change of value, period of time, etc.).
  12. Reference Section 01 79 00 for additional requirements.
- D. Prepare a complete report of test procedures and results. Document tests with detailed results. Provide statement that corrective action has been taken. Submit test report to Engineer and include test report in operation and maintenance manuals.

### 3.06 TRAINING

- A. Upon completion of the Work, furnish the services of a competent technician regularly employed by the DDC manufacturer to provide training as described in Section 01 79 00.

END OF SECTION

SECTION 23 60 00

CENTRAL COOLING EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The Work of this Section includes adiabatic evaporative coolers.

1.02 RELATED REQUIREMENTS

- A. Section 23 09 23 – Direct-Digital Control System for Plumbing and HVAC: DDC integration with coolers.

1.03 SUBMITTALS

- A. Product Data:
1. Adiabatic Evaporative Coolers.
- B. Performance Data:
1. Cooler:
    - a. Submit fan performance curve for the cooler. Curve shall show pressure versus air flow, efficiency, and brake horsepower. Specified point of rating shall be prominently shown and labeled on curve.
    - b. Submit a performance graph (water temperature on the vertical axis and air wet bulb temperature on the horizontal axis) for each of the following 4 conditions. Range of air wet bulb temperature shall be 40 degrees F to 75 degrees F.
      - 1) 100 percent air flow and maximum nozzle water flow in design range of 10 degrees F plus or minus 2 degrees F.
      - 2) 50 percent air flow and maximum nozzle water flow in design range of 10 degrees F plus or minus 2 degrees F.
      - 3) 100 percent air flow and minimum nozzle water flow in design range of 10 degrees F plus or minus 2 degrees F.
      - 4) 50 percent air flow and minimum nozzle water flow in design range of 10 degrees F plus or minus 2 degrees F.
- C. Shop Drawings:
1. Submit Shop Drawings of the cooler. Include the following.
    - a. Dimensions and weights.
    - b. Location of support points and load distribution of the cooling tower.
    - c. Size and location of piping and electrical connections.
    - d. Manufacturer's recommended installation and maintenance clearances.
    - e. Electrical wiring diagrams and component parts list.

PART 2 - PRODUCTS

2.01 COOLERS

- A. Manufacturer and Type: Guntner "ACS Series". The cooler shall consist of an Adiabatic Cooling System, a heat exchanger, painted galvanized steel casing, and one or more low noise axial fans with maintenance-free motors. The Adiabatic Cooling System shall consist of evaporative cooling pads, water collection system, ambient temperature probe, and a water distribution and collection system with solenoid valve, strainer, balancing

- valves, drain valve, piping, and collection system. The heat exchanger shall consist of coils fitted with fins (copper pipe, aluminum fins), distribution and header pipes (copper) and pipe connections to the pipeline system.
- B. Quality: The cooler shall bear the ETL Mark to indicate compliance to safety standards. The cooler manufacturer shall have a Management System certified by an accredited registrar as complying with the requirements of ISO9001 to ensure consistent quality of products and services. Manufacturers that are not ISO9001 Certified shall not be acceptable.
- C. Casing: The cooler casing shall be robust, self-supporting construction of galvanized steel, varnished with RAL 7035 (light grey). Within the casing, each fan chamber shall be separated by an internal baffle to prevent windmilling during off-cycle.
- D. Corrosion Resistant Construction: Steel panels and structural members shall be constructed of heavy gage G-235 hot-dip galvanized steel, with sheared edges given a protective coating of zinc-rich compound.
- E. Coil Assembly: The cooler coil shall have a floating coil design that prevents any contact of the glycol-carrying tubes with the supporting frame allowing for thermal expansion and contraction of the tubes without risk of tube damage at the tube sheet. The coil shall use expanded support tubes to minimize flexing during installation. Coil shall be constructed of 0.47 inch diameter copper tubes. Fins shall be constructed of aluminum, full drawn collar with tubes expanded into collar. Coil tubes shall be connected to copper headers. Coils shall be pressure tested to 450 psig (31 bar) with dry air underwater and shipped with a 25 psig (1.7 bar) dry air holding charge.
- F. Fan System: Fan sets shall consist of a system utilizing external rotor motor with die cast aluminum sickle bladed impeller and fan guard. Impeller and rotor shall form one complete unit to ensure proper balancing. Fan sets shall be supplied with full bell mouth fan plate, optimized for highest efficiency. Wire fan guards shall be of welded construction, coated in a weatherproof durable synthetic finish for maximum corrosion protection and in compliance with safety standard EN294. Fans shall be subject to balance quality Q6.3 according to VDI 2060.
- G. Fan Motors: Fan motors shall be sealed with a labyrinth seal impeding the ingress of splash water and include drain holes for condensation water drainage. Thermal contacts shall be integrated into the motor windings. Motors shall have protection class IP 54 and windings with thermal class F according to DIN EN 60 034-1.
- H. Adiabatic Cooling System: The indirect adiabatic cooling system will pre-cool the entering air stream prior to the finned coil heat transfer surface. The adiabatic heat transfer surface shall incorporate wetted pads constructed of specially designed cellulose paper that is chemically treated to resist deterioration and bacterial growth. The water distribution system shall include solenoid valve, balancing valves, strainer, piping, headers, and water distribution orifices. The water collection system shall be constructed of welded type 304 stainless steel collection basins with a single drain connection. Water temperature and ambient temperature sensors are included. The adiabatic pre-cooling system shall only be activated when design ambient temperature rises above a target ambient temperature set-point, thus limiting water usage.
- I. Motor Management System: Dry cooler shall be supplied with EC (Electronically Commutated) Fan Motors and Motor Management System to create an intelligent fan motor system that optimizes operation of the cooler and simplifies maintenance. Furnish with BACnet interface card. The controller adjusts fan motor speed based on temperature and regulating processes to provide reliability and information for the

system. The Motor Management System reduces sound emission due to no control-induced noise, especially in part-load operation.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. General: Conform to requirements of Section 23 00 00 and manufacturer's installation instructions.
- B. Cooler:
  - 1. Secure cooler tower to the structural steel members with vibration isolation pads per notes on plans.

#### 3.02 STARTUP AND TESTING

- A. Coolers: The cooler manufacturer's certified engineer or technician shall provide field startup service and field testing.
  - 1. General: Field startup services and field testing at the site shall be provided by the manufacturer's certified engineer or technician and in the presence of the Owner and Engineer. Provide labor, equipment, test apparatus, and incidentals required. Equipment defects disclosure by the tests shall be rectified at no expense to the Owner. Tests are complete when the Owner and Engineer determines that cooling tower is complete and fully operational. Give 7 days notice to the Owner and Engineer prior to witnessing of test or demonstrations.
  - 2. Field Startup Services: Startup and initially operate the cooler. During startup tests, manufacturers certified engineer or technician shall ensure the proper functioning, adjustment, and testing of the individual components and the cooling tower.
    - a. Startup services shall include checking for verification of proper operation, the fan motors being driven, and its interface wiring to the DDC system.
    - b. Fan Speed adjustments to remove excessive vibration at 1 HZ intervals.
    - c. Coordination of BAS interface points with the Temperature Controls Contractor.
  - 3. Field Testing:
    - a. Schedule: As soon as practical after initial startup, schedule performance testing in concurrence with the Certified Commissioning Professional.
    - b. Demonstrate proper operation through complete cycles and perform tests to show that the cooler is fully operational.
    - c. Test Data: Record test data during the performance tests and submit to the Engineer for review. Record manufacturer's names, addresses, and telephone numbers. Record cooler model number and serial number. Record condition of fans and controls. Record fan operating conditions; include electrical readings. Record other pertinent conditions that may affect operation of cooling tower and controls.
    - d. Retesting: If during any test the equipment malfunctions or if test data are inaccurate, the test shall be aborted, the problems corrected, and the test re-run.

END OF SECTION

## TABLE OF CONTENTS

SECTION            TITLE

### ELECTRICAL REQUIREMENTS

#### Division 26 Electrical

260500	Electrical General Requirements
260513	Medium, Low & Control Voltage Cables
260526	Grounding & Bonding for Electrical
260533	Electrical Materials & Methods
260800	Electrical Acceptance Tests
262900	Motor Controls



## **SECTION 260500 – ELECTRICAL GENERAL REQUIREMENTS**

### **PART 1 GENERAL**

#### **1.1 INTENT OF PLANS AND SPECIFICATIONS**

- A. The plans and specifications contemplate the complete installation of the system described so that at the conclusion of the construction, the systems will be turned over to the owner complete and ready for safe, efficient operation. The plans and specifications cannot deal individually with the many minute items which may be required by the nature of the systems. The contractor shall be obliged to furnish and install all such items normally included on systems of this type, which while not mentioned directly herein, are obviously essential to the installation and operation of the system and which are normally furnished on quality installations of this type.
- B. The drawings are partly diagrammatic and do not necessarily show exact location of conduit unless specifically dimensioned. Riser and other diagrams are schematic and do not necessarily show the physical arrangement of the equipment. They shall not be used for obtaining quantities or lineal runs of conduit.
- C. In receiving bids, it will be assumed that each bidder has made a thorough inspection of the conditions and is familiar with all conditions affecting the extent or cost of this work. Claims for extra payments as a result of failure to examine the conditions prior to submitting the bid will not be allowed.

#### **1.2 ELECTRONIC COPIES OF DOCUMENTS**

- A. Electronic drawing files are available for construction coordination upon written request to the architect or engineer for a cost of \$100 per drawing. A written release waver will be required to be signed by the entity requesting the drawing(s). Upon receipt of signed waver and payment of drawing fee, electronic files will be delivered. Regardless of files delivered, it is the responsibility of the recipient to field verify all conditions prior to the fabrication or installation of any work.

#### **1.3 CODES, ORDINANCES, PERMITS, AND FEES**

- A. Comply with all state and local codes and ordinances applying to the work specified herein. Attention is directed in particular to the NATIONAL ELECTRIC CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), NATIONAL ELECTRICAL MANUFACTURERS INSTITUTE (NEMA), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE), INTERNATIONAL BUILDING CODE (IBC), UNIFORM FEDERAL ACCESSIBILITY STANDARDS (UFAS), INTERNATIONAL ENERGY CONSERVATION CODE (IECC), MANUFACTURERS INSTRUCTIONS AND/OR ANY AUTHORITY HAVING JURISDICTION, and local regulations concerning the specified electrical, lighting and special systems equipment.
- B. Make application for, obtain and pay for all required permits and certificates of inspection for the work.
- C. In the event of conflict between this specification and a governing code or ordinance, the higher standard shall govern. Bidders shall familiarize themselves with local regulations which affect their work in any way. Extra payment will not be allowed for changes required by local regulations.

#### 1.4 RESPONSIBILITY

- A. Be responsible for the installation of a satisfactory and complete system in accordance with the intent of the drawing and specifications. Provide, at no extra cost, all incidental items required for completion of the work even though they are not specifically mentioned or indicated on the drawings or in the specifications.
- B. Location of electrical system components shall be checked for conflicts with openings, structural members and components of other systems having fixed locations. In the event of any conflicts, the Engineer shall be consulted and his decision shall govern. Necessary changes shall be made at no additional expense to the Engineer or Owner.
- C. Determine, and be responsible for, the proper location and character of inserts for hangers, chases, sleeves and other openings in the construction required for the work, and obtain this information well in advance of the construction progress so work will not be delayed. Roughing-in fixtures, etc., must be laid out accurately. Connections to equipment of the same class shall be equal heights, plumb, and at right angles to the wall, unless otherwise directed.
- D. Final location of inserts, hangers, etc., required for each installation, must be coordinated with facilities required for other installations to prevent interference.
- E. Take extreme caution not to install work that connects to equipment until such time as complete Shop Drawings of such equipment have been approved by the Engineer. Any work installed by the Contractor, prior to approval of Shop Drawings, will be at the Contractor's risk.
- F. At all times during the performance of this Contract, properly protect work from damage and protect the Owner's property from injury or loss. Make good any damage, injury or loss, except such as may be directly due to errors in the Bidding Documents or caused by Agents or Employees of the Owner. Adequately protect adjacent property as provided by law and the Bidding Documents. Provide and maintain passageways, guard fences, lights and other facilities for protection required by Public Authority or Local conditions.

#### 1.5 INSPECTION

- A. Regular inspections shall be requested of duly authorized inspectors as required by codes and ordinances.

#### 1.6 SUBSTITUTING

- A. Provide all equipment, fixtures, materials and products exactly as listed in the project plans, schedules and specifications. The Manufacturer listed in the project equipment schedules, drawings and specifications is the basis of design for the project. "Approved Equal" manufacturers listed in the drawings and specifications are allowed to bid only if the manufacturer can provide exactly equal equipment, fixtures, materials and products as listed in the basis of design schedules, drawings and specifications, regardless of any prior approval listing. Any variation in the performance, appearance, color, shape, size, weight, electrical characteristics, etc. is subject to rejection during shop drawing review. The product supplier and installing contractor are responsible for any and all

changes to the project and associated costs for any equipment, fixtures, materials and products provided that do not meet the project design requirements.

- B. Proposals to contractor for substitution of material and equipment listed on the drawings and/or these specifications shall be submitted after the engineer's approval has been obtained. For such proposals, materials and equipment will have to conform in type, function, quality of material and assembly and meet the requirements indicated in drawings and specifications. REQUESTS FOR APPROVAL SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER AT LEAST 10 DAYS PRIOR TO THE BID DATE. Each request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information needed for an evaluation. A statement setting forth any changes in any other equipment or other work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. If these proposed substitutions are considered as acceptable equals for quotations and use, approval will be issued in an addendum.

## **1.7 SHOP DRAWINGS**

- A. The contractor shall submit to the engineer for approval, prior to the placing of orders for any equipment, a complete schedule of electrical equipment and light fixtures to be installed. PDF versions are required for review. Include in the schedule catalogs, cuts, diagrams, shop drawings, photometric data or any other descriptive material necessary to fully describe the equipment proposed and its operating characteristics. The schedules shall list the operating conditions of the equipment at the conditions listed on the schedules. Provide shop drawings for the following equipment:
  - 1. Emergency Lighting Inverters.
  - 2. Raceway and Fittings.
  - 3. Cables, Wires and Terminations.
  - 4. Grounding Connections.
- B. All shop drawings shall be submitted by the contractor and shall have been signed, "approved" and initialed by the contractor prior to submittal to the engineer. The engineer will check the shop drawings to aid in interpreting the plans and specifications, and in so doing will assume that the shop drawings conform to all specified requirements set forth in this specification. The approval of the shop drawings by the engineer does not relieve the contractor of the responsibility of complying with all elements of the specification.
- C. The determination of quantities of material and equipment required shall be made by the contractor from the drawings. Schedules on the drawings and in the specification are completed as an aid to the contractor, but where discrepancies arise, it shall not release the contractor from providing the proper number to complete this work.

## **1.8 ASBESTOS CONTAINING MATERIALS**

- A. Coordinate all work with the asbestos abatement contractor for this project. Prior to the start of work the Contractor shall review all asbestos reports or sample analysis, that the Owner has had completed. The Contractor shall not cut into or in any other way disturb existing materials which contain asbestos. Asbestos abatement is not within the scope of Division 26 work. If the Contractor must disturb a material that has not

been tested for asbestos, request in writing shall be made to the Owner that the material be tested for asbestos prior to the start of work.

- B. The Contractor shall provide materials and equipment which do not contain asbestos. At the completion of the project, the Contractor shall certify in writing that the materials and equipment installed do not contain asbestos.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- A. Fire barrier caulking system shall be 3M CP25 caulk. Fire barrier caulk shall be UL classified and Factory Mutual System approved.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION OF THE WORK**

- A. The Contractor shall examine all the drawings before proceeding with the layout and installation of his work. General, mechanical, and plumbing contract drawings will be made available to this Contractor. SHOULD DISCREPANCIES AFFECTING THE WORK BE FOUND, THE CONTRACTOR SHALL IMMEDIATELY REPORT SAME TO THE ENGINEER FOR INSTRUCTIONS. Subsequent changes made necessary by the neglect of any Contractor to discover and report such discrepancies shall be made by and at the expense of the Contractor, under the direction of the Engineer.
- B. Furnish, provide, and/or install shall be considered as requiring the Contractor to both furnish the equipment and install it unless specific reference is made to the furnishing or installing of the equipment by others.
- C. The Contractor shall confer and cooperate with other Contractors on the job in the installation of his work so all work will be installed in proper relationship to the surrounding location and shape of any part to avoid conflicts. The Contractor shall be responsible for the correct size and location of any changes, slots, and openings required by him and shall be required to do, at his expense, any cutting or patching made necessary by his failure to make proper arrangements in this respect.
- D. The Contractor shall follow the equipment manufacturer's instructions and recommendations in the installation and connection of all equipment and materials furnished under this contract. In the event of conflict or discrepancy between manufacturer's instructions and the contract documents, the Contractor shall notify the Engineer before proceeding. No equipment installation shall be made in a manner that voids the manufacturer's warranty of the equipment.

### **3.2 SUPPLEMENTARY FRAMING AND HOUSEKEEPING PADS**

- A. Provide the design, fabrication, and erection of supplementary structural framing required for the attachment of hangers or other devices supporting electrical equipment.
- B. Provide framing members of standard rolled steel shapes, A-36 steel, designed for their actual loads, with allowable stresses specified by AISC, without excessive deflection and with consideration for rigidity under vibration, in accordance with standard structural practices.

- C. When suspending transformers or similar vibrating equipment, provide vibration isolators to isolate vibration from structural members.
- D. Provide housekeeping pads where shown on plans. Size as noted or shown. Electrical contractor shall hire concrete contractor to install pads.

### **3.3 CLEANING**

- A. Labels, stickers, etc., shall be removed and the entire installation left in a clean, usable condition.

### **3.4 PAINTING**

- A. Finishes of all electrical equipment shall be protected during storage, installation and until final acceptance. Any damage or imperfections shall be "touched up" or if extensive, the entire unit shall be repainted as directed by the Engineer.

### **3.5 FIRE BARRIER PENETRATIONS**

- A. All cracks, voids, or holes for the passing of mechanical and electrical items through floors and fire rated walls, or ceilings with fire rating of 1 hour or more shall be sealed with a fire barrier caulk.
- B. Fire barrier caulking system shall be 3M CP 25 caulk.
- C. Fire barrier caulking system shall be installed in accordance with the manufacturer's recommendations to maintain a fire rating of 3 hours minimum.

### **3.6 PLENUM PENETRATIONS**

- A. Seal all cracks, voids, or holes for the passing of mechanical and electrical items through plenum construction with material to match surrounding construction or with fire barrier caulk.

### **3.7 SLEEVES**

- A. The Electrical Contractor shall set and maintain all sleeves. Any conduit passing through building construction including walls, floors, roofs or masonry partitions shall be encompassed with sleeves in accordance with the following.
- B. All conduit sleeves through slabs, floors, masonry walls and partitions shall be 1/2 inch greater in inside diameter than the external diameter of pipe passing through. All sleeves shall be fabricated from new material cut square and reamed.
- C. Sleeves shall be provided in all masonry partition walls and floors. Sleeves shall be Schedule 40 steel pipe. Wall sleeves shall be flush with the wall surface. The top of floor sleeves shall extend 1" above the floor, the bottom of the sleeve shall be flush with the floor.
- D. The space between the pipe and the sleeves, through fire rated walls and floors shall be protected as designated below.
- E. All sleeves through floors shall be sealed watertight.

### **3.8 OPENINGS**

- A. All openings required for the passage of multiple conduits and electrical equipment in the construction shall be provided by the Electrical Contractor. The Electrical Contractor shall be responsible for determining the correct location for all openings.
- B. The inside dimensions of all openings shall be 1/2 inch greater than the size of the conduit or equipment passing through the opening.
- C. All openings through fire rated walls and floors shall be protected as described above.

### **3.9 EXISTING SERVICES**

- A. The Contractor shall verify the exact location of all existing building services extended and/or relocated for this project. The Contractor shall also verify the exact location and take proper precautions to protect all services which may be encountered during construction.
- B. All active services which are encountered shall be protected, braced and supported where required for proper execution of the work and without interruption of service if possible.
- C. All inactive services which are encountered shall be protected, or removed as directed by the Owner, Utility Company, or Municipal Agency having jurisdiction.
- D. When active services must be temporarily interrupted, arrangements shall be made to work continuously including overtime if required, to assure that services will be interrupted only as long as actually required to complete necessary work.

### **3.10 DEMOLITION & REMODELING WORK**

- A. Wherever existing electrical wire, conduit, controls, circuits, etc., are cut into, removed, interrupted, as a result of the remodeling, all such items that serve areas or equipment that remain shall be re-routed, extended, relocated, etc., as necessary to maintain operation of equipment and services.
- B. Downtime shall be held to a minimum. Outages shall be scheduled at a time acceptable to and approved by the owner. Consult with the owner in sufficient time for him to make necessary preparations for the outage.

### **3.11 ACCESS TO EQUIPMENT**

- A. Access shall be provided to all motors, junction boxes, relays, controls, specialties, etc., for maintenance purposes. All access doors, access panels, removable sections, etc., required for access shall be provided. The General Contractor will provide access panels and doors required in the building construction where shown on the plans. The location of the access openings relative to the electrical equipment shall be coordinated to assure proper access to the equipment.

### **3.12 PROTECTIVE DEVICES**

- A. All sheaves, belts, drives, couplings, and moving parts shall be protected by approved permanent guards, shields, or railings, which shall be in place whenever the equipment is in operation and shall be in accordance with applicable safety standards.

### **3.13 TESTS**

- A. Test all wiring and connections for shorts between conductors, shorts to ground, and for continuity prior to installation of fixtures and equipment.
- B. Perform insulation resistance test on all feeder conductors installed under this contract, including neutrals, using a megohmmeter. Minimum value shall be 100 megohm at 60 degrees F.
- C. Correct and retest any defects and submit data to engineer.

### **3.14 ALL EQUIPMENT FURNISHED UNDER DIVISIONs 26000:**

- A. At a time set by the contractor and agreed to by the owner, arrange to place equipment in operation and have available at that time, if required, representatives of the manufacturer of equipment to assist in starting equipment, to make necessary adjustments to equipment, and to prove satisfactory operation prior to turning facility over to the owner.
- B. Any irregularities, faulty equipment, etc., shall be repaired or replaced as required prior to acceptance.

### **3.15 OPERATION AND MAINTENANCE MANUALS**

- A. Refer to Division 1 requirements for O&M Manual requirements.

### **3.16 PROJECT CLOSE OUT**

- A. Refer to Division 1 for additional requirements.
- B. The electrical contractor shall arrange for an inspection of all items installed in the ceiling before the ceiling or ceiling tile is installed. The engineer shall be informed at least one week before the planned installation of the ceiling to arrange the inspection. If the ceiling tile is installed before the inspection, the electrical contractor shall remove all the ceiling tiles prior to the inspection.
- C. Record Drawings: Give special attention to the complete and accurate recording of concealed and non-accessible work, and junction box location(s) of all conduit systems, and work of change orders where not shown on contract documents.
- D. Operating Instructions: Conduct at least a 2 hour walk-through instruction seminar for the Owner's personal to be involved in the operation and maintenance of the electrical equipment and systems. If more time is needed the contractor shall continue instruction until the owner's personal are familiar with the operation of the system. Explain the identification system, operational diagrams, emergency and alarm provisions, seasonal provisions, security, safety, efficiency and similar features of the system.
- E. Turn-Over of Operation: At the time of substantial completion, turn over the prime responsibility for the operation of the system to the owner's personal. However until the time of final acceptance, provide at least one full-time operating engineer, who is completely familiar with the work, to consult with and continue training the owner's personal.

- F. Final Completion: The following special requirements shall be provided in addition to those specified elsewhere:
1. The contractor shall not call for final completion check until the electrical systems and equipment have been installed, adjusted, programmed, and are in full and complete satisfactory operation.
  2. Exceptions may be permitted upon written request from the contractor listing any minor items that are uncompleted and beyond his reasonable control. Provide a full guarantee that they be completed at a named later date and the guarantee shall be extended as required to provide a full warranty.
- G. Final Payment will not be made until the contractor has satisfactorily completed all final inspection items.
- H. Guarantee: All equipment and work shall be fully guaranteed, parts and labor for one year from the date of substantial completion, unless noted otherwise. The contractor has the full responsibility to guarantee all equipment and work and shall assume full responsibility to repair any equipment at his cost which the manufacturer refuses to guarantee. The Owner has the right to order repairs to any equipment or work provided hereon and to charge the contractor for the same if repairs are not made during a reasonable period of time not to exceed 24 hours during an emergency or 72 hours on a non-critical item.

**END OF SECTION 260500**



## **SECTION 260513 - MEDIUM, LOW AND CONTROL VOLTAGE CABLES**

### **PART 1 GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract and other applicable Specification Sections including the Related Sections listed below, apply to this Section.
- B. Related Sections:
  - 1. Section 260526 - Grounding and Bonding for Electrical
  - 2. Section 260533 - Electrical Materials and Methods
  - 3. Section 260800 – Electrical Acceptance Tests

### **PART 2 PRODUCTS**

#### **2.1 CABLE AND WIRE (600 VOLTS AND BELOW)**

- A. Secondary distribution and power cable shall be single conductor stranded copper, No. 12 AWG minimum; with NEC Type THHN insulation rated 90 degrees C, 600 volts. Alan Wire, American Insulated Wire, General, Cerro Wire, Encore, Republic Wire, Rockbestos, Service Wire, or United Copper Industries.

### **PART 3 EXECUTION**

#### **3.1 INSTALLATION REQUIREMENTS**

- A. Install all wires in raceways.
- B. Use cable lubricant when pulling secondary feeder cables. Avoid exceeding manufacturer's recommendations on pulling tensions; sidewall pressures and cable bend radii.
- C. Segregate wiring of different voltage levels.
- D. Splice power cables with solderless compression butt splices or ring lugs. Terminate power cables including motor leads with solderless compression ring lugs. Compression connectors and lugs shall be crimped with tools specifically designed for the terminations being crimped.
- E. If no color coding system exists for each indicated system function and voltage, color code circuits as follows:
  - 1. Three Phase Power 480/277 Volts:
    - Phase X (A): Brown
    - Phase Y (B): Orange
    - Phase Z (C): Yellow
    - Neutral: Grey
    - Ground: Green
  - 2. Three Phase Power 208/120 Volts:
    - Phase X (A): Black

Phase Y (B): Red  
Phase Z (C): Blue  
Neutral: White  
Ground: Green

- F. Provide identification tags on all conductors terminated in panels.

### **3.2 COMMISSIONING**

- A. Perform commissioning activities in accordance with Related Sections.

**END OF SECTION 260513**

## **SECTION 260526 – GROUNDING AND BONDING FOR ELECTRICAL**

### **PART 1 GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract and other applicable Specification Sections including the Related Sections listed below, apply to this Section.
- B. Related Sections:
  - 1. Section 260513 - Medium, Low & Control Voltage Cables
  - 2. Section 260533 - Electrical Materials and Methods
  - 3. Section 260800 - Electrical Acceptance Tests

#### **1.2 SUMMARY**

- A. Provide grounding for all systems and equipment included in the construction documents.

#### **1.3 CONNECTION REQUIREMENTS**

- A. Exposed ground connections (except connections to structural steel) may be made with copper or bronze compression ground fittings or bolted compression ring lugs.
- B. Provide exothermic weld type, or Burndy Hyground ground connections for splices and taps of grounding conductors No. 8 AWG and larger. Exposed splices and taps shall be taped.

### **PART 2 PRODUCTS**

#### **2.1 GROUNDING CONDUCTORS**

- A. Grounding conductors for general use shall be stranded, copper conductor, sized in accordance with the NEC unless shown otherwise on the drawings, and insulated with green NEC Type THHN insulation rated 90 degrees C, 600 volts.

#### **2.2 GROUND CONNECTIONS**

- A. Ground connections shall be Burndy Hyground, Cadweld, Thermo-weld or Thomas & Betts Blackburn only.

### **PART 3 EXECUTION**

#### **3.1 INSTALLATION REQUIREMENTS**

- A. Provide copper grounding conductors from transformers and panelboards to the building grounding system. Equipment rated above 480 volts or 600 amps shall be grounded by a minimum of two independent grounding conductors.

- B. Bond central battery/inverter system and separately derived electrical system neutrals to the building grounding system.
- C. Provide green insulated equipment grounding conductors in all feeder circuits for connection of load devices to the power source ground. Raceways shall not be used as equipment grounding conductors.
  - 1. Equipment grounding conductors shall not be daisy-chained.
  - 2. Bond equipment-grounding conductors in boxes and enclosures where the grounding conductors are terminated or spliced.
- D. Bond conduits, boxes, and enclosures together, and to the building grounding system. Provide bonding bushings and bonding jumpers to bond conduits where they enter a box or enclosure.
- E. Protect separately routed grounding conductors subject to damage or physical abuse by Schedule 40 PVC nonmetallic conduits. Grounding conductors shall not be routed in metallic conduits except when routed with phase conductors.

### **3.2 COMMISSIONING**

- A. Perform commissioning activities in accordance with Related Sections.

**END OF SECTION 260526**

## **SECTION 260533 - ELECTRICAL MATERIALS AND METHODS**

### **PART 1 GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract and other applicable Specification Sections including the Related Sections listed below, apply to this Section.
- B. Related Sections:
  - 1. Section 260513 - Medium, Low & Control Voltage Cables
  - 2. Section 260526 - Grounding and Bonding for Electrical

#### **1.2 SUMMARY**

- A. Provide conduits, boxes, fittings and supports to form a complete, coordinated, and continuously grounded raceway system.

#### **1.3 CONDUIT REQUIREMENTS**

- A. Conduits indoors in general areas shall be electrical metallic tubing (EMT) with steel set screw fittings.
- B. Final connections to transformers and equipment subject to vibration or removal for maintenance shall be 1/2" minimum liquid tight flexible metallic conduit with steel liquid tight fittings.

#### **1.4 BOX REQUIREMENTS**

- A. Provide sheet steel outlet boxes, extensions, and plaster rings for EMT and flexible metal conduit.
- B. Provide cast or malleable iron outlet boxes and covers for liquid tight flexible metal conduits.
- C. Boxes shall be sized for all conductors and devices to be contained within.

#### **1.5 SUPPORT REQUIREMENTS**

- A. Surface mounted equipment shall be secured to steel channels. The channels shall be attached with toggle bolts to hollow tile, block or similar surfaces, and attached with screws or bolts and expansion shields to solid masonry or concrete.

### **PART 2 PRODUCTS**

#### **2.1 CONDUITS**

- A. Electrical metallic tubing shall be thin wall steel tubing, electro-galvanized or hot dipped galvanized inside and outside. Fittings and bushings shall be galvanized steel set screw type with two screws per connection for sizes over 2".

- B. Flexible metallic conduit shall be galvanized steel or aluminum. Fittings shall be of steel with cadmium or galvanized finish. Fittings shall be machine screw clamp type, single or two-piece. Self-locking, twist-in type fittings are not acceptable.
- C. Liquid tight flexible metallic conduit shall consist of a flexible, galvanized steel core, a continuous copper ground strip and a polyvinyl chloride jacket. Fittings shall be steel liquid tight grounding type from the same manufacturer as the conduit.

## **2.2 BOXES**

- A. Pull and junction boxes shall be
  1. Fabricated from galvanized or painted code gauge cold rolled carbon steel sheets.
  2. Welded construction with flat removable covers fastened to the box with machine screws.
  3. Seams and joints shall be closed and reinforced with flanges formed of the same material from which the box is constructed or by continuous welding which will provide equivalent strength to flange construction.
  4. Preferably not provided with 'knockouts'.
- B. Box covers shall be fastened in place by machine screws or hinges and latches. Self-tapping or sheet metal fasteners are not acceptable.

## **2.3 SUPPORTS**

- A. Hangers and brackets shall be made of steel pipe, channel iron, angle iron or prefabricated steel channel. Prefabricated steel channel shall be by B-Line, Hilti, Powerstrut or Unistrut.
- B. Anchors shall be lead shield anchors or plastic expansion anchors for small loads, and expansion or epoxy anchors for large loads. Powder-driven anchors shall not be used.

## **2.4 LABELS AND DIRECTORIES**

- A. Equipment nameplates shall be engraved .125 inch (1/8") thick laminated plastic, white, with black letters. The engraved letters shall be at least one quarter inch (1/4") high.
- B. Panel directories shall be typed on supplied card stock with panel, or card stock similar in thickness and material as those supplied with the panels. Install supplied clear plastic cover, or one of like material.

# **PART 3 EXECUTION**

## **3.1 RACEWAYS**

- A. Size conduits in accordance with the NEC, but not less than the sizes shown on the drawings. Minimum power and control conduit size shall be 1/2". Minimum telecommunications conduit size shall be 3/4".

- B. Install concealed and exposed conduits parallel to or at right angles to building lines. Where conduits are routed over beams and under corrugated decking, conduits shall be offset 3" below the decking to avoid damage from future decking penetrations.
- C. Conceal conduits wherever possible and practical. When conduits cannot be concealed in finished areas, surface mount in a neat and orderly fashion.
- D. Metal conduits, fittings, enclosures and raceways shall be mechanically joined together in a firm assembly to form a continuous electrical conductor providing effective electrical grounding continuity.
- E. Provide expansion fittings at the intervals specified in the manufacturer's instructions.
- F. Separate raceways from uninsulated steam pipes, hot water pipes, and other hot surfaces by a minimum of 4" horizontally or 12" vertically. Separate raceways from ventilation ducts and insulated pipes so that they do not come into contact with each other.
- G. EMT entering sheet metal enclosures and outlet boxes shall be secured in place by a connector with a locknut. Sufficient thread on the connector or conduit shall extend into the enclosure so that the bushing will butt tight into the connector or conduit. Bushings shall not be used as jamb nuts or in lieu of locknuts.
- H. Flexible metallic conduit to transformers shall not exceed 3'-0" in length, and shall have adequate slack to absorb the maximum vibration.

### **3.2 MOUNTING HEIGHTS**

- A. Except where shown otherwise, install equipment and devices at the following heights:
  - 1. Electrical Panels: 72" A.F.F. to top
  - 2. Safety Switches/Disconnects: Maximum of 72" A.F.F. to top (except top of handle shall not exceed 78" A.F.F.)

### **3.3 SUPPORTS**

- A. Support all electrical items independently of supports provided by the other trades.
- B. Support conduits and boxes using steel conduit straps or 1/4-inch minimum diameter threaded rod hangers. Suspended ceiling hangers or hanger wire shall not be used (except to support flexible metallic conduit and manufactured wiring systems).
- C. Hangers shall be of sufficient strength that their deflection at mid span does not exceed 1/240 of the hanger span length after the cables are installed.
- D. Route flexible metallic conduit parallel to or perpendicular to building lines, and in a neat and workmanlike manner.

### **3.4 PENETRATIONS, SLEEVES, AND FIRE SEALS**

- A. Cut floor and wall penetrations neatly and to the minimum size required for installation of the equipment and raceways.

- B. Patch both sides of wall penetrations cut for electrical equipment and raceways to seal against the passage of air, sound and fire.
  - 1. Seal conduit penetrations in fire rated walls using fire-sealing caulk approved by a Nationally Recognized Testing Laboratory.
  - 2. Seal conduit penetrations in non-rated walls using masonry materials that match the wall construction.

### **3.5 EXPANSION FITTINGS**

- A. Provide expansion fittings at all building expansion joints. Expansion fittings shall be bonded to the raceway on both sides.
- B. Provide expansion fittings, in accordance with manufacture recommendations, in all areas subject to swings in temperature of more than 15 degrees C.
- C. Install expansion fittings in all locations where expected expansion difference is  $\frac{1}{4}$ ", or more, between boxes

### **3.6 IDENTIFICATION**

- A. Provide nameplates and labels in accordance with Article 2.6.
  - 1. Laminated plastic labels shall be mechanically secured in place with sheet metal screws and/or bolts and nuts
  - 2. Labels shall be neatly centered. Place labels in like positions on similar equipment.
- B. Color code wiring as noted in Section 260513
- C. Mark junction box covers in indelible ink with the panel and breaker numbers of the circuits contained within.
- D. Provide a 3" by 5" yellow "Warning Arc Flash Hazard" label on the outside of panels in 'occupant areas' - Brady Type 99454 or equivalent from another manufacturer. Center the label horizontally and vertically on outside of door.

**END OF SECTION 260533**



## **SECTION 260800 - ELECTRICAL ACCEPTANCE TESTS**

### **PART 1 GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract and other applicable Specification Sections including the Related Sections listed below, apply to this Section.

#### **1.2 TESTS**

- A. Perform the visual inspections, manual operations and tests on systems and equipment as described in Part 3, "Execution".
- B. Tests shall be performed and documented by the electrical contractor or a direct sub-contractor of the electrical contractor.

#### **1.3 TEST REPORTS**

- A. Provide written test reports, signed and dated, for all tests prior to acceptance of the tested equipment by the Owner. Test reports on Megger, dielectric absorption and high potential tests shall include the ambient temperature and relative humidity existing at the time of the tests.

### **PART 2 PRODUCTS (NOT APPLICABLE)**

### **PART 3 EXECUTION**

#### **3.1 VISUAL INSPECTIONS**

- A. Prior to any testing, perform visual inspections to verify the following:
  - 1. The equipment is completely and properly installed
  - 2. The equipment is free from damage and defects
  - 3. Shipping blocks and restraints have been removed
  - 4. Electrical terminations have been properly tightened
  - 5. The equipment has been properly aligned
  - 6. The equipment has been properly lubricated
  - 7. The ventilation louvers are open and unobstructed
  - 8. The equipment is ready to be tested

#### **3.2 MANUAL OPERATION**

- A. Prior to any testing, mechanical devices shall be exercised or rotated manually to verify that they operate properly and freely.

#### **3.3 POWER CABLE TESTS**

- A. Perform a continuity check and a 1,000 volt DC Megger test on 600 volt power cables No. 4 AWG and larger.

1. The Megger test shall be performed between each pair of conductors and from each conductor to ground.
2. The Megger test shall be performed for 15 seconds or until the insulation resistance value stabilizes.
3. The insulation resistance between conductors and from each conductor to ground shall be 100 megohms minimum in one minute or less. In addition, the lowest insulation resistance value shall not differ from the highest value by more than 20 percent. If Megger readings for a given circuit or feeder are above 1000 megohms, the 20% balance requirement may be waived.

#### **3.4 GROUNDING TESTS**

- A. Measure the resistance to ground of the total ground system with all connections completed. The resistance shall not exceed 2 ohms for primary services or 5 ohms for secondary services.
- B. Tests of the resistance to ground shall be made using either the three point method or the fall-of-potential method.
- C. Perform a continuity check from equipment ground bus bars and ground lugs to the ground system.

#### **3.5 COMMISSIONING**

- A. Perform Commissioning activities per Related Sections above.

**END OF SECTION 260800**

## SECTION 262900 - MOTOR CONTROLS

### PART 1 GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, Standard General and Supplementary General Conditions, Division 1 Specification Sections, and other applicable Specification Sections including the Related Sections listed below, apply to this Section.
- B. Related Sections:
  - 1. Section 260513 - Medium, Low & Control Voltage Cables
  - 2. Section 260526 - Grounding and Bonding for Electrical
  - 3. Section 260533 - Electrical Materials and Methods
  - 4. Section 260800 - Electrical Acceptance Tests

#### 1.2 SUMMARY

- A. Install the following equipment furnished by others.
  - 1. Variable speed drives and variable speed motor controllers.
  - 2. Motor controls that are shipped loose with packaged mechanical systems.
- B. Provide the following equipment as shown.
  - 1. Disconnect switches

### PART 2 PRODUCTS

#### 2.1 DISCONNECT SWITCHES

- A. Disconnect switches shall be of the voltage and amperage shown, horsepower rated for motor applications, fusible or non-fusible as shown, 3 pole, NEMA Type HD heavy duty, in a NEMA Type 1 enclosure indoors or NEMA Type 3R enclosure outdoors. Provide fuse rejection kits and Class R dual element fuses in fusible disconnect switches. Provide early break auxiliary contacts in motor disconnect switches used with variable frequency drives. Disconnect switches shall be lockable in the open and closed positions. Allen-Bradley, Eaton, GE, Siemens or Square D.

### PART 3 EXECUTION

#### 3.1 INSTALLATION REQUIREMENTS

- A. High temperature detectors (firestats), smoke detectors, low temperature detectors (freezestats), flow switches and other safety controls shall be energized and operational whenever the equipment they protect is operating.
- B. Motor starters shall be wired so that the motors automatically restart after a power disruption. Time delay relays shall be provided for large pumps and fans so that they

can coast down before restarting after a momentary outage, and to prevent all of the large motors from restarting simultaneously.

- C. Motor controls/VFD's installed below piping or in areas with fire protection sprinklers shall be protected by drip shields.

### **3.2 FIELD QUALITY CONTROL**

- A. Perform testing in accordance with Specification Section 260800, and submit a test report.
- B. Perform the following tests, inspections, and related work on MCC's.
  - 1. Perform continuity tests of circuits.
  - 2. Inspect MCC's for defects and physical damage, testing laboratory labels, circuit connections, and nameplate compliance with up-to-date system drawings.
  - 3. Perform operational tests and exercise mechanical components and other operable devices in accordance with manufacturer's instruction manual.
  - 4. Check MCC's anchorage, external clearances, and alignment and fit of components including internal elements.
  - 5. Check tightness of bolted electrical connections with calibrated torque wrench. Refer to manufacturer's instructions for proper torque values.
  - 6. Check phasing of supply source to the bus.
  - 7. Clean interior and exterior of MCC's using manufacturer's approved methods and materials. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

### **3.3 COMMISSIONING**

- A. Perform Commissioning activities per Related Sections above.

### **3.4 TRAINING**

- A. Provide a qualified service technician from the Manufacturer's staff to provide training.
- B. Train Owner's maintenance personnel on equipment operation, start-up and shutdown, trouble-shooting, servicing and preventative maintenance procedures. Review the data contained in the Operating and Maintenance Manuals with Owner's personnel. Training shall occur separate from startup activities.
  - 1. Provide 2 hours of training minimum.

**END OF SECTION 262900**

# MONTANA STATE UNIVERSITY - COBLEIGH HALL - BOZEMAN, MT COLD CHAMBERS COOLING TOWER REPLACEMENT

PPA NO. - 18-2194

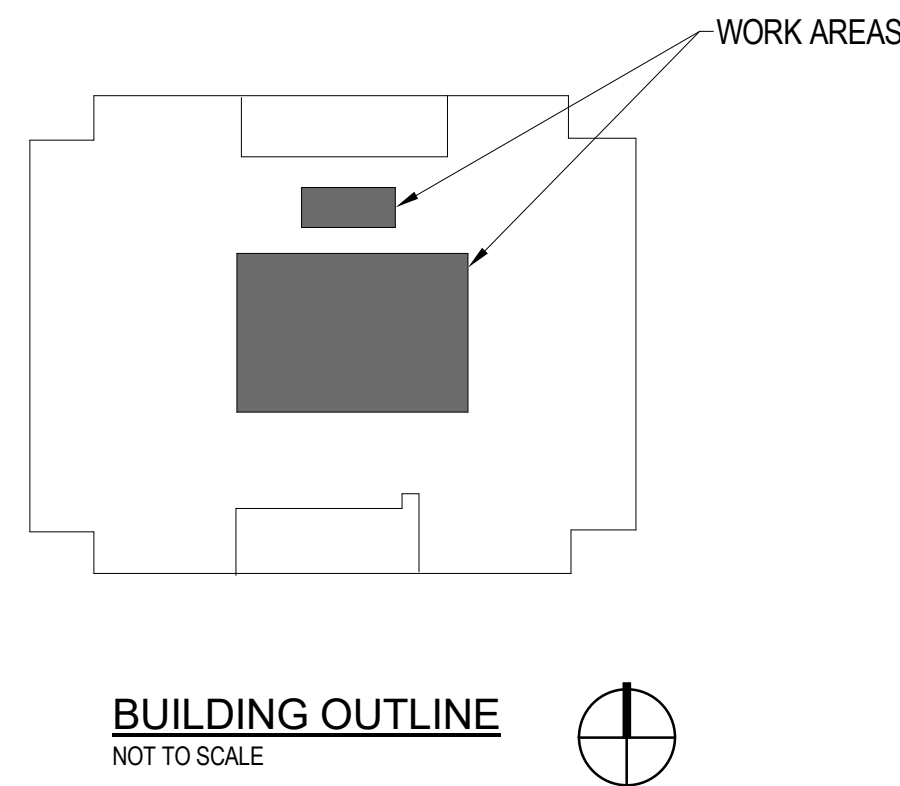
## PROJECT TEAM:

**OWNER:**  
MONTANA STATE UNIVERSITY  
BOZEMAN, MONTANA  
OFFICE: (406) 994-5413  
FAX: (406) 994-5665

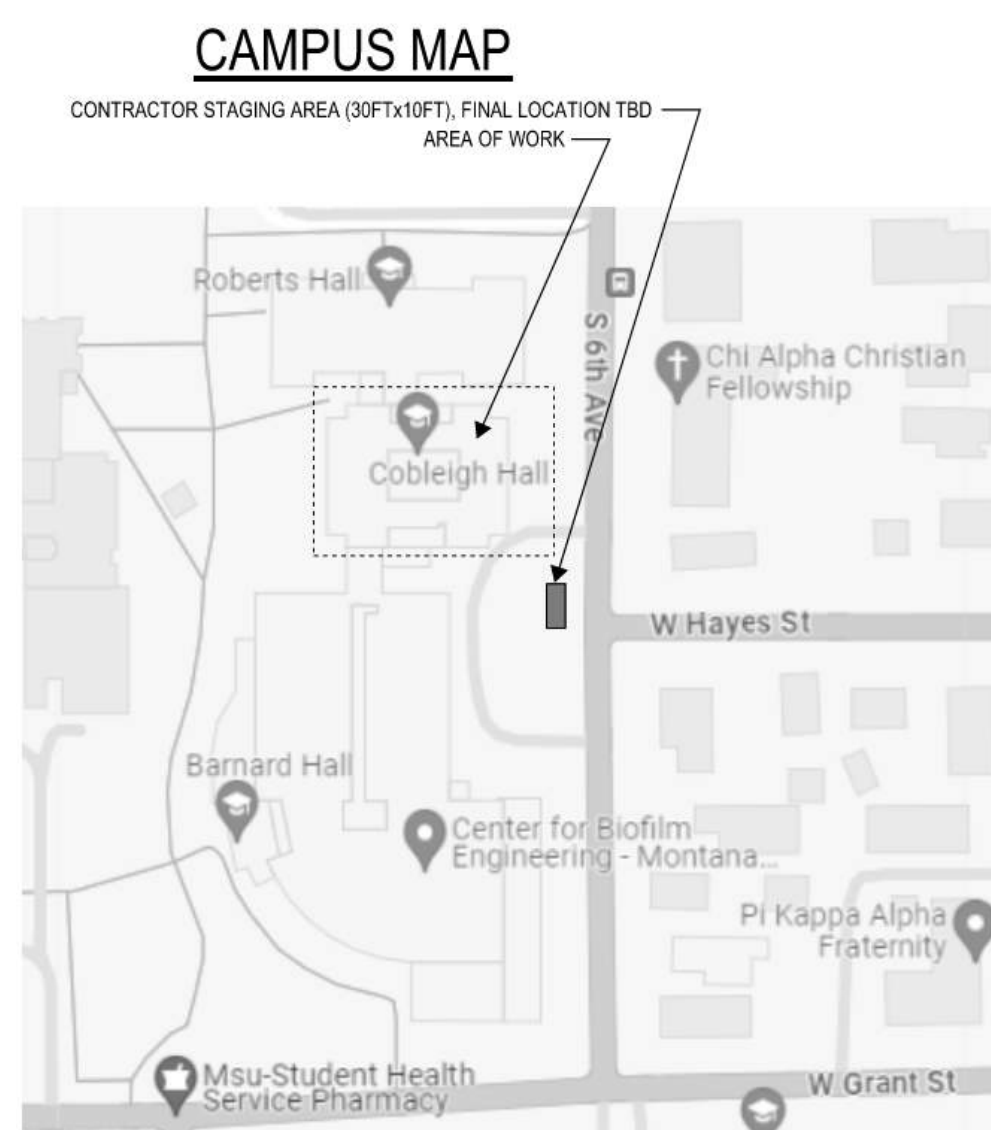
**MECHANICAL ENGINEER:**  
MCKINSTRY CO, LLC  
620 WEST ADDISON ST.  
MISSOULA, MT 59802  
OFFICE: 406-214-3500

**STRUCTURAL ENGINEER:**  
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MISSOULA, MT 59802  
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**ELECTRICAL ENGINEER:**  
CDS ENGINEERING  
7540 CHURCHILL ROAD  
MANHATTAN, MT 59741  
OFFICE: 406-282-7802



SHEET INDEX	
SHEET NO	SHEET NAME
M-001	MECHANICAL LEGEND & ABBREVIATIONS
M-002	MECHANICAL CONTROLS
M-060	MECHANICAL SCHEDULES AND DETAILS
M-061	MECHANICAL DETAILS
MP101	MECHANICAL - ROOF PLAN
N-400	ENLARGED PENTHOUSE PLAN
ND-400	ENLARGED PENTHOUSE DEMOLITION PLAN
ED1.1	ROOF PLAN - POWER DEMO
E1.1	ROOF PLAN - POWER REMODEL
S1.00	MECH PLATFORM FRAMING PLAN, NOTES AND DETAILS



## GENERAL NOTES:

- THE CONTRACTOR IS RESPONSIBLE TO VISIT THE SITE AND DETERMINE THE EXACT EXTENT OF WORK, COORDINATION, DEMOLITION, ETC. NECESSARY TO COMPLETE THE PROJECT AS INDICATED IN THE CONTRACT DOCUMENTS.
- INTERRUPTIONS OF SERVICES (POWER, WATER, HVAC, ETC.) AND WORK IN OCCUPIED TENANT SPACES MUST BE SCHEDULED THRU THE BUILDING MANAGER A MINIMUM OF 2 BUSINESS DAYS IN ADVANCE. ANY INTERRUPTIONS OR CONSTRUCTION WHICH WILL AFFECT NORMAL OPERATION OF THE BUILDING OR TENANTS MUST BE SCHEDULED, WITH THE MCKINSTRY CONSTRUCTION MANAGER'S APPROVAL, ON AN AFTER-HOURS BASIS.
- VERIFY PHYSICAL DIMENSIONS OF EQUIPMENT. COORDINATE THE EXACT LOCATIONS OF NEW MECHANICAL AND PLUMBING EQUIPMENT WITH THE LOCATIONS OF LIGHTING FIXTURES, PIPING, AND OTHER CONSTRUCTION, TO ALLOW FOR PROPER ACCESS TO SERVICE AND MAINTAIN EQUIPMENT PRIOR TO START OF CONSTRUCTION.
- COORDINATE THE LOCATION OF PIPING WITH OTHER TRADES. PROVIDE OFFSETS IN PIPING AS REQUIRED AT NO ADDITIONAL COST TO OWNER.
- SUPPORT CONDUIT AND PIPING INDEPENDENTLY. SUPPORTS ARE INDEPENDENT OF PARTITION AND CEILING SYSTEM SUPPORTS.
- CUTTING, CORE-DRILLING, FRAMING, PATCHING, AND PAINTING OF WALL, CEILING, AND FLOOR OPENINGS SHALL BE BY THE CONTRACTOR REQUIRING THE OPENING.
- REFER TO STRUCTURAL DRAWINGS FOR EQUIPMENT SUPPORTS.
- UNIT WEIGHTS AND LOCATIONS HAVE BEEN COORDINATED TO DETERMINE BUILDING STRUCTURAL ADEQUACY. IF IT IS NECESSARY TO RELOCATE A UNIT, NOTIFY MCKINSTRY ENGINEERING DEPARTMENT FOR RE-COORDINATION.
- PROVIDE SEISMIC RESTRAINTS AND ANCHORAGE PER SMACNA AND THE INTERNATIONAL BUILDING CODE FOR PIPING, AND EQUIPMENT.
- CUTTING, PATCHING AND FLASHING OF ROOF EQUIPMENT AND PIPING SUPPORTS SHALL BE BY THE CONTRACTOR REQUIRING THE OPENING. MAINTAIN ALL REQUIRED ROOF WARRANTIES AND SUBMIT SUPPORTING DOCUMENTATION.
- SLEEPERS, HOUSEKEEPING PADS, EMBED PLATES, AND CANT STRIPS SHALL BE BUILT AND FASTENED TO THE ROOF BY THE CONTRACTOR PROVIDING THE EQUIPMENT. TOP OF THE CURB MUST BE FLAT TO PROVIDE AN ACCEPTABLE SEALING SURFACE. MAXIMUM ALLOWABLE DEVIATION FROM LEVEL SHALL BE 1/8" IN 10'. ROOF CURBS AND SLEEPERS MUST BE SECURELY FASTENED TO STRUCTURAL SUPPORT MEMBERS.
- PROVIDE PIPE, VALVE AND EQUIPMENT LABELING FOR IDENTIFICATION. MATCH OWNERS EXISTING LABELING SCHEME IF APPLICABLE. PIPE LABELING SHALL INCLUDE FLOW DIRECTIONAL ARROWS.

### CONTROLS SYSTEM AND GRAPHIC NOTES:

- A NEW UNITARY CONTROLLER SHALL BE PROVIDED BY THE TEMPERATURE CONTROLS CONTRACTOR FOR THE MONITORING OF THE ADIABATIC EVAPORATIVE FLUID COOLER (BACNET INTERFACE), CONDENSER WATER SUPPLY AND RETURN TEMPERATURES AND CONTROL OF THE MODULATING BY-PASS VALVE. THE EXISTING BAS CONTROLLER SERVING THE INDOOR EVAPORATIVE TOWER, SPRAY TREE PUMPS AND REMOTE SUMP SHALL REMAIN IN PLACE FOR A 90 DAY RUN PERIOD AND A GRAPHICAL PUSHBUTTON ON THE BAS SHALL BE PROVIDED TO RENABLE THE SYSTEM FOR EMERGENCY USE. FOLLOWING THE 90 DAY RUN PERIOD, CONTROLS FOR THE EXISTING SPRAY TREE PUMPS/EVAPORATIVE COOLER SHALL BE REMOVED FROM THE PENTHOUSE ALONG WITH THEIR ASSOCIATED GRAPHICS. THE ABILITY TO MANIPULATE THE ASPECTS OF SCHEDULING AND SET POINTS FOR THE FACILITY SHALL BE INCORPORATED INTO THE CONTROLS DELIVERABLE.
- GRAPHICS SHALL BE LINKABLE TO SPECIFIC EQUIPMENT, SYSTEM POINTS AND OPERATING PARAMETERS WHICH ALLOW FOR ONE CLICK DIAGNOSIS WHEN ISSUES ARE IDENTIFIED.
  - CLOSED CONDENSER WATER SYSTEM PRESSURE: SHALL BE 5 PSIG AT SYSTEM HIGH POINT WITH THE CONDENSER WATER PUMPS DE-ENERGIZED.
  - SET THE GLYCOL FEEDER PRESSURE REGULATING VALVE TO 45 PSIG.

- GRAPHICS SHALL HAVE DROP DOWN WINDOWS LINKING REFERENCES TO THE CONTROL DRAWINGS, SEQUENCES OF OPERATION, CONTROL PARAMETERS AND SPECIFIC EQUIPMENT/SYSTEM INFORMATION.
- REFERENCE THE SEQUENCE OF OPERATION CONTAINED WITHIN THESE CONSTRUCTION DOCUMENTS FOR ADDITIONAL CONTROLS REQUIREMENTS.

### ELECTRICAL COORDINATION NOTES:

- PIPING SUBCONTRACTOR SHALL PROVIDE SELF-LIMITING HEAT TAPE ON OUTDOOR CONDENSER WATER PIPING AND NON-POTABLE WATER EVAPORATIVE MEDIA MAKE-UP WATER PIPING. HEAT TAPE SHALL BE SELF REGULATING BASED ON PIPE TEMPERATURE.
- WHERE INDICATED ON THE EQUIPMENT SCHEDULES, THE EQUIPMENT COMES COMPLETE FROM THE FACTORY WITH MOTOR CONTROLS AS REQUIRED. ELECTRICIAN SHALL PROVIDE SERVICE AND A DISCONNECT PER CODE, AND POWER WIRING, INCLUDING CONNECTING TO EQUIPMENT.

### PIPING NOTES:

- INSTALL AIR VENTS AT HIGH POINTS IN CONDENSER WATER PIPING. INSTALL DRAIN VALVES IN LOW POINTS IN CONDENSER WATER PIPING.
- PROVIDE FLANGES OR UNIONS AT PIPING CONNECTIONS TO EQUIPMENT, COILS, TRAPS, CONTROL VALVES, AND OTHER COMPONENTS TO ALLOW FOR MAINTENANCE.
- PROVIDE REDUCERS AS REQUIRED FROM LINE PIPE SIZE TO EQUIPMENT, COIL, AND CONTROL VALVE CONNECTION SIZES.
- PROVIDE OFFSETS FOR BRANCH LINES TO EQUIPMENT TO ALLOW FOR SERVICE AND MAINTENANCE OF EQUIPMENT.
- PROVIDE DIELECTRIC NIPPLES (BRASS) OR DIELECTRIC FLANGES AT CONNECTIONS OF DISSIMILAR PIPE MATERIALS.
- PROVIDE PRESSURE AND TEMPERATURE TEST PORTS AT SUPPLY AND RETURN PIPING CONNECTIONS TO EQUIPMENT.
- TEMPERATURE WELLS, THERMOMETER WELLS, ECT., SHALL BE MOUNTED HORIZONTALLY TO AVOID AIR TRAPPING.
- SYSTEM FILL AND ANTI-FREEZE:
  - AFTER COMPLETION OF PIPING SYSTEM INSTALLATION AND PRESSURE TESTING, AND BEFORE MAKING CONNECTIONS TO EQUIPMENT, PROVIDE TEMPORARY BY-PASSES AS REQUIRED. REMOVE TRACES OF DIRT, OIL, PIPE JOINT COMPOUND, ETC. BY FLUSHING PIPE SYSTEM WITH MCKINSTRY APPROVED CLEANER AND RUNNING CIRCULATION PUMPS. DRAIN, RE-FILL, AND RE-FLUSH SYSTEM IN ORDER TO REMOVE ALL TRACES OF CHEMICAL CLEANER.
  - AFTER NEW PIPING SYSTEM HAS BEEN THOROUGHLY CLEANED AND PRESSURE TESTED, THE EXISTING GLYCOL MIXTURE SYSTEM FOR THE ENTIRE CONDENSER WATER SYSTEM SHALL BE DRAINED AND FLUSHED IN ITS ENTIRETY. FOLLOWING SYSTEM FLUSHING, FILL THE CONDENSER WATER SYSTEM WITH A PREMIXTURE OF PROPYLENE GLYCOL (35%) AND APPROPRIATE INHIBITORS AND DISTILLED WATER.
  - RUN PUMPS TO CIRCULATE UNTIL THOROUGHLY MIXED AND AIR HAS BEEN PURGED FROM SYSTEM. THEN, DRAW A SAMPLE OF GLYCOL-WATER MIXTURE AND SEND TO MANUFACTURER'S LABORATORY FOR ANALYSIS. ADD GLYCOL AND/OR INHIBITOR AS DIRECTED BY LAB REPORT. SUBMIT FINAL LAB REPORT TO MCKINSTRY ENGINEERING DEPARTMENT.
  - PRESSURIZE SYSTEM ACCORDING TO THE FOLLOWING SCHEDULE:
    - CLOSED CONDENSER WATER SYSTEM PRESSURE: SHALL BE 5 PSIG AT SYSTEM HIGH POINT WITH THE CONDENSER WATER PUMPS DE-ENERGIZED.
    - SET THE GLYCOL FEEDER PRESSURE REGULATING VALVE TO 45 PSIG.

## ABBREVIATIONS

GENERAL	
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
BHP	BRAKE HORSEPOWER
BOP	BOTTOM OF PIPE
BOT	BOTTOM
CL	CENTER LINE
CSR	CURRENT SENSING RELAY
DN	DOWN
DS	DISCONNECT SWITCH; DOOR SWITCH
(E)	EXISTING
EA	EACH
(F)	FUTURE
FLX	FLEXIBLE
FLR	FLOOR
GC	GENERAL CONTRACTOR
HP	HORSEPOWER; HIGH PRESSURE
HTG	HEATING
HTR	HEATER
ID	INSIDE DIAMETER/DIMENSION
IN WC	INCHES WATER COLUMN
LS	LEVEL SENSOR
MC	MECHANICAL CONTRACTOR
MFR	MANUFACTURER
MTD	MOUNTED
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN; NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
POC	POINT OF CONNECTION
QTY	QUANTITY
(R)	RELOCATED
REQD	REQUIRED
SECT	SECTION
SPEC	SPECIFICATION
STD	STANDARD
TBD	TO BE DETERMINED
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TYP	TYPICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
VFD	VARIABLE FREQUENCY DRIVE
VSD	VARIABLE SPEED DRIVE
W/	WITH
W/O	WITHOUT
WC	WATER COLUMN
WG	WATER GAUGE
PIPING	
CNDS	CONDENSATE
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
EWT	ENTERING WATER TEMPERATURE
5F G	NATURAL GAS - LOW PRESSURE, 5 PSI
SCW	SOFTENED COLD WATER
SRV	STEAM RELIEF VENT
TOP	TOP OF PIPE

## PIPING IDENTIFICATION

CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
CTS	COOLING TOWER WATER SPRAY SUPPLY
CTR	COOLING TOWER WATER SPRAY RETURN
NPW	NON-POTABLE WATER

## PIPING FITTINGS

TEE UP	TEE UP
TEE DOWN	TEE DOWN
TEE DN W/ ELBOW	TEE DN W/ ELBOW
TEE UP W/ ELBOW	TEE UP W/ ELBOW
90° ELBOW UP	90° ELBOW UP
90° ELBOW DN	90° ELBOW DN
CAP	CAP
UNION	UNION
FLANGE	FLANGE
FLEX HOSE CONNECTION	FLEX HOSE CONNECTION
DOUBLE BELLOW FLEX CONNECTION	DOUBLE BELLOW FLEX CONNECTION
SINGLE BELLOW FLEX CONNECTION	SINGLE BELLOW FLEX CONNECTION
FLOW ARROW	FLOW ARROW
REDUCER	REDUCER
SLOPE SYMBOL	SLOPE SYMBOL
BREAK OR CONTINUATION SYMBOL	BREAK OR CONTINUATION SYMBOL
DOWN SPOUT NOZZLE	DOWN SPOUT NOZZLE
CLEANOUT	CLEANOUT

## INSTRUMENTATION AND CONTROLS

2-WAY CONTROL VALVE	2-WAY CONTROL VALVE
3-WAY CONTROL VALVE	3-WAY CONTROL VALVE
PRESSURE REDUCING VALVE	PRESSURE REDUCING VALVE
PNEUMATIC CONTROL VALVE	PNEUMATIC CONTROL VALVE
RELIEF VALVE	RELIEF VALVE
BALL VALVE	BALL VALVE
3-WAY GATE VALVE	3-WAY GATE VALVE
BUTTERFLY VALVE	BUTTERFLY VALVE
DIAPHRAGM VALVE	DIAPHRAGM VALVE
CHECK VALVE	CHECK VALVE
NEEDLE VALVE	NEEDLE VALVE
GLOBE VALVE	GLOBE VALVE
GLOBE VALVE ANGLE	GLOBE VALVE ANGLE
GLOBE VALVE 3-WAY	GLOBE VALVE 3-WAY
GATE VALVE	GATE VALVE
PLUG VALVE	PLUG VALVE
BALANCING VALVE	BALANCING VALVE
HOSE BIBB	HOSE BIBB
AUTO FLOW VALVE	AUTO FLOW VALVE
PUMP	PUMP
MANUAL AIR VENT	MANUAL AIR VENT
AUTOMATIC AIR VENT	AUTOMATIC AIR VENT
HIGH CAPACITY AIR VENT	HIGH CAPACITY AIR VENT
SHOCK ARRESTOR	SHOCK ARRESTOR
FLOW SWITCH	FLOW SWITCH
VACUUM BREAKER	VACUUM BREAKER
PRESSURE GAUGE	PRESSURE GAUGE
TEMPERATURE SENSOR	TEMPERATURE SENSOR
HYDRONIC TEMPERATURE SENSOR	HYDRONIC TEMPERATURE SENSOR
TEMPERATURE INDICATOR	TEMPERATURE INDICATOR
Y STRAINER W/ BALL VALVE	Y STRAINER W/ BALL VALVE
PIPE SLEEVE	PIPE SLEEVE
PETES PLUG	PETES PLUG
SUCTION DIFFUSER W/ STRAINER	SUCTION DIFFUSER W/ STRAINER
REDUCED PRESSURE BACKFLOW PREVENTER	REDUCED PRESSURE BACKFLOW PREVENTER
HYDRONIC DIFFERENTIAL PRESSURE SENSOR	HYDRONIC DIFFERENTIAL PRESSURE SENSOR
LEAK DETECTOR / MOISTURE SENSOR	LEAK DETECTOR / MOISTURE SENSOR
SPACE TEMPERATURE SENSOR	SPACE TEMPERATURE SENSOR
SPACE NITROGEN DIOXIDE SENSOR	SPACE NITROGEN DIOXIDE SENSOR
OUTDOOR AIR TEMPERATURE SENSOR	OUTDOOR AIR TEMPERATURE SENSOR
VARIABLE FREQUENCY DRIVE	VARIABLE FREQUENCY DRIVE
MOTOR STARTER	MOTOR STARTER
CONTROL RELAY	CONTROL RELAY
CURRENT SENSOR	CURRENT SENSOR
PRESSURE TRANSDUCER	PRESSURE TRANSDUCER

## GENERAL INFORMATION SYMBOLS

NEW SCOPE	NEW SCOPE
FUTURE SCOPE	FUTURE SCOPE
DEMOLISHED SCOPE	DEMOLISHED SCOPE
EXISTING SYSTEMS	EXISTING SYSTEMS
POINT OF CONNECTION	POINT OF CONNECTION
POINT OF DEMOLITION	POINT OF DEMOLITION
CENTERLINE	CENTERLINE
KEY NOTE REFERENCE	KEY NOTE REFERENCE
PIPING RISER CALLOUT (CHW; HW)	PIPING RISER CALLOUT (CHW; HW)
PIPING RISER #	PIPING RISER #
DETAIL OR DIAGRAM NUMBER	DETAIL OR DIAGRAM NUMBER
SHEET NUMBER WHERE DETAIL/DIAGRAM SHOWN	SHEET NUMBER WHERE DETAIL/DIAGRAM SHOWN
SECTION NUMBER	SECTION NUMBER
SHEET NUMBER WHERE SECTION SHOWN	SHEET NUMBER WHERE SECTION SHOWN
REVISION NUMBER	REVISION NUMBER
REVISION CLOUD - DENOTES AREA OF CHANGE	REVISION CLOUD - DENOTES AREA OF CHANGE
DETAIL REFERENCE OUTLINE WITH NUMBER AND SHEET LOCATION	DETAIL REFERENCE OUTLINE WITH NUMBER AND SHEET LOCATION



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**MSU - COBLEIGH HALL**  
COLD CHAMBERS COOLING TOWER REPLACEMENT

01/04/2024 - 100% CONSTRUCTION DOCUMENTS

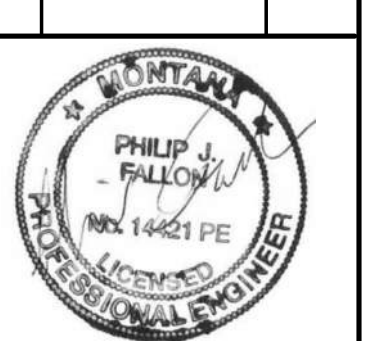


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REV. DESCRIPTION DATE



PPA#18-2194

MCKINSTRY#207626

**SHEET TITLE**  
MECHANICAL LEGEND & ABBREVIATIONS

**SHEET**

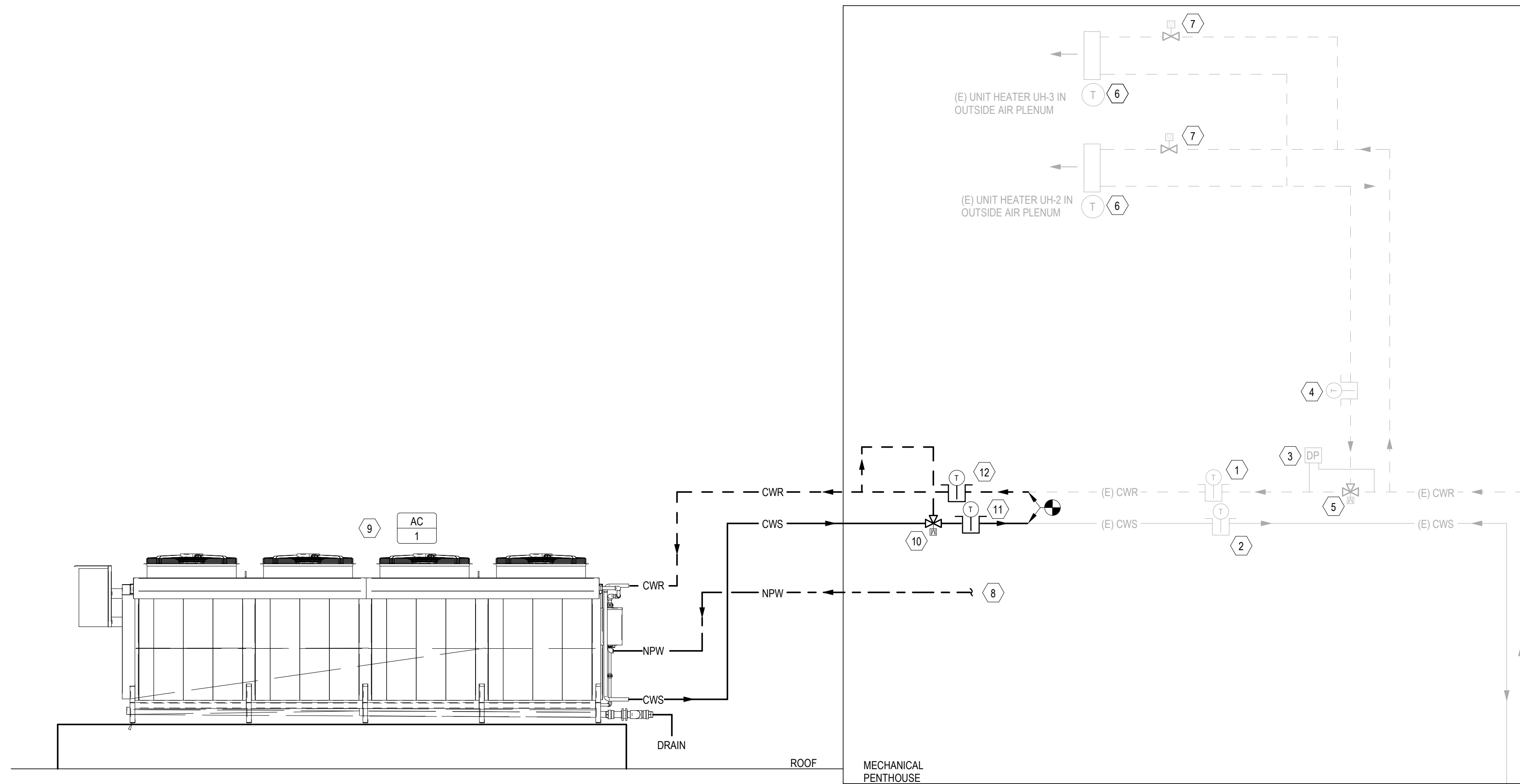
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**DATE**

01-04-2024

**KEYNOTES**

- EXISTING CONDENSER WATER RETURN TEMPERATURE SENSOR. SENSOR TO REMAIN ON EXISTING BAS CONTROLLER FOR BACK-UP SYSTEM.
- EXISTING CONDENSER WATER SUPPLY TEMPERATURE SENSOR. SENSOR TO REMAIN ON EXISTING BAS CONTROLLER FOR BACK-UP SYSTEM.
- EXISTING PRESSURE DIFFERENTIAL TRANSMITTER.
- EXISTING CONDENSER WATER RETURN SENSOR (FROM OA PLENUM UNIT HEATERS).
- EXISTING 2" HEAT RECOVERY 3-WAY VALVE TO REMAIN.
- EXISTING SPACE (OA PLENUM) TEMPERATURE SENSOR.
- EXISTING TWO-WAY T.C. VALVE.
- NON-POTABLE WATER FROM SOFTENING SYSTEM.
- ADIABATIC FLUID COOLER. PIPE PER DETAIL.
- 3" FULLY MODULATING DDC MOTORIZED 3-WAY GLOBE STYLE MIXING VALVE (CV=90).
- DDC TEMPERATURE SENSOR FOR CONDENSER WATER SUPPLY TO NEW BAS CONTROLLER. SENSOR SHALL BE USED FOR CONTROL OF BY-PASS VALVE.
- DDC TEMPERATURE SENSOR FOR CONDENSER WATER RETURN TO NEW BAS CONTROLLER.



**1 ADIABATIC COOLING TOWER CONTROLS DIAGRAM**  
 SCALE: 12" = 1'-0"

**ADIABATIC CLOSED CIRCUIT COOLER — SEQUENCES OF OPERATION**

**GENERAL:**  
 THE ROOF MOUNTED CLOSED CIRCUIT ADIABATIC COOLER ON THE ROOF OF THE BUILDING SERVES TO REJECT HEAT FROM THE BUILDING CONDENSER WATER LOOP SERVING THE COLD STORAGE CONDENSING UNITS.

**CONDENSER WATERSIDE SYSTEM:**  
 THE BUILDING CONDENSER WATERSIDE SYSTEM LOOP CONSISTS OF TWO CIRCULATING PUMPS (CWP-1 & CWP-2, CONTROLLED IN A LEAD/STAND-BY ARRANGEMENT), ONE CLOSED CIRCUIT ADIABATIC COOLER MOUNTED ON THE ROOF, AND A HEAT RECOVERY SYSTEM WHICH PRE-HEATS OUTSIDE AIR FOR THE BUILDINGS AIR HANDLING SYSTEMS. THE TEMPERATURE CONTROLS CONTRACTOR SHALL MODIFY THE SYSTEM AND CURRENT SEQUENCE OF OPERATIONS AS FOLLOWS:

- INCREASE THE CONDENSER WATER DIFFERENTIAL PRESSURE SETTING FROM 35 PSIG TO 40 PSIG. TO CONTROL THE PUMP SPEED COMMAND.
- MODIFY THE PARAMETERS OF THE VARIABLE SPEED DRIVES TO PROVIDE A MINIMUM SPEED OF 45 HZ REGARDLESS BAS SPEED COMMAND.
- MODIFY THE VFD PARAMETERS OF ALLOW AN OVERSPEED (UP TO 110% .66 HZ) WITH PROGRAMMED LIMITATION THAT PUMP FLA DOES NOT EXCEED MOTOR NAMEPLATE RATINGS.
- PUMP LEAD/LAG ARRANGEMENT TO REMAIN AS CURRENTLY PROGRAMMED.
- THE HEAT RECOVERY VALVE DIFFERENTIAL PRESSURE SETPOINT IN THE MECHANICAL PENTHOUSE IS CURRENTLY FIXED AT 10 PSIG. T.C.C. SHALL MODIFY SETPOINT TO RESET TO 0 PSIG AT AMBIENT TEMPERATURES ABOVE 55 DEG. F.

THE HEAT REJECTION SYSTEM (ADIABATIC FLUID COOLER AFC-1) SHALL BE IN THE OCCUPIED MODE CONTINUOUSLY TO MAINTAIN THE CONDENSER WATER SUPPLY TEMPERATURE (INITIALLY SET FOR 80 DEG. F.) THRU ITS INTEGRAL CONTROLS BY CYCLING THE EC MOTORS AND CONTROLLING NON-POTABLE WATER FLOW. THE DDC SYSTEM SHALL MODULATE THE 3-WAY MIXING VALVE INSIDE THE PENTHOUSE MECHANICAL SYSTEM TO MAINTAIN A MINIMUM OF 72 DEG. F. AS MEASURED BY THE TEMPERATURE WELL LOCATED DOWNSTREAM FROM ITS POSITION.

THE DDC SYSTEM SHALL INTEGRATE THRU THE BACNET MSTP COMMUNICATION CARD (CONFIRM COMMUNICATIONS MODULE TYPE WITH TEMPERATURE CONTROLS CONTRACTOR PRIOR TO UNIT RELEASE) TO THE ADIABATIC FACTORY CONTROLLER TO MONITOR AND TEND AT A MINIMUM THE FOLLOWING PARAMETERS:

- FAN RPM (EACH).
- FAN ALARM (EACH).
- % AIR VOLUME.
- DIGITAL OUTPUT (STATUS).
- SETPOINT.
- FLUID COOLER SUPPLY AND RETURN TEMPERATURE.
- WATER REGULATING VALVE MODULATION POSITION.

ADDITIONALLY, THE DDC SYSTEM SHALL PICK-UP THE FOLLOWING HARD WIRED DIGITAL OUTPUTS FROM THE FACTORY CONTROLLER:

- PRIORITY 1 FAULTS (DO OUTPUT NO.1).
- PRIORITY 2 WARNINGS (DO OUTPUT NO.2).
- WATER SYSTEM IS IN OPERATION (DO OUTPUT NO.3).

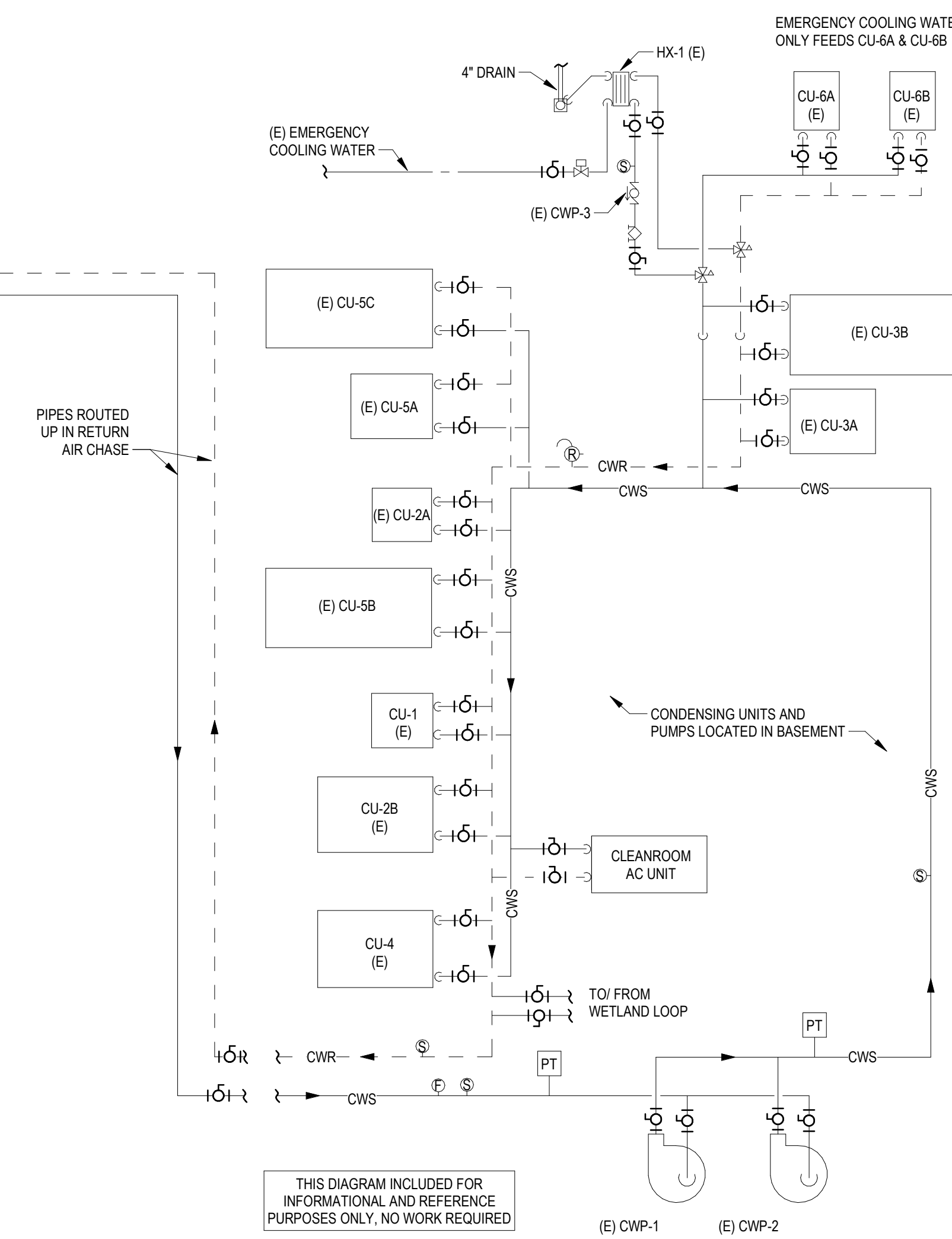
THE OPERATORS WORKSTATION SHALL RECEIVE AN ALARM REQUIRING ACKNOWLEDGMENT WHENEVER THE FOLLOWING CONDITIONS OCCUR:

- THE CONDENSER LOOP SUPPLY WATER TEMPERATURE HAS DROPPED BELOW 55 DEG. OR HAS RISEN ABOVE 90 DEG. FOR A 5-MINUTE TIME PERIOD.
- UPON AN ALARM NOTIFICATION RECEIVED VIA THE BACNET MSTP INTERFACE WITH THE ADIABATIC FLUID COOLER CONTROLLER.
- UPON ALARM NOTIFICATION FROM FACTORY CONTROLLER ON DIGITAL OUTPUTS NO.1 AND NO.2.

REFERENCE FACTORY SEQUENCE OF OPERATIONS PUBLISHED IN IOM MANUAL FOR UNIT SPECIFIC SOO.

**ADIABATIC COOLER WATERSIDE SYSTEM:**

THE TEMPERATURE CONTROLS CONTRACTOR SHALL FURNISH THE 3-WAY, 2-POSITION, BI-DIRECTIONAL, FAST ACTING AUTOMATIC VALVE TO DRAIN THE NON-POTABLE DOMESTIC WATER FROM THE EXTERIOR PIPING FEEDING THE OUTDOOR ADIABATIC COOLER WHEN OUTSIDE AIR TEMPERATURE DROPS BELOW 40 DEG. F. VALVE OPERATION SHALL NOT BE TIED INTO THE BAS SYSTEM, A LINE (120V) OR LOW (24V) VALVE AND ASSOCIATED THERMOSTAT WITH OUTDOOR AIR SENSING BULB SHALL AUTOMATICALLY CONTROL VALVE OPERATION AS DESCRIBED IN THE DOCUMENTS. VALVE INSTALLATION BY THE MECHANICAL CONTRACTOR, ALL WIRING LINE OR LOW VOLTAGE BY THE T.C.C.



**2 LOWER LEVEL CONTROLS DIAGRAM**  
 SCALE: 12" = 1'-0"



## BOOSTER PUMP SCHEDULE

EQUIPMENT CLASSIFICATION	EQUIPMENT ID	LOCATION	DESCRIPTION				PHYSICAL INFO				PERFORMANCE					ELECTRICAL								SPECIFIC NOTES		
			SYSTEM SERVED	MANUFACTURER	MODEL	TYPE AND ARRANGEMENT	LENGTH (IN)	WIDTH (IN)	HEIGHT (IN)	CONNECTION SIZE (HEADER)	MAX. DESIGN PUMP FLOW (GPM)	MINIMUM PUMP FLOW (GPM)	SUCTION PRESSURE (PSIG)	DISCHARGE PRESSURE (PSIG)	MAXIMUM FLUID TEMPERATURE (°F)	QUANTITY OF ELECTRICAL CONNECTIONS	VOLTAGE (V)	PHASE (Ø)	FULL LOAD AMPS (A)	STARTER PROVIDED BY	VFD PROVIDED BY	MOTOR HORSEPOWER (HP)	VARIABLE FREQUENCY DRIVES		DISCONNECT PROVIDED BY	CONTROL METHOD
-	BP-1	PENTHOUSE	ADIABATIC COOLER	GRUNFOSS	CMBE TWIN 1-44	DUPLEX	20	21	18	(2) @ 1.5"	6	0	30	50	140	1	120	1	16 (MAX.)	N/A	INTERGRAL (MFRG.)	(2) @ 1HP EACH	YES	PLUG-IN	INTEGRAL	1 THRU 8

- SPECIFIC NOTES:**
- NEMA 1 UL LISTED CONTROL PANEL, INLET PRESSURE SWITCHES, NON-RETURN VALVE, SINGLE POINT POWER CONNECTION (CABLE AND PLUG-IN).
  - DIAPHRAGM TANKS INCLUDED.
  - STAINLESS STEEL PUMP SLEEVES, IMPELLER, NOZZLE & PUMP SHAFTS
  - MANUAL SETPOINT ADJUSTMENT.
  - INTEGRAL VARIABLE FREQUENCY DRIVES, MOTORS RATED FOR VARIABLE SPEED.
  - PROVIDE WITH PRESSURE GAUGES, PRESSURE SENSORS.
  - PROVIDE WITH FACTORY AUTHORIZED STARTUP.

### HVAC EXPANSION TANK SCHEDULE

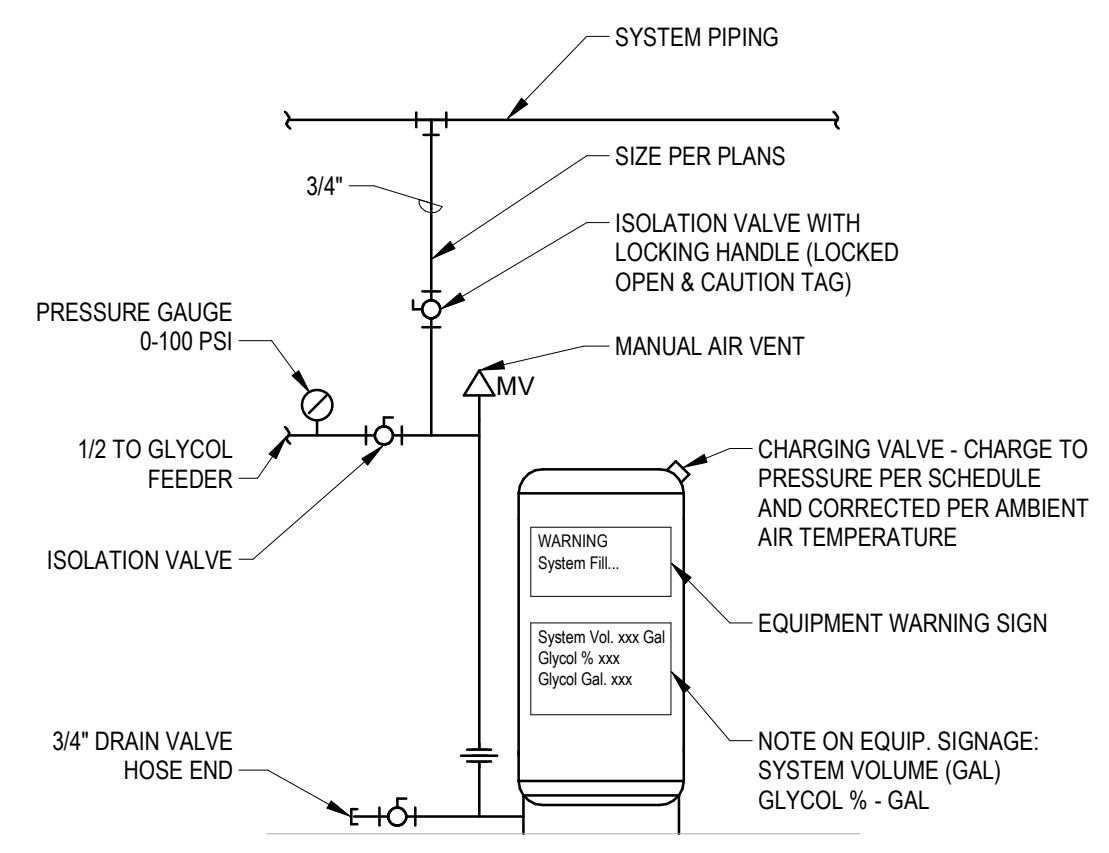
TAG #	ET-1
LOCATION (FLOOR #, GRID INTERSECTION)	BASEMENT MECH. AREA
QUANTITY	1
TYPE AND ARRANGEMENT (DIAPHRAGM/BLADDER, HORIZ/VERT)	DIAPHRAGM
SYSTEM SERVED	CONDENSER WATER SYSTEM
<b>BASIS OF DESIGN</b>	
MANUFACTURER	WESSELS
MODEL NUMBER	NTA-20
TYPE / HORIZONTAL OR VERTICAL	VERTICAL
<b>PHYSICAL DIMENSIONS AND WEIGHT</b>	
DIAMETER x HEIGHT - INCHES	12" X 25"
INLET SIZE - INCHES	0.75"
INLET CONNECTION TYPE	NPT
TANK WEIGHT (LBS)	52 LBS.
<b>PERFORMANCE</b>	
FLUID TYPE	30% PROPYLENE GLYCOL
SYSTEM VOLUME (GALLONS)	TBD
TANK VOLUME REQUIRED (GALLONS)	11
TANK ACCEPTANCE VOLUME REQUIRED (GALLONS)	8.8
SYSTEM TEMPERATURE RANGE (F)	60-90
SYSTEM PRESSURE RANGE AT TANK CONNECTION (PSIG)	45
RELIEF VALVE SETTING (PSIG)	125
ASME RATING REQUIRED	YES
<b>CONSTRUCTION MATERIALS</b>	
SHELL	STEEL
MAXIMUM WORKING PRESSURE - PSIG	125
MAXIMUM OPERATING TEMPERATURE - F	240
<b>NOTES:</b>	
1. CONFIRM PRECHARGE TO MINIMUM OPERATING PRESSURE (45 PSIG) AT TANK LOCATION (COLD WITH PUMPS OFF) PRIOR TO INSTALLATION.	

### WATER SOFTENER SCHEDULE

UNIQUE TAG #	WS-1
LOCATION	PENTHOUSE
TYPE AND ARRANGEMENT	DUPLEX
AREA / SYSTEM SERVED	NON-POTABLE COLD WATER TO COOLER
<b>MANUFACTURER DATA</b>	
SUPPLIER	PURE WATER TECHNOLOGIES
MANUFACTURER/MODEL NUMBER	EVOLVE EVR-844TW
MATERIALS OF CONSTRUCTION - VESSEL	FIBER GLASS
ASME BOILER & PRESS VESSEL CODE CONSTRUCTION (SECTION VIII DIV. 1)	NA
<b>PHYSICAL CHARACTERISTICS</b>	
WIDTH X DEPTH X HEIGHT (MEDIA TANKS TOTAL)	27"W x 52"H
WIDTH X DEPTH X HEIGHT (BRINE TANK)	18"W x 33" H
QUANTITY OF RESIN TANKS	2
QUANTITY OF BRINE TANKS	1
COLD WATER CONNECTION - INCHES	1"
<b>PERFORMANCE CHARACTERISTICS</b>	
CONTINUOUS FLOW (GPM) / PRESSURE DROP (PSI)	5 GPM @ 5.4 PSI
PEAK FLOW (GPM) / PRESSURE DROP (PSI)	11.4 GPM @ 15 PSI
WATER PRESSURE RANGE	30 - 100 PSI
OPERATING TEMPERATURE RANGE	33-100
MAXIMUM OPERATING PRESSURE - (PSIG)	75
CAPACITY (MIN. / MED. / MAX.) (GRAINS/LBS. NaCl)	15,000 @ 3.0 / 21,600 @ 6.0 / 25,600 @ 9.0
<b>ELECTRICAL</b>	
QUANTITY OF ELECTRICAL CONNECTIONS	1 (PLUG - 5)
VOLTAGE / PHASE	120 / 1
MINIMUM OVERCURRENT PROTECTION (MOCP, AMPS)	NA
<b>CONTROLS</b>	
CONTROLLER	UNIT MOUNTED
<b>NOTES:</b>	
1. ELECTRICAL OUTLET BY ELECTRICAL CONTRACTOR TO BE WITHIN 5' OF UNIT	
2. INSTALL SIPHON BREAK ON DRAIN. SEE DETAIL. ROUTE DRAIN TO FLOOR SINK BY PLUMBING CONTRACTOR	
3. IF SYSTEM USES FRP TANKS, INSTALL A VACUUM BREAKER ON EACH TANK.	
4. PROVIDE FACTORY CERTIFIED START-UP.	

### ADIABATIC FLUID COOLER SCHEDULE

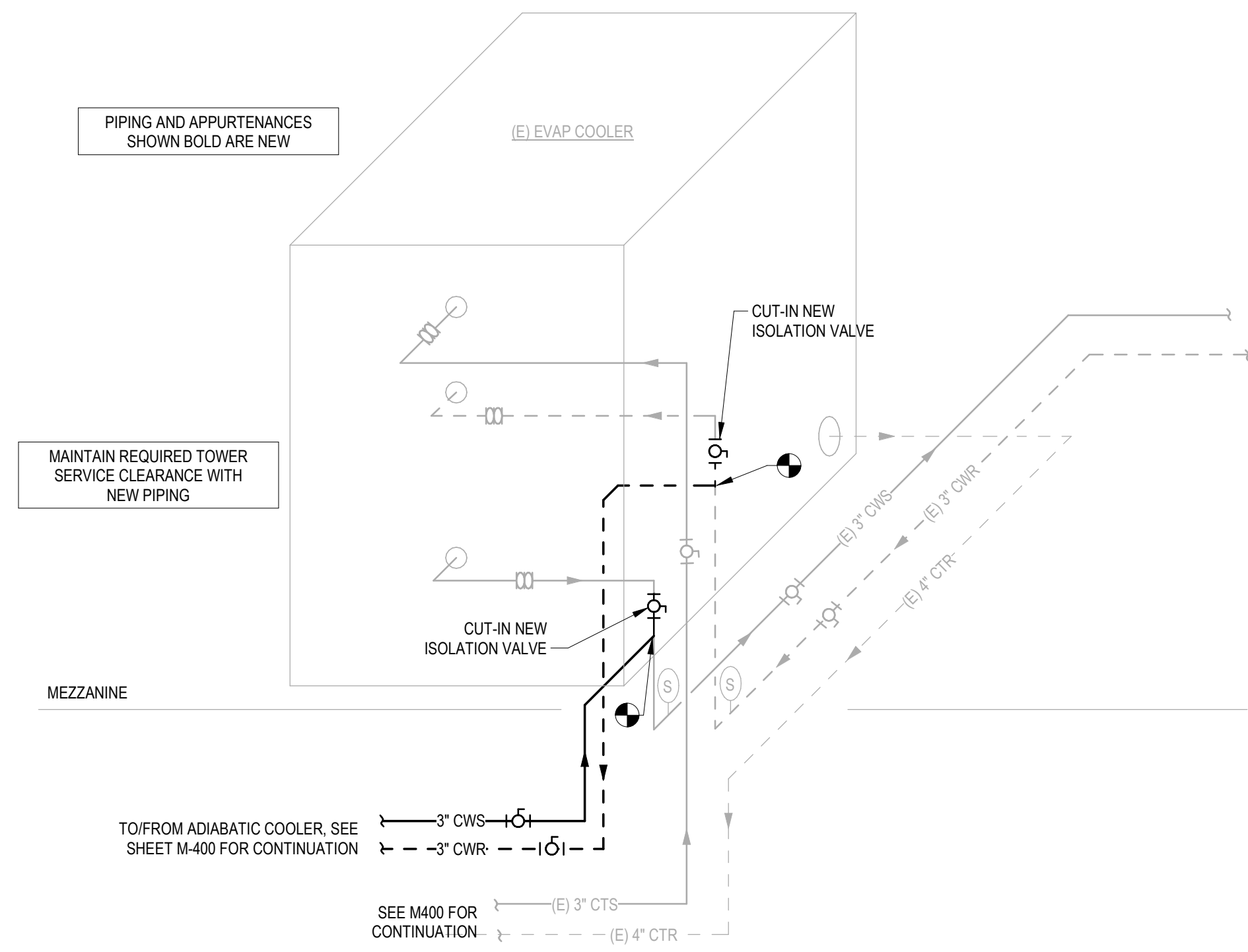
DESCRIPTION	AFC-1
TAG	ROOF
LOCATION	5000 FT
SITE ELEVATION	
TYPE AND ARRANGEMENT	OUTDOOR, CLOSED CIRCUIT ADIABATIC FLUID COOLER WITH EVAPORATIVE COOLING MEDIA ON INLET AIR TO COOLING COILS
AREA / SYSTEM SERVED	CONDENSER WATER SYSTEM
<b>MANUFACTURER DATA / BASIS OF DESIGN</b>	
MANUFACTURER	GUNTNER - HYDROBLU
MODEL NUMBER	GFW 090.2A046AA-E365U04P-M
<b>PHYSICAL DIMENSIONS</b>	
OVERALL LENGTH / WIDTH / HEIGHT	56"W x 234"L x 69" H
SHIPPING WEIGHT / OPERATING WEIGHT	4,533 LBS. / 4,301 LBS.
<b>PERFORMANCE / SELECTION CRITERIA</b>	
WET PERFORMANCE CAPACITY (MBH)	672 MBH
WET PERFORMANCE CAPACITY (EWT / LWT) (40% PROP. GLYCOL)	90 / 80 DEG. F.
WET PERFORMANCE CAPACITY (EAT DBWB)	95 / 63 DEG. F.
DRY PERFORMANCE (FULL CAPACITY SWITCH)	71.2 DEG. F.
# OF FANS	QTY. OF 4
MOTOR TYPE	ELECTRONICALLY COMMUTATED EC MOTORs
TOTAL FAN POWER IN/OUT	14.2 KW / 17.5 HP
COIL FLOW RATE	145 GPM
COIL EWT / LWT, FLUID	90 DEG. F. / 80 DEG. F., 35% PROP. GLYCOL
PRESSURE DROP THRU COIL @ 145 GPM	7.9 PSIG
COIL CONNECTIONS INLET	(2) @ 2"
COIL CONNECTIONS OUTLET	(2) @ 2"
DRAIN CONNECTION SIZE	(1) @ 2"
WATER CONNECTION SIZE	(1) @ 1"
WATER FLOWRATE DESIGN / MAXIMUM (EVAP PAD)	3.4 / 6.2 GPM
WATER FLOW PRESSURE INLET REQUIREMENT	20 TO 60 PSI
<b>ELECTRICAL</b>	
QUANTITY OF ELECTRICAL CONNECTIONS	1
UNIT VOLTAGE	460V, 3-PHASE
UNIT FLA	21.6 AMPS
UNIT MCA	22.95 AMPS
UNIT MOCP	25 AMPS
<b>CONTROLS</b>	
CONTROLS	FACTORY
<b>REMARKS:</b>	
1. FURNISH WITH BACNET MSTP FOR DDC SYSTEM INTEGRATION (FOR MONITORING PURPOSES ONLY).	
2. PROVIDE WITH INTEGRAL CONTROLS TO CYCLE FANS/MODULATE FAN SPEED AND CYCLING OF EVAP PAD WATER VALVE TO MAINTAIN LEAVING WATER TEMPERATURE SETPOINT.	
3. PROVIDE WITH GUNTNER STREAMERS, SHIPPED LOOSE FOR HINGED FAN PANELS.	
4. PROVIDE WITH VIBRATION DAMPERS.	
5. PROVIDE WITH FIN AND PAD GUARD.	
6. PROVIDE WITH FLANGE CONNECTIONS, ANSI 150#.	
7. PROVIDE WITH BALL VALVES FOR VENT AND DRAIN.	
8. PROVIDE WITH ELECTRIC HEATER, FAN AND THERMOSTAT IN NEMA 4 ENCLOSURE/CONTROL PANEL.	
9. PROVIDE SEISMIC CALCULATIONS AND WIND LOADING FOR UNIT CONSTRUCTION AND ANCHORAGE SPECIFIC TO MOUNTING LOCATION.	
10. FURNISH WITH ONE SPARE EC FAN MOTOR / ASSEMBLY, SHIPPED LOOSE.	
11. PROVIDE WITH STRAINER AND CONTROL VALVE FOR EVAP WATER.	
12. PROVIDE WITH FACTORY AUTHORIZED START-UP AND PROGRAMMING.	



NOTE: PIPE EXPANSION TANK TO SUCTION SIDE OF CONDENSER WATER PUMP HEADER. CONTRACTOR MAY UTILIZE EXISTING 3/4" CONNECTION FROM EXISTING TO REMAIN GLYCOL FEEDER AND PROVIDE ADDITIONAL FITTINGS AS REQUIRED.

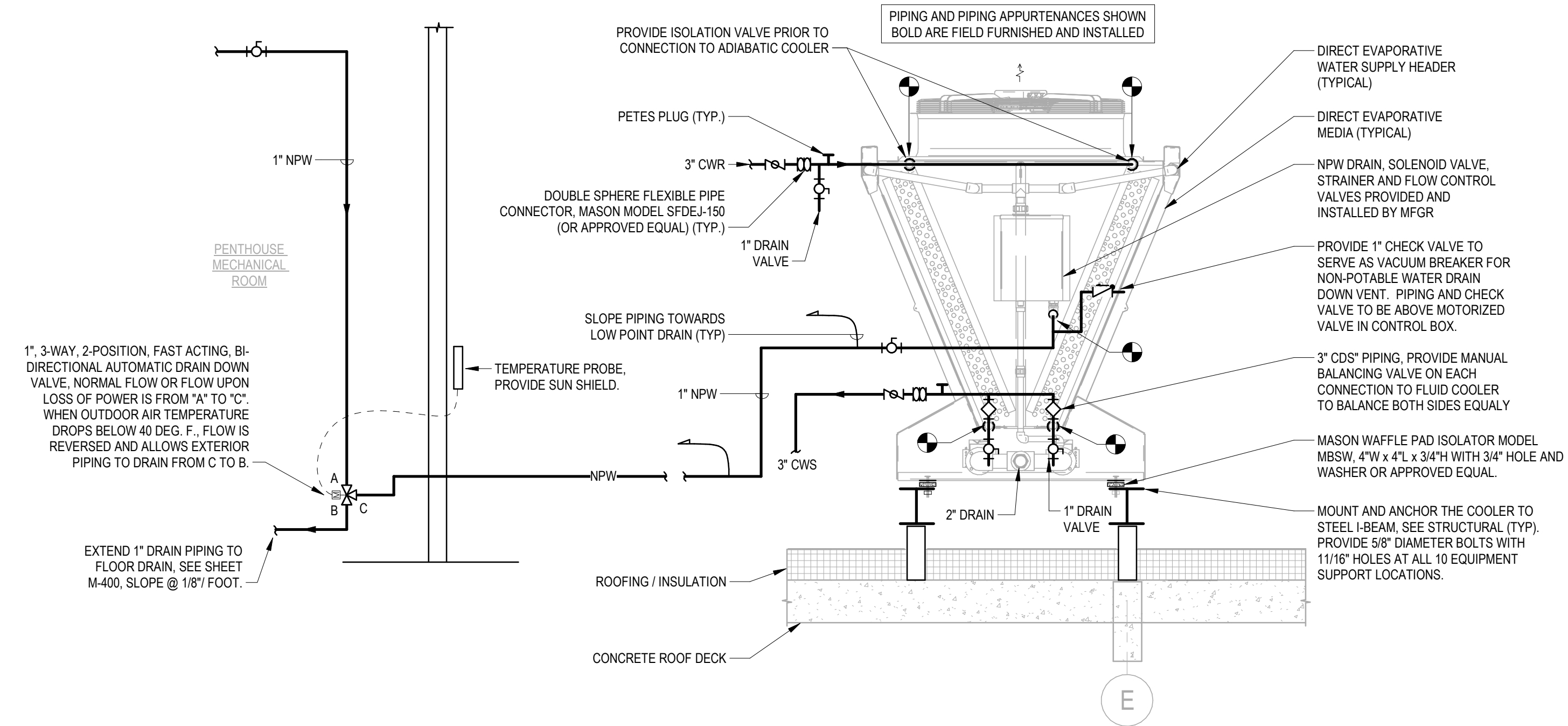
### 1 EXPANSION TANK DETAIL

SCALE: 12" = 1'-0"



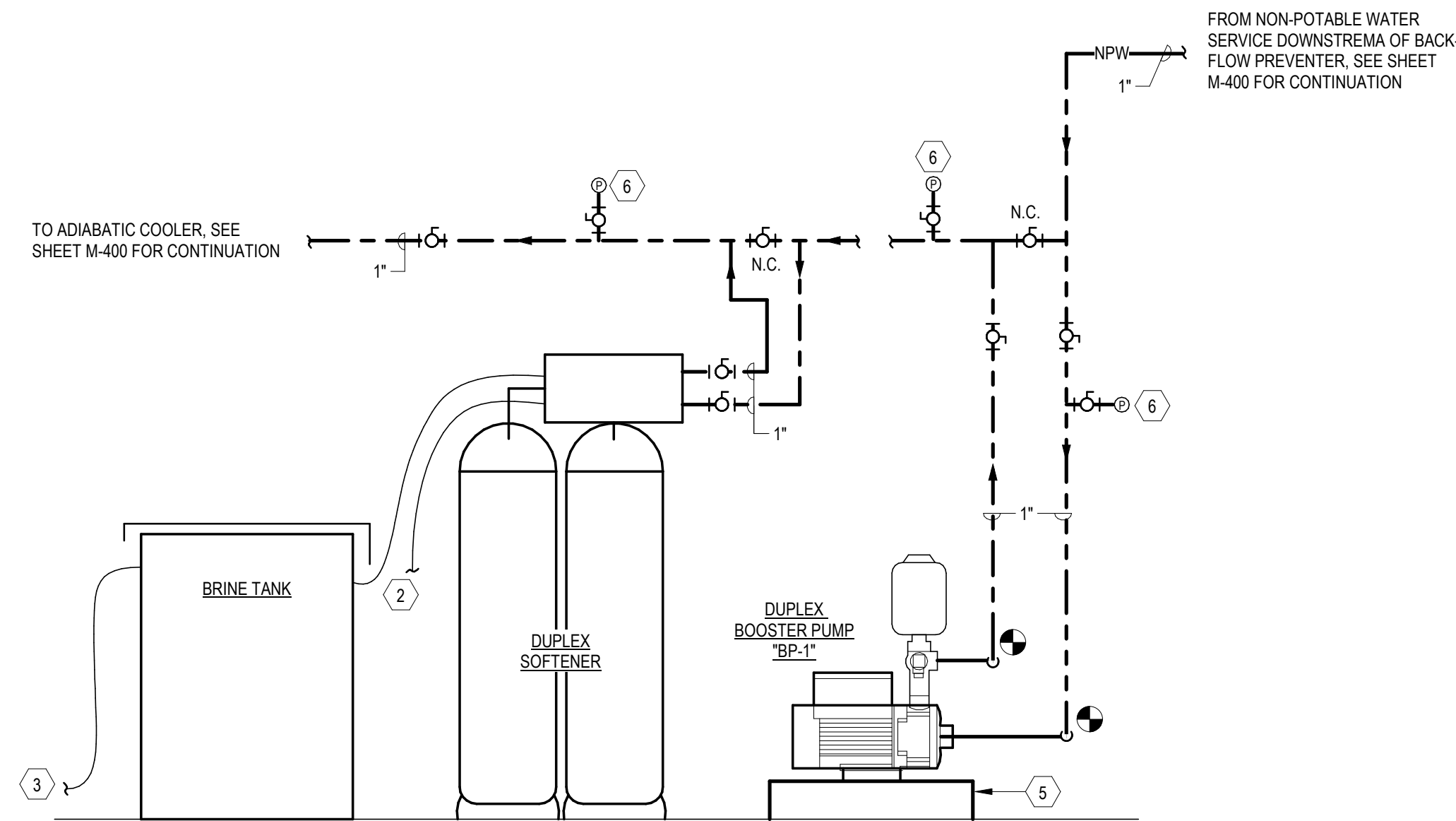
**1 PIPING CONNECTIONS AND MODIFICATIONS AT EXISTING EVAPORATIVE COOLER DETAIL**

SCALE: 1/8" = 1'-0"



**3 ADIABATIC COOLER PIPING DETAIL**

SCALE: 12" = 1'-0"

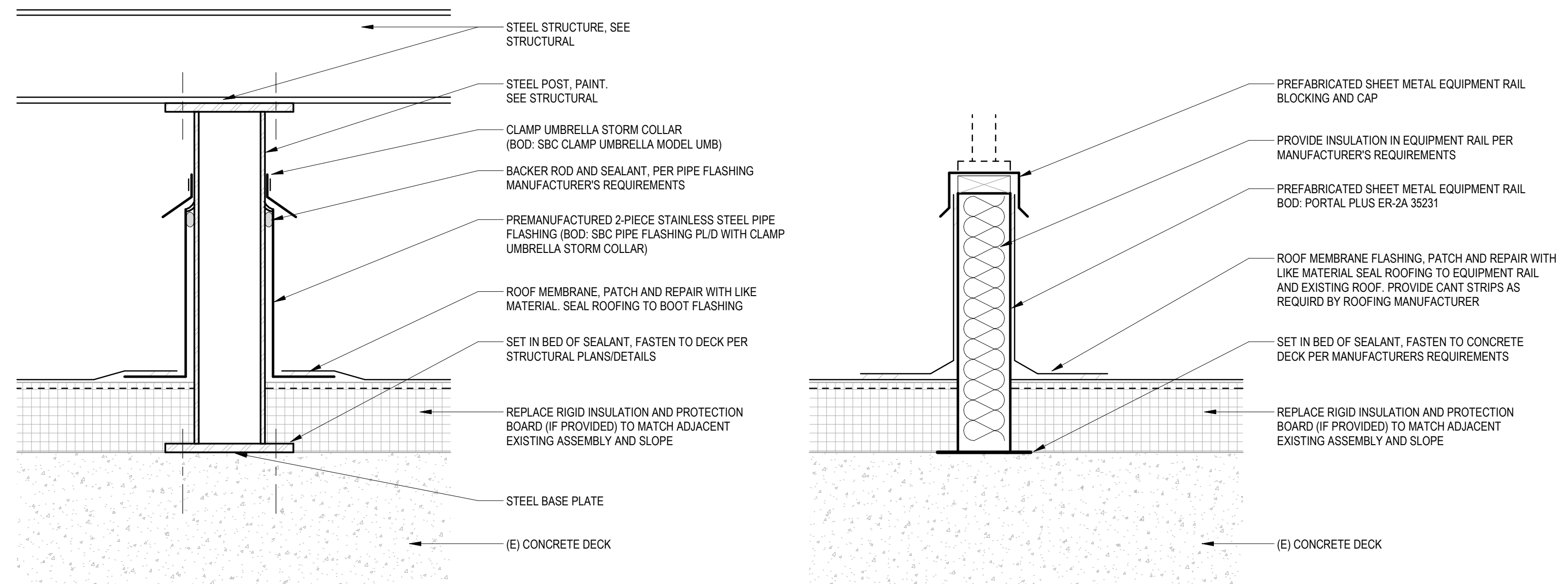


NOTES:

1. EXTEND TO EXISTING NON-POTABLE WATER PIPING DOWNSTREAM OF REDUCED PRESSURE BACKFLOW PREVENTER FEEDING REMOTE SUMP. SEE FLOOR PLAN.
2. BACKWASH (3/4" ID TUBING), TERMINATE AT EXISTING FLOOR DRAIN, PIPE INDIRECT.
3. BRINE TANK OVERFLOW (1/2" ID TUBING) TERMINATE AT EXISTING FLOOR DRAIN, PIPE INDIRECT. DO NOT CONNECT TO BACKWASH PIPING.
4. TO ADIABATIC FLUID COOLER. SEE FLOOR PLAN.
5. ANCHOR DUPLEX BOOSTER PUMP TO 4" CONCRETE HOUSEKEEPING PAD.
6. PRESSURE GAUGE (0-100 PSIG)

**2 BOOSTER PUMP AND WATER SOFTENER PIPING DETAIL**

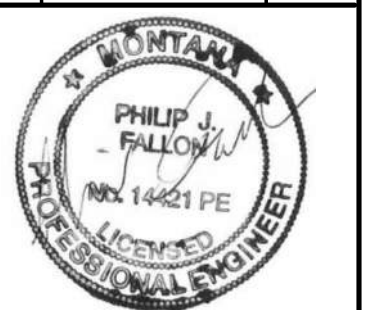
SCALE: 12" = 1'-0"



**4 ROOFING DETAILS**

SCALE: 1 1/2" = 1'-0"

REV.	DESCRIPTION	DATE



PPA#18-2194

MCKINSTRY#207626

**SHEET TITLE**  
MECHANICAL  
DETAILS

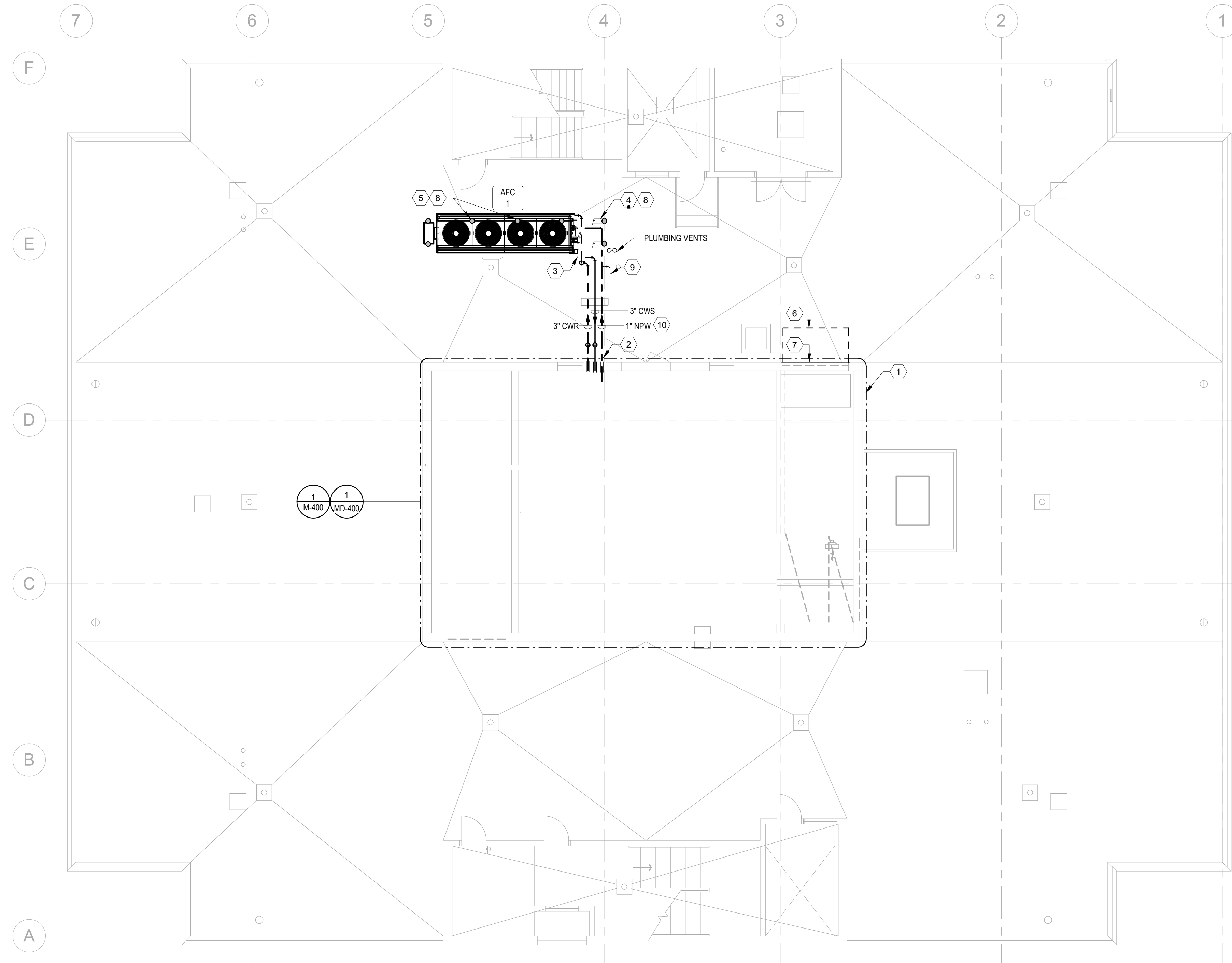
**SHEET**

**M-061**

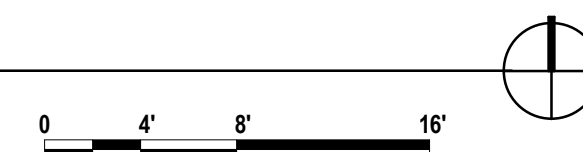
**DATE**

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**1 ROOF PIPING PLAN**  
SCALE: 1/8" = 1'-0"



**KEYNOTES**

- 1 SEE ENLARGED PENTHOUSE PLAN FOR WORK IN THIS AREA.
- 2 OFFSET PIPING BEYOND MISCELLANEOUS INSTRUMENTATION ON EXTERIOR WALL.
- 3 INSTALL PIPE PER DETAIL 3, SHEET M-061.
- 4 COOLER TO SET AT TOP STRUCTURAL BEAM WHICH SPANS BETWEEN COLUMNS '3' & '4' ALONG THE ENTIRE LENGTH OF COLUMN 'E'. NOTE TOP OF BEAM APPROX. 12 INCHES ABOVE FINISHED ROOF. SEE STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
- 5 STRUCTURAL POST UP, TYPICAL OF 7 LOCATIONS, SEE STRUCTURAL.
- 6 REMOVE INTAKE HOOD (APPROXIMATELY 96"W x 64"H x 42"D IN ITS ENTIRETY).
- 7 PROVIDE 20 GAUGE INSULATED COVER OVER BOTH LOUVERED OPENINGS AND SEAL WATER TIGHT. PROVIDE DRIP EDGE ALONG TOP. APPROXIMATE TOTAL SHEETMETAL COVER DIMENSIONS = 96"W x 128"H (FIELD VERIFY). PREP AND PAINT SHEETMETAL COVER TO MATCH ADJACENT FINISH. INSULATION SHALL BE 1" UNFACED POLY-ISOCYANURATE OR EQUAL.
- 8 FLASH AROUND STRUCTURAL POST-UPS PER DETAIL 4, SHEET M-061.
- 9 SLOPE NON-POTABLE DOMESTIC WATER BACK TOWARDS 3-WAY AUTOMATIC DRAIN VALVE LOCATED IN MECHANICAL PENTHOUSE.
- 10 PROVIDE HEAT TRACING ON EXTERIOR NPW PIPING.



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**MSU - COBLEIGH HALL**  
COLD CHAMBERS COOLING TOWER  
REPLACEMENT

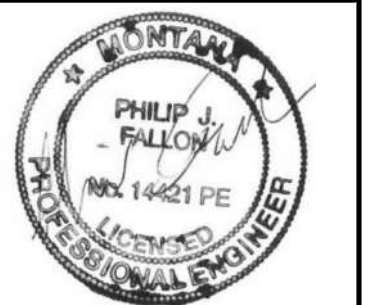
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REVIEWED BY: P. FALLON

REV.	DESCRIPTION	DATE



**PPA#18-2194**

**MCKINSTRY#207626**

**SHEET TITLE**  
MECHANICAL - ROOF  
PLAN

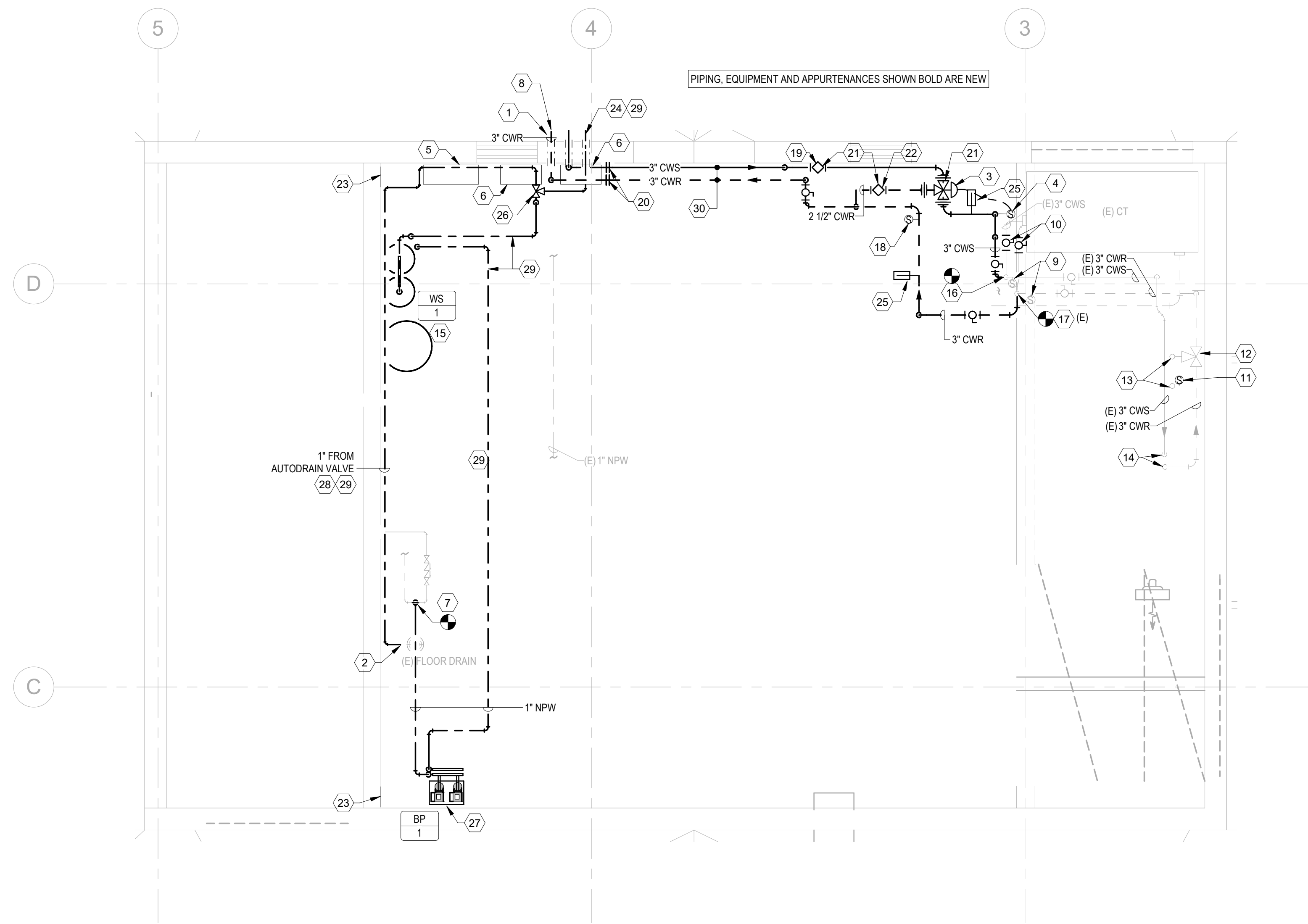
**SHEET**

**MP101**

**DATE**  
01-04-2024

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**1 MECHANICAL - ENLARGED PENTHOUSE PLAN**  
SCALE: 1/4" = 1'-0"

**KEYNOTES**

- 1 CORE DRILL THRU EXTERIOR WALL AND PROVIDE PIPE SLEEVE. SEAL WATERTIGHT AROUND PIPE SLEEVE AND ANNUJAR SPACE BETWEEN PIPING INSULATION AND SLEEVE (TYP.). SEE MP-101 FOR CONTINUATION WALL PENETRATIONS SHALL NOT CUT THE EXISTING REINFORCEMENT THRU THE 8" THICK CONCRETE PENTHOUSE WALL. REINFORCEMENT ACCORDING TO THE ORIGINAL STRUCTURAL DRAWINGS IS #4 REBAR @10" HORIZONTAL AND #4 REBAR @ 16" VERTICAL. CONTRACTOR SHALL X-RAY WALL AS REQUIRED TO AVOID CUTTING REINFORCEMENT.
- 2 TERMINATE 1" DRAIN PIPING WITH AIR-BREAK AT FLOOR DRAIN.
- 3 PROVIDE FULLY MODULATING 3-WAY GLOBE STYLE MIXING VALVE, SIZED FOR 145 GPM @ 5 PSI PD. FOR SUPPLEMENTAL CONTROL OF CONDENSER WATER TEMPERATURE.
- 4 PROVIDE TEMPERATURE WELL AND DDC TEMPERATURE SENSOR.
- 5 JOHNSON CONTROLS COOLING TOWER CONTROLLERS TO REMAIN OPERATIONAL THRU THE CONSTRUCTION PERIOD, UNTIL 90 DAY RUN PERIOD HAS BEEN COMPLETED. SEE PLAN SHEET MD-401.
- 6 AVAILABLE ENCLOSURE FOR ADDITIONAL BAS CONTROLLERS AND OR INPUT OUTPUT MODULES AS NEEDED.
- 7 CONNECT TO EXISTING NON-POTABLE DOMESTIC COLD WATER PIPING DOWNSTREAM OF BACKFLOW PREVENTER AT THIS LOCATION.
- 8 CONDENSER WATER PIPING (CWS/CWR) OUT TO ROOF MOUNTED TOWER. SEE ROOF PLAN FOR CONTINUATION.
- 9 EXISTING BAS TEMPERATURE SENSORS/WELLS TO REMAIN ON CONDENSER WATER SUPPLY AND RETURN PIPING.
- 10 CUT-IN ISOLATION VALVES ON CONDENSER WATER SUPPLY AND RETURN (CWS/CWR) PIPING TO EXISTING EVAPORATIVE COOLER. SEE DETAIL 1 SHEET M-061.
- 11 EXISTING BUILDING AUTOMATION TEMPERATURE SENSOR/WELL ON CONDENSER WATER RETURN PIPING FROM UNIT HEATERS "HEAT RECOVERY" OUTSIDE AIR FLENUMS TO REMAIN.
- 12 EXISTING 2" HEAT RECOVERY 3-WAY VALVE TO REMAIN.
- 13 EXISTING PIPING UP TO HEAT RECOVERY SYSTEM.
- 14 CONDENSER WATER SUPPLY AND RETURN PIPING DOWN TO BUILDING.
- 15 PROVIDE WATER SOFTENER AS SCHEDULED. INSTALL PER DETAIL 2. SHEET M-061.
- 16 CONNECT NEW CWS TO EXISTING CWS VERTICAL PIPE SERVING EVAPORATIVE COOLER. SEE PIPING DETAIL 1 SHEET M-061.
- 17 CONNECT NEW CWR TO EXISTING CWR VERTICAL PIPE SERVING EVAPORATIVE COOLER. SEE PIPING DETAIL 1 SHEET M-061.
- 18 CONDENSER WATER RETURN SENSOR.
- 19 PROVIDE BALANCE VALVE WITH MEMORY STOP. VALVE SHALL BE SET TO FULL OPEN POSITION. TACO ACCU FLO MODEL ACUF-300-F 3" FLANGED.
- 20 TRANSITION FROM SCHEDULE 80 PVC PRESSURE PIPING (INTERIOR PIPING) TO SCHEDULE 40 STEEL PIPE (EXTERIOR PIPING) AT THIS LOCATION.
- 21 BYPASS PIPING, ISOLATION AND BALANCE VALVE SHALL BE INSTALLED IN READILY ACCESSIBLE LOCATION, APPROX 9' A.F.F.
- 22 PROVIDE BALANCE VALVE WITH MEMORY STOP. SET FOR EQUAL FLOW AT FULL BY-PASS AS THRU TOWER WITH FULL FLOW TO COOLER. TACO ACCU FLO MODEL ACUF-300-F 3" FLANGED.
- 23 MAINTAIN CLEARANCE AT ACCESS DOOR.
- 24 NON-POTABLE SOFTENED DOMESTIC WATER OUT TO ROOF MOUNTED ADIABATIC. SEE MECHANICAL ROOF PLAN MP-101 FOR CONTINUATION.
- 25 PROVIDE THERMOMETER IN CONDENSER WATER PIPING AT THIS LOCATION.
- 26 3-WAY AUTOMATIC DRAIN DOWN VALVE, MOUNT APPROX. 12" A.F.F. FIELD VERIFY ELEVATIONS FOR PROPER DRAINAGE OF EXTERIOR AND INTERIOR NON-POTABLE DOMESTIC WATER.
- 27 PROVIDE DUPLEX BOOSTER PUMP SKID AS SCHEDULED. ANCHOR TO 4" HOUSEKEEPING PAD, PIPE PER DETAIL 2. SHEET M-061.
- 28 SLOPE PIPING AT 1/8" PER FOOT FROM AUTODRAIN VALVE TOWARDS FLOOR DRAIN.
- 29 NPW PIPING SHALL BE TYPE 1" COPPER WITH SOLDERED JOINTS.
- 30 PROVIDE MANUAL AIR VENTS AT HIGH POINT IN CONDENSER PIPING. AIR VENTS SHALL BE 3/8" BALL VALVE WITH 18" LONG SOFT COPPER "CANDY CANE" SOFT COPPER AT OUTLET.

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**MSU - COBLEIGH HALL**  
COLD CHAMBERS COOLING TOWER  
REPLACEMENT

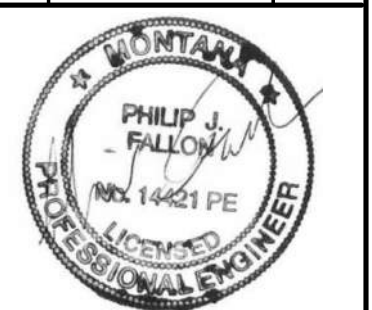


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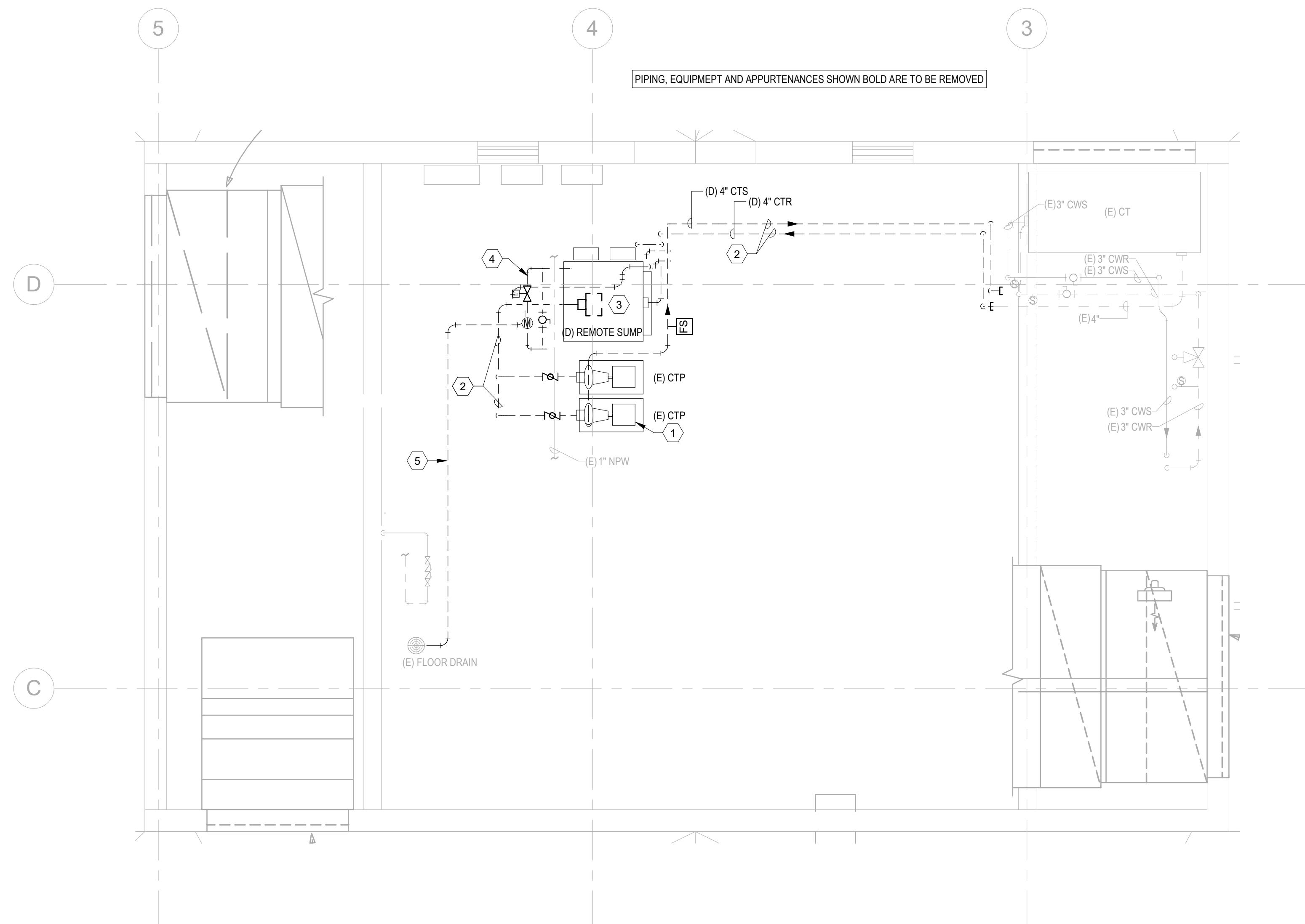
**MCKINSTRY#207626**

**SHEET TITLE**  
ENLARGED  
PENTHOUSE PLAN

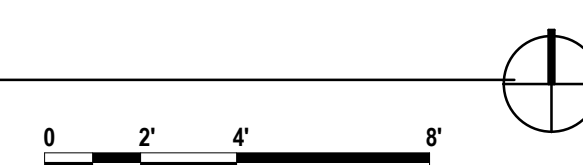
**SHEET**

**M-400**

**DATE**  
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**1 MECHANICAL - ENLARGED PENTHOUSE DEMOLITION PLAN**  
SCALE: 1/4" = 1'-0"



**KEYNOTES**

- 1 FOLLOWING 90 DAY RUN PERIOD OF NEW CONDENSER WATER COOLER, REMOVE SPRAY TREE PUMP AND CONCRETE ISOLATION BASE.
- 2 FOLLOWING 90 DAY RUN PERIOD OF NEW CONDENSER WATER COOLER, REMOVE SPRAY TREE PIPING AND CAP WHERE INDICATED.
- 3 FOLLOWING 90 DAY RUN PERIOD OF NEW CONDENSER WATER COOLER, REMOVE REMOTE SUMP AND ASSOCIATED CHEMICAL TREATMENT PIPING AND CONTROLS. TURN OVER CONTROLLER TO MSU.
- 4 FOLLOWING 90 RUN PERIOD, REMOVE 1" NON-POTABLE WATER PIPING DROP TO WATER METER AND BYPASS SERVING REMOTE SUMP AND CAP PIPING AT MAIN OVERHEAD.
- 5 FOLLOWING 90 RUN PERIOD, REMOVE BLOWDOWN AND SUMP OVERFLOW PIPING BETWEEN REMOTE SUMP/PUMP SUCTION HEADER AND FLOOR DRAIN.



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COLD CHAMBERS COOLING TOWER  
REPLACEMENT

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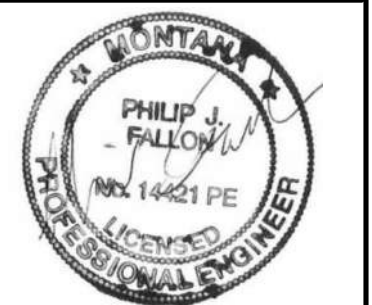


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**SHEET TITLE**  
ENLARGED  
PENTHOUSE  
DEMOLITION PLAN

**SHEET**

**MD-400**

**DATE**  
01-04-2024

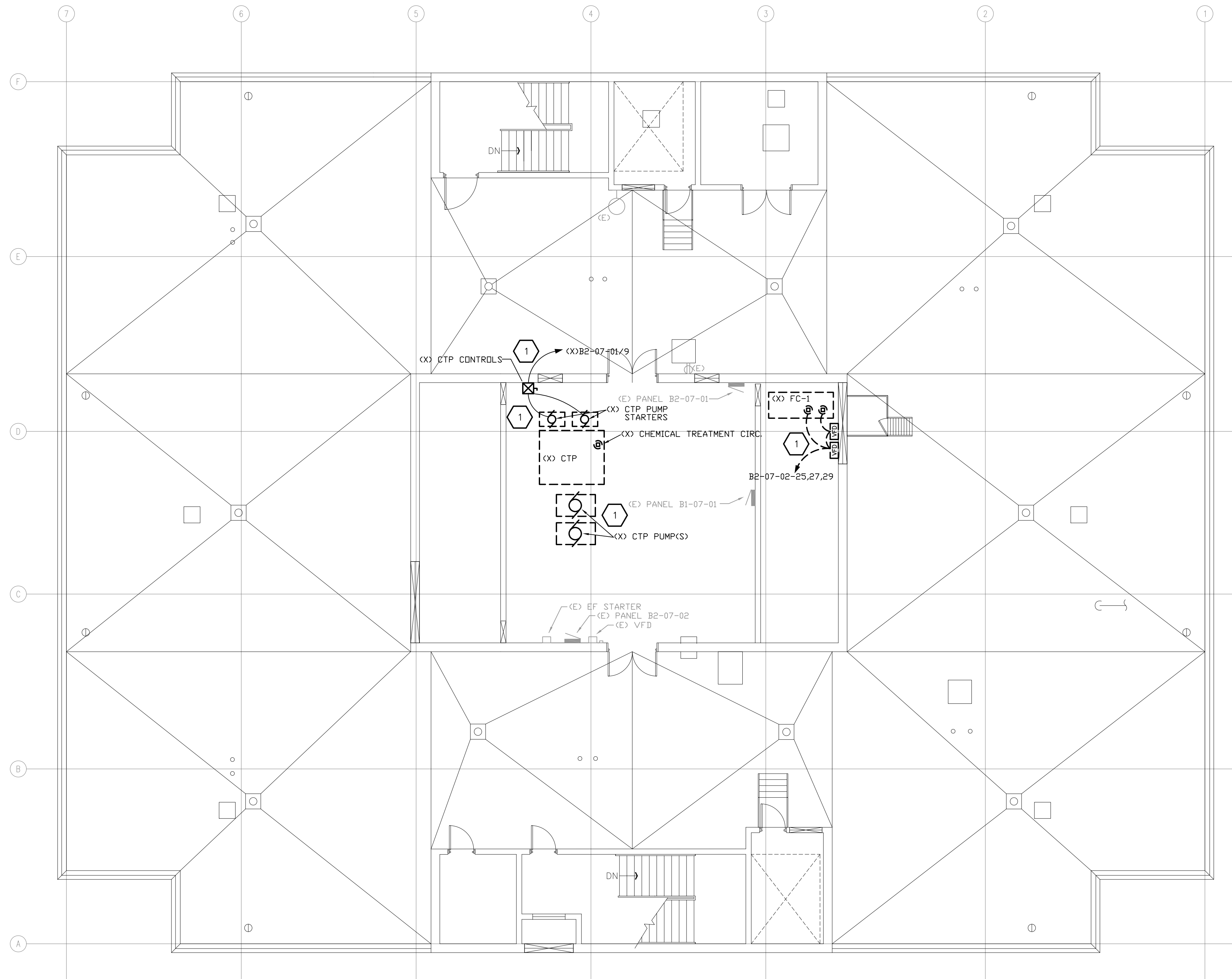
IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INCLUDING EQUIPMENT SUPPLIERS TO COORDINATE WITH EACH OTHER AND TO VERIFY THAT THERE ARE NO CONFLICTS IN LOCATIONS OF DUCTS, CONDUITS, PIPING, DIFFUSERS, ELECTRICAL BOXES AND OTHER ITEMS THROUGHOUT THIS PROJECT, BEFORE FINAL PLACEMENT OF MATERIALS.

GENERAL NOTES

- IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INCLUDING EQUIPMENT SUPPLIERS TO COORDINATE WITH EACH OTHER AND TO VERIFY THAT THERE ARE NO CONFLICTS IN LOCATIONS OF DUCTS, CONDUITS, PIPING, DIFFUSERS, ELECTRICAL BOXES AND OTHER ITEMS THROUGHOUT THIS PROJECT, BEFORE FINAL PLACEMENT OF MATERIALS.
- REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION: DETAILED EQUIPMENT REQUIREMENTS, INSTALLATION INSTRUCTIONS, PERFORMANCE REQUIREMENTS, CONTROL SEQUENCES AND ALL OTHER PROJECT DETAILS.
- EXISTING CONDUITS STUBBED THROUGH THE FLOOR THAT ARE NOT REUSED OR ARE ABANDONED SHALL BE CUT AT THE FLOOR SURFACE, GROUND FLUSH AND FILLED WITH GROUT. FLOOR FINISH SHALL MATCH THAT OF EXISTING.
- ELECTRICAL WORK IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. PATCHING AND PAINTING IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH NEC, STATE AND LOCAL BUILDING CODE.
- RETURN ANY USABLE/ SALVAGEABLE ELECTRICAL DEVICES TO OWNER INCLUDING BUT NOT LIMITED TO: LIGHT FIXTURES, ELECTRICAL HEATERS, PANELS, CIRCUIT BREAKERS ETC. CONFIRM WITH OWNER ITEMS THAT ARE DESIRABLE FOR RETENTION.
- ALL DASHED ITEMS ON DEMOLITION PLANS ARE TO BE REMOVED UNLESS NOTED OTHERWISE. SOLID ITEMS ARE TO REMAIN. NOTE - ITEMS SHOWN IN THE DEMOLITION PLANS ARE BASED ON "EXISTING AS-BUILTS". ADDITIONAL ELECTRICAL ITEMS MAY BE ENCOUNTERED THAT ARE NOT SHOWN - ALL GENERAL ELECTRICAL ITEMS IN THE AREA OF REMODEL ARE TO BE REMOVED THAT ARE NOT SHOWN. REFER TO ABBREVIATIONS FOR DETAILED DESCRIPTION OF DEMOLITION TAGS.

CONSTRUCTION NOTES

- EXISTING COOLING TOWER AND ASSOCIATED EQUIPMENT TO REMAIN OPERATIONAL THRU THE CONSTRUCTION PERIOD, AFTER 90 DAY RUN PERIOD HAS BEEN COMPLETED THE COOLING TOWER AND ASSOCIATED EQUIPMENT IS TO BE REMOVED IN ITS ENTIRETY.



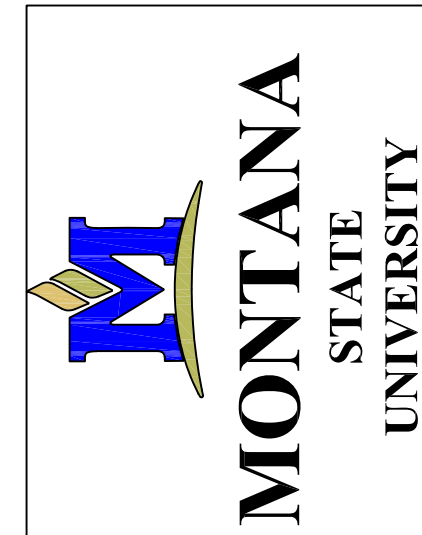
(E) PANEL B2-07-02

225 AMPS MCB 480Y/277V VOLT 3 PHASE 4 WIRE SURFACE MOUNTING		CIRCUIT		PHASE LOADS			CIRCUIT		BREAKER		
BREAKER	DESCRIPTION	VA	#	A	B	C	#	VA	AMPS	POLES	
20	3 EXHAUST FAN #2	1	0	0	0	0	2	EXHAUST FANS 23.31,35,42	20	3	
-	-	5	0	0	0	0	4	-	-	-	
-	-	6	0	0	0	0	6	-	-	-	
20	3 EXHAUST FAN 36&5	7	0	0	0	0	8	EXHAUST FANS 14,30,36,41	20	3	
-	-	9	0	0	0	0	10	-	-	-	
-	-	11	0	0	0	0	12	-	-	-	
20	3 H&V #2	13	0	0	0	0	14	EXHAUST FANS 13,19,27,40	20	3	
-	-	15	0	0	0	0	16	-	-	-	
-	-	17	0	0	0	0	18	-	-	-	
20	3 EXHAUST FAN 28,12,20,38	19	0	0	0	0	20	COOLING TOWER FAN	30	3	
-	-	21	0	0	0	0	22	-	-	-	
-	-	23	0	0	0	0	24	-	-	-	
30	3 (X) FC-1	25	0	0	0	0	26	SPARE	70	3	
-	-	27	0	0	0	0	28	-	-	-	
-	-	29	0	0	0	0	30	-	-	-	
-	PROVISION	31	0	0	0	0	32	SOUTH ELEVATOR	100	3	
20	1 HEAT TAPE	33	0	0	0	0	34	-	-	-	
-	PROVISION	35	0	0	0	0	36	-	-	-	
-	PROVISION	37	0	0	0	0	38	PROVISION	-	-	
-	PROVISION	39	0	0	0	0	40	PROVISION	-	-	
-	PROVISION	41	0	0	0	0	42	PROVISION	-	-	
TOTAL LOADS:		0 VA		0 A		0 A		0 VA		0 AMPS	
DEMAND:		0 VA		0 A		0 A		0 VA		0 AMPS	

(E) PANEL B1-07-01

100 AMPS MLO 208Y/120V VOLT 3 PHASE 4 WIRE SURFACE MOUNTING		CIRCUIT		PHASE LOADS			CIRCUIT		BREAKER		
BREAKER	DESCRIPTION	VA	#	A	B	C	#	VA	AMPS	POLES	
30	1 FANS 43, 44, 45, 46	1	0	0	0	0	2	ELEV RM LIGHTS, CAB HEATER	20	1	
20	1 (X) PUMPS FOR COOL TOWER	3	0	0	0	0	4	ISO ELEV RM EX FANS	20	1	
30	1 FANS 6, 37	5	0	0	0	0	6	SW STAIR SECTION	20	1	
20	1 S. PENTHOUSE CAB. HEAT	7	0	0	0	0	8	FL DYE PANEL/ JU PANEL	20	1	
50	2 WELDING RCPT	9	0	0	0	0	10	PENTHOUSE LIGHTS	20	1	
-	-	11	0	0	0	0	12	BOOSTER PUMP W/O TRG	20	1	
20	1 CONTROL POWER PUMP C-1	13	0	0	0	0	14	PENTHOUSE RCPT, SHAFT LIGHT	20	1	
20	1 CHILLER "TRACKSET" PAN	15	0	0	0	0	16	JCT TEMP CONTROL PANELS	20	1	
20	1 RCPT LITS NO. PENTHOUSE	17	0	0	0	0	18	FAN 48	20	1	
TOTAL LOADS:		0 VA		0 A		0 A		0 VA		0 AMPS	
DEMAND:		0 VA		0 A		0 A		0 VA		0 AMPS	

ROOF PLAN - POWER DEMO  
SCALE: 1/8" = 1'-0"



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MSU - COBLEIGH HALL  
COLD CAMBERS COOLING TOWER  
REPLACEMENT

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SHEET TITLE  
ROOF PLAN -  
POWER DEMO

SHEET

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DATE  
01-04-24



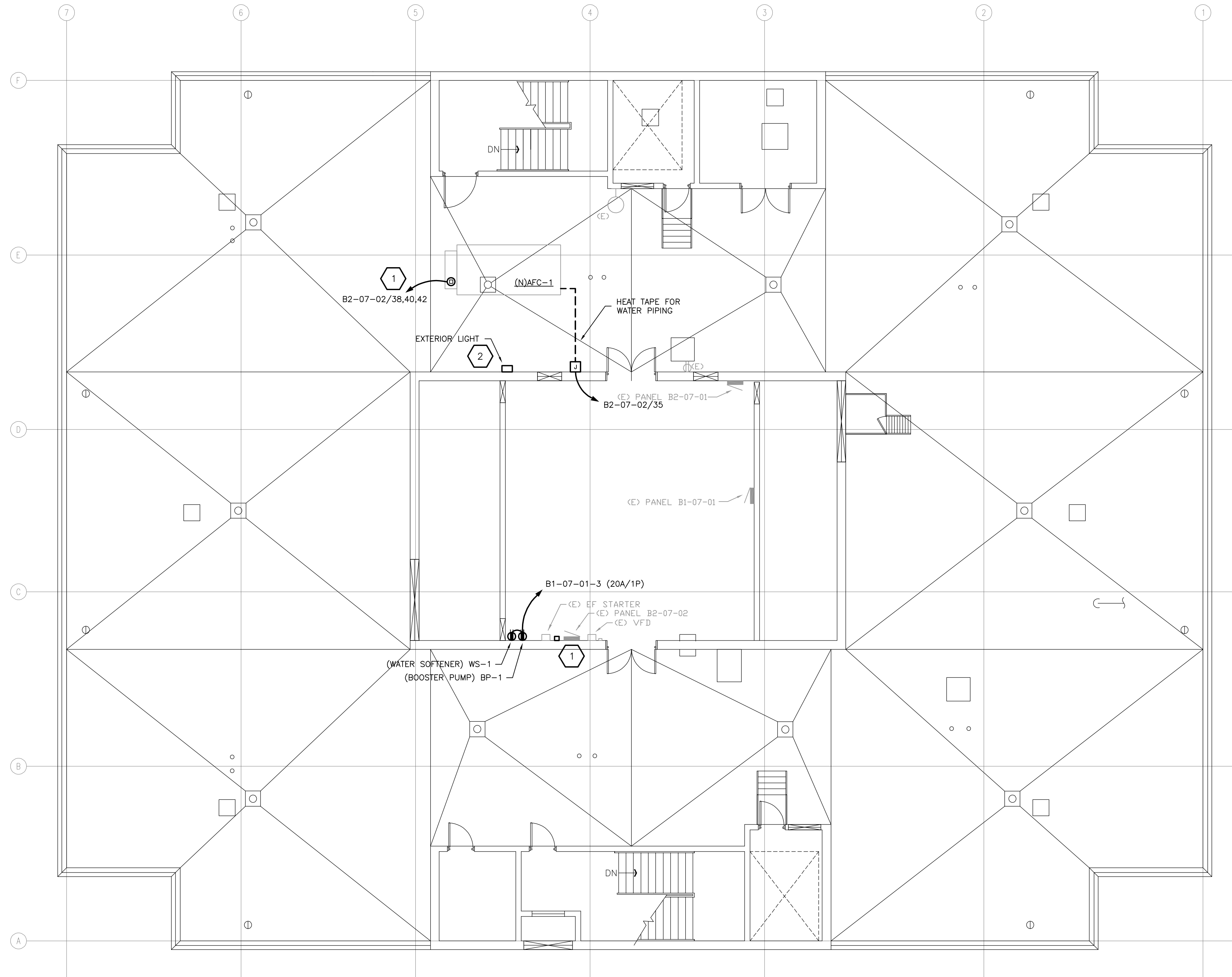
IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INCLUDING EQUIPMENT SUPPLIERS TO COORDINATE WITH EACH OTHER AND TO VERIFY THAT THERE ARE NO CONFLICTS IN LOCATIONS OF DUCTS, CONDUITS, SPRINKLER HEADS, SPRINKLER PIPING, DIFFUSERS, ELECTRICAL BOXES AND OTHER ITEMS THROUGHOUT THIS PROJECT, BEFORE FINAL PLACEMENT OF MATERIALS.

GENERAL NOTES

- IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INCLUDING EQUIPMENT SUPPLIERS TO COORDINATE WITH EACH OTHER AND TO VERIFY THAT THERE ARE NO CONFLICTS IN LOCATIONS OF DUCTS, CONDUITS, SPRINKLER HEADS, SPRINKLER PIPING, DIFFUSERS, ELECTRICAL BOXES AND OTHER ITEMS THROUGHOUT THIS PROJECT, BEFORE FINAL PLACEMENT OF MATERIALS.
- REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION: DETAILED EQUIPMENT REQUIREMENTS, INSTALLATION INSTRUCTIONS, PERFORMANCE REQUIREMENTS, CONTROL SEQUENCES AND ALL OTHER PROJECT DETAILS.
- INSTALL ALL NEW WORK TO MEET CURRENT CODES AND INSTALLATION STANDARDS.
- NEW CONDUCTORS SHALL BE COPPER AND A MINIMUM OF #12 GAUGE.
- LIGHT FIXTURES SHOWN WITH A HEIGHT CALLOUT (XX") SHALL BE INSTALLED AS DESCRIBED HERE. THE HEIGHT CALLOUT SHALL BE THE DISTANCE FROM FINISHED FLOOR/GRADE TO THE BOTTOM OF THE RESPECTIVE LIGHT FIXTURE.
- EMERGENCY BATTERY BALLASTS, AND EXIT SIGNS SHALL BE PROVIDED WITH AN UN-SWITCHED HOT CONDUCTOR FROM THE SAME CIRCUIT AS THE RESPECTIVE SWITCH-LEG.
- 0-10V DIMMING CABLE IS NOT SHOWN ON THE PLANS. PROVIDE CABLING BETWEEN 0-10V DIMMER(S) AND THE THEIR RESPECTIVE DIMMING BALLAST WHICH THEY CONTROL PER THE DIMMER MANUFACTURER'S REQUIREMENTS.
- CIRCUITRY SHOWN IN SOLID LINETYPE SHALL BE NORMAL POWER. THE CIRCUITRY SHOWN IN A DASHED LINETYPE SHALL BE LOW-VOLTAGE CABLING FOR THE LIGHTING CONTROLS. PROVIDE AND INSTALL PER THE MANUFACTURER'S REQUIREMENTS.
- INSTALL AND PROGRAM LIGHTING CONTROLS PER THE LIGHTING CONTROL INTENT. ROOM CONTROLLERS ARE TO BE INSTALLED ABOVE ACCESSIBLE CEILINGS.
- LOW-VOLTAGE SWITCHES AND LIGHTING CONTROL DEVICES SHALL BE PROGRAMMED TO CONTROL THE LIGHTS WITHIN THE RESPECTIVE SPACE PER THE LETTER DESIGNATIONS SHOWN.

CONSTRUCTION NOTES

- PROVIDE A NEW GE (25A/3P) 'TED136025' BREAKER AND MOUNTING HARDWARE WITHIN THE EXISTING GE 'NHB' PANELBOARD TO FEED THE NEW 'AFC-1' ADIABATIC DRY COOLER. PROVIDE A PLACARD AT THE PANEL TO INFORM USERS TO KEEP THE EXISTING COOLING TOWER BREAKER OFF UNLESS NEEDED.
- PROVIDE A GARDCO '121-16L-530-WW-3-UNV-DD-PCB-F1-BK' EXTERIOR WALL MOUNT LIGHT FIXTURE MOUNTED 12'-0" ABOVE THE ROOF LEVEL. LIGHT TO BE FED FROM THE CIRCUIT NOTED AND CONTROLLED BY AN LIGHT SWITCH AT THE SERVICE PLATFORM ACCESS LADDER IN A WEATHER PROOF BOX.



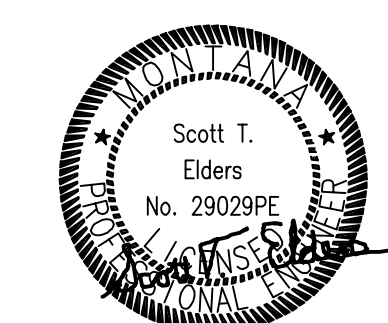
(R) PANEL B2-07-02

225 AMPS, MCB 480Y/277V VOLT 3 PHASE 4 WIRE SURFACE MOUNTING		CIRCUIT		PHASE LOADS			CIRCUIT		DESCRIPTION		BREAKER	
BREAKER	DESCRIPTION	VA	#	A	B	C	#	VA			AMPS/POLES	
20 3	EXHAUST FAN #2	1	0	0	0	0	2	0	EXHAUST FANS 23,31,35,42	20	3	
-	-	3	0	0	0	0	4	0	-	-	-	
-	-	5	0	0	0	0	6	0	-	-	-	
20 3	EXHAUST FAN 39&5	7	0	0	0	0	8	0	EXHAUST FANS 14,30,36,41	20	3	
-	-	9	0	0	0	0	10	0	-	-	-	
-	-	11	0	0	0	0	12	0	-	-	-	
20 3	H&V #2	13	0	0	0	0	14	0	EXHAUST FANS 13,19,27,40	20	3	
-	-	15	0	0	0	0	16	0	-	-	-	
-	-	17	0	0	0	0	18	0	-	-	-	
20 3	EXHAUST FAN 28,12,20,38	19	0	0	0	0	20	0	COOLING TOWER FAN	30	3	
-	-	21	0	0	0	0	22	0	-	-	-	
-	-	23	0	0	0	0	24	0	-	-	-	
30 3	SPARE	25	0	0	0	0	26	0	SPARE	70	3	
-	-	27	0	0	0	0	28	0	-	-	-	
-	-	29	0	0	0	0	30	0	-	-	-	
-	PROVISION	31	0	0	0	0	32	0	SOUTH ELEVATOR	100	3	
20 1	HEAT TAPE	33	0	0	0	0	34	0	-	-	-	
20 1	(W) HEAT TAPE (30mA GFCI)	35	0	0	0	0	36	0	-	-	-	
-	PROVISION	37	5986	0	0	0	38	5986	(N)AFC-1	25	3	
-	PROVISION	39	0	5986	0	0	40	5986	-	-	-	
-	PROVISION	41	0	0	5986	0	42	5986	-	-	-	
TOTAL LOADS:		17958 VA										
DEMAND:		50 AMPS										

(R) PANEL B1-07-01

150 AMPS, MLO 208Y/120V VOLT 3 PHASE 4 WIRE SURFACE MOUNTING		CIRCUIT		PHASE LOADS			CIRCUIT		DESCRIPTION		BREAKER	
BREAKER	DESCRIPTION	VA	#	A	B	C	#	VA			AMPS/POLES	
30 1	FANS 43, 44, 45, 46	1	0	0	0	0	2	0	ELEV RM LIGHTS, CAB HEATER	20	1	
20 1	(R) WATER SOFTENER & BOOSTER PUMP	1200	3	1200	0	0	4	0	SO ELEV RM EXFANS	20	1	
30 1	FANS 6, 8, 37	5	0	0	0	0	6	0	SW STAIR SECTION	20	1	
20 1	S. PENTHOUSE CAB. HEAT	7	0	0	0	0	8	0	FL DYE PANEL/JU PANEL	20	1	
50 2	WELDING RCPT	9	0	0	0	0	10	0	PENTHOUSE LIGHTS	20	1	
-	-	11	0	0	0	0	12	0	BOOSTER PUMP W/O H2O	20	1	
20 1	CONTROL POWER PUMP C-1	13	0	0	0	0	14	0	PENTHOUSE RCPT, SHAFT LIGHT	20	1	
20 1	CHILLER TRACKSET PAN	15	0	0	0	0	16	0	JCT TEMP CONTROL PANELS	20	1	
20 1	RCPT LITS ND. PENTHOUSE	17	0	1200	0	0	18	0	FAN 48	20	1	
TOTAL LOADS:		1200 VA										
DEMAND:		3 AMPS										

ROOF PLAN - POWER REMODEL  
SCALE: 1/8" = 1'-0"



MSU-CPDC  
MONTANA STATE UNIVERSITY  
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PHONE: 406.994.5413  
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MSU - COBLEIGH HALL  
COLD CAMBERS COOLING TOWER  
REPLACEMENT

01/04/2024 - 100% CONSTRUCTION DOCUMENTS



228 W. MAIN, SUITE C  
MISSOULA, MT 59802  
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www.mckinstry.com

DRAWN BY: SE  
REVIEWED BY: SE  
REV. DESCRIPTION DATE



PPA#18-2194

SHEET TITLE  
ROOF PLAN -  
POWER REMODEL

SHEET

E1.1

DATE  
01-04-24

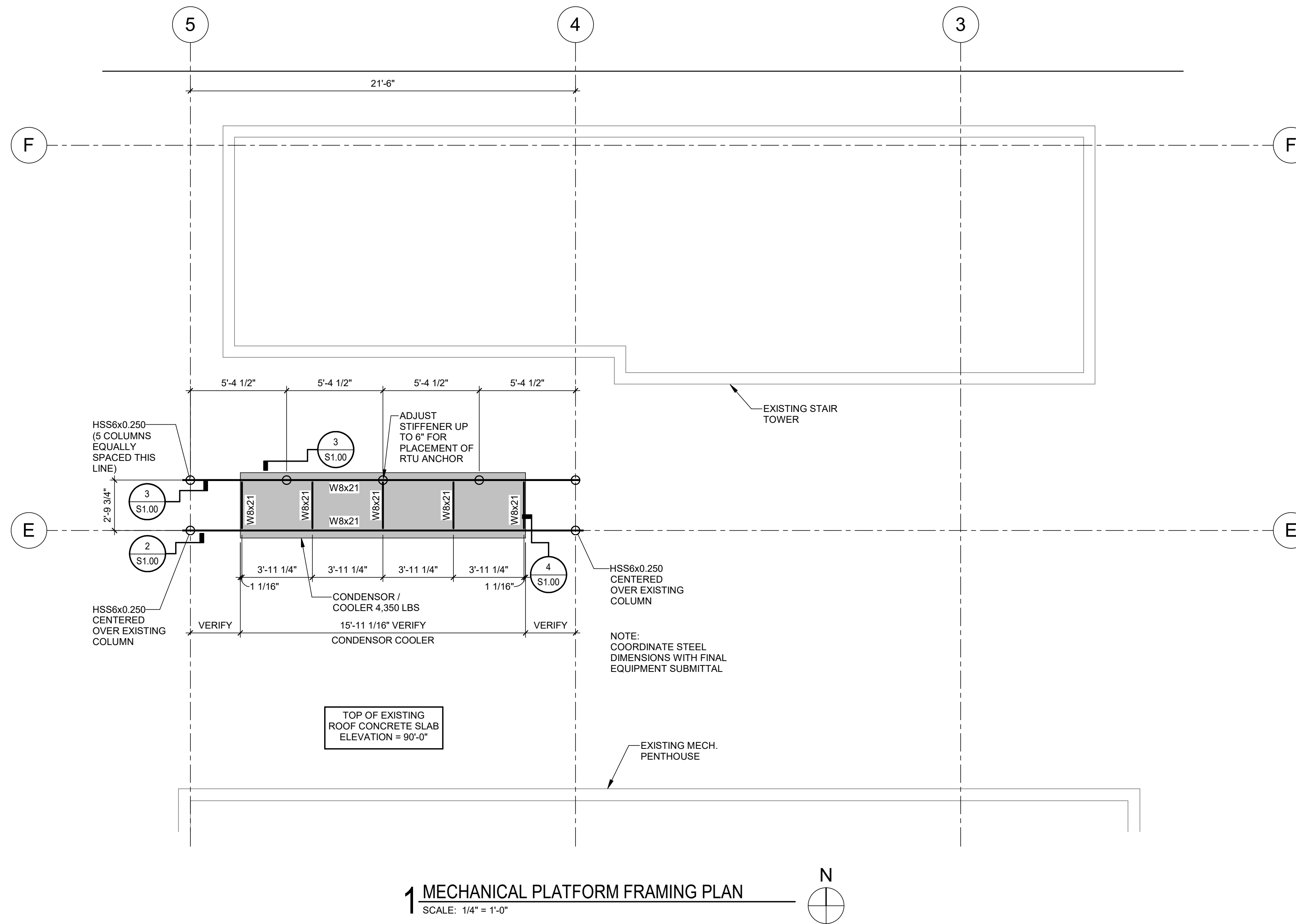
# STRUCTURAL SPECIFICATIONS

## DESIGN LOADING CRITERIA

- A. APPLICABLE BUILDING CODES:
- 2021 INTERNATIONAL BUILDING CODE (IBC); REFERENCED IN DRAWINGS AS "ADOPTED BUILDING CODE"
  - ASCE 7-16 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES
- B. RISK CATEGORY: III
- C. DEAD LOADS: SELF WEIGHT OF THE STRUCTURE PLUS A MAXIMUM COLLATERAL/AUXILIARY LOADS OF:
- SPRINKLERS = 1.0 PSF
  - MECHANICAL DUCTS = 1.5 PSF
  - ELECTRICAL CONDUIT = 1.0 PSF
- D. LIVE LOADS
- ROOF LIVE LOADS
    - CONSTRUCTION = 20 PSF (REDUCIBLE)
- E. SNOW LOAD DATA
- SNOW IMPORTANCE FACTOR,  $I_s = 1.10$
  - THERMAL FACTOR,  $C_t = 1.0$
  - SNOW EXPOSURE FACTOR,  $C_e = 0.9$
  - GROUND SNOW LOAD,  $P_g = 40$  PSF
  - FLAT ROOF SNOW LOAD:  $P_f = 30$  PSF
  - DRIFTING, SLIDING AND UNBALANCED SNOW LOADS: IN ACCORDANCE WITH ASCE 7.
- F. WIND LOAD DATA
- WIND EXPOSURE CATEGORY = C
  - BASIC DESIGN WIND SPEED:  $V = 114$  MPH, 3 SECOND GUST
  - NOMINAL DESIGN WIND SPEED:  $V_{ref} = 89$  MPH, 3 SECOND GUST
  - APPLICABLE INTERNAL PRESSURE COEFFICIENT:  $GC_p = +/- 0.18$
- G. EARTHQUAKE DESIGN DATA
- SEISMIC IMPORTANCE FACTOR,  $I_e = 1.25$
  - SEISMIC DESIGN CATEGORY = D
  - SITE CLASS = D
  - SPECTRAL RESPONSE ACCELERATION:
    - SHORT PERIOD,  $S_s = 0.679$
    - 1 SECOND PERIOD,  $S_1 = 0.213$
  - DESIGN SPECTRAL RESPONSE ACCELERATION:
    - SHORT PERIOD,  $S_{ps} = 0.569$
    - 1 SECOND PERIOD,  $S_{p1} = 0.309$

## STEEL

- A. GENERAL
- ALL STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH ADOPTED BUILDING CODE CHAPTER FOR "STEEL" AND THE FOLLOWING:
    - AISC 360-16 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.
    - AWS D1.1 STRUCTURAL WELDING CODE STEEL.
  - ALL WELDING SHALL CONFORM TO CURRENT AMERICAN WELDING SOCIETY STANDARDS AND TO BE PERFORMED BY CERTIFIED WELDERS.
- B. STRUCTURAL STEEL SHAPES
- W-SHAPES SHALL BE ASTM A992
  - PLATES, ANGLES, CHANNELS, M-SHAPE, S-SHAPE, MC SHAPE AND BARS SHALL BE ASTM A36.
  - ROUND HSS SHAPES SHALL BE ASTM A500-GRADE B ( $F_y = 46$  ksi) OR GRADE C ( $F_y = 50$  ksi)
- C. WELDING
- WELDING ELECTRODES SHALL BE E70XX, UNLESS NOTED OTHERWISE
  - ALL FILLET WELD SHALL BE PER AISC. MINIMUM SIZES ARE BASED ON THICKNESS OF MATERIALS JOINED, UNLESS NOTED OTHERWISE.
- D. BOLTS AND CONNECTIONS
- BOLTS IN STANDARD STEEL TO STEEL CONNECTIONS SHALL BE ASTM F3125, GRADE A325, TYPE 1. IF WEATHER OR CORROSION RESISTANCE BOLTS ARE REQUIRED, USE ASTM F3125, GRADE A325, TYPE 3 BOLTS.
  - NUTS SHALL BE ASTM A563
  - WASHERS SHALL BE F436. DIRECT-TENSION-INDICATOR WASHERS SHALL BE F959
  - THREADED RODS SHALL BE ASTM A36.
  - TYPICAL BOLT HOLES IN STEEL SHALL BE  $1/16"$  LARGER THAN BOLT DIAMETER, UNLESS NOTED OTHERWISE ON DRAWINGS. BOLT HOLES FOR ANCHOR BOLTS SHALL BE OVERSIZED PER THE AISC.



# SHEET INDEX

SHEET NUMBER	SHEET TITLE	ORIGINAL DATE	REVISION NUMBER	REVISION DATE
S1.00	MECH PLATFORM FRAMING PLAN, NOTES, AND DETAILS	01/04/2024		

## GENERAL NOTES

### GENERAL NOTES:

- G1 THE DIMENSIONS SHOWN HERE APPLY TO STRUCTURAL ELEMENTS ONLY. SEE ARCHITECTURAL PLANS FOR ANY DIMENSIONS NOT SHOWN.
- G2 CONTRACTOR SHALL FIELD VERIFY EXISTING STRUCTURAL CONDITIONS. IF ANY DISCREPANCY OCCURS BETWEEN EXISTING CONDITIONS AND PROPOSED ALTERATIONS, CONTRACTOR SHALL CONTACT ARCHITECT AND STRUCTURAL ENGINEER BEFORE PERFORMING ALTERATION WORK.

### LEGEND:

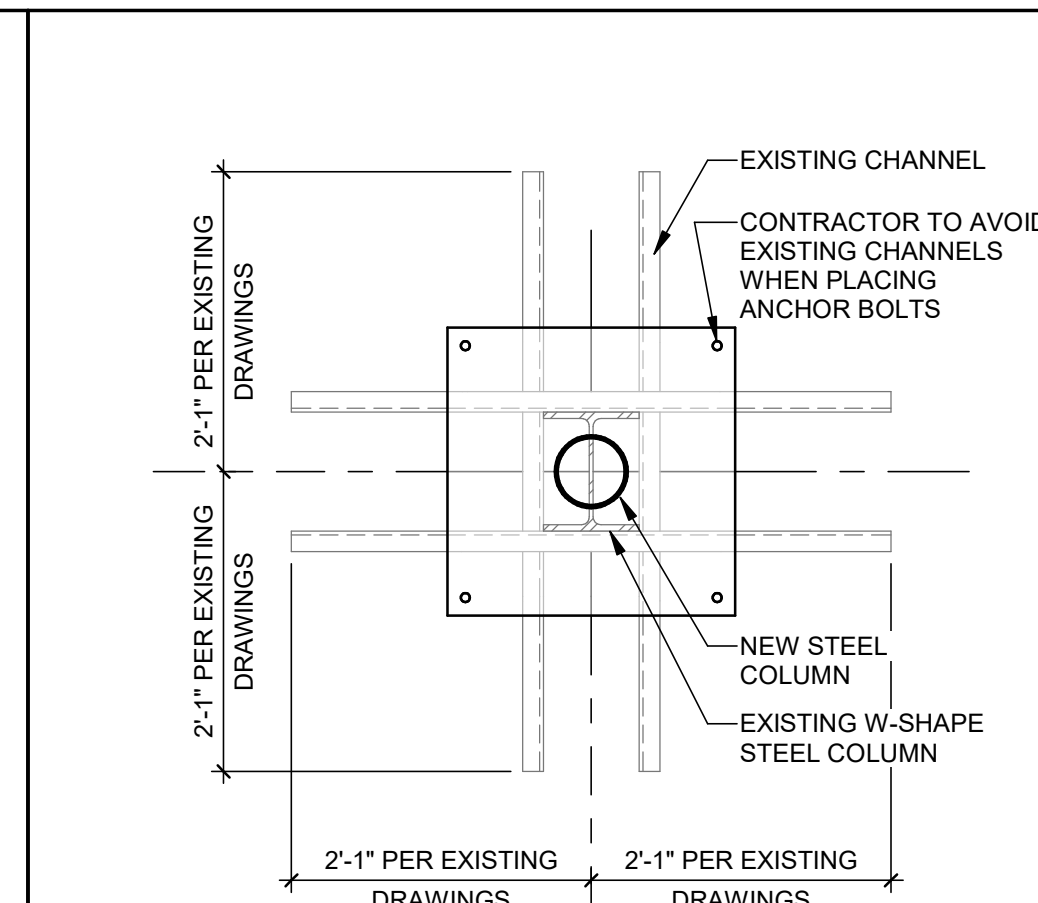
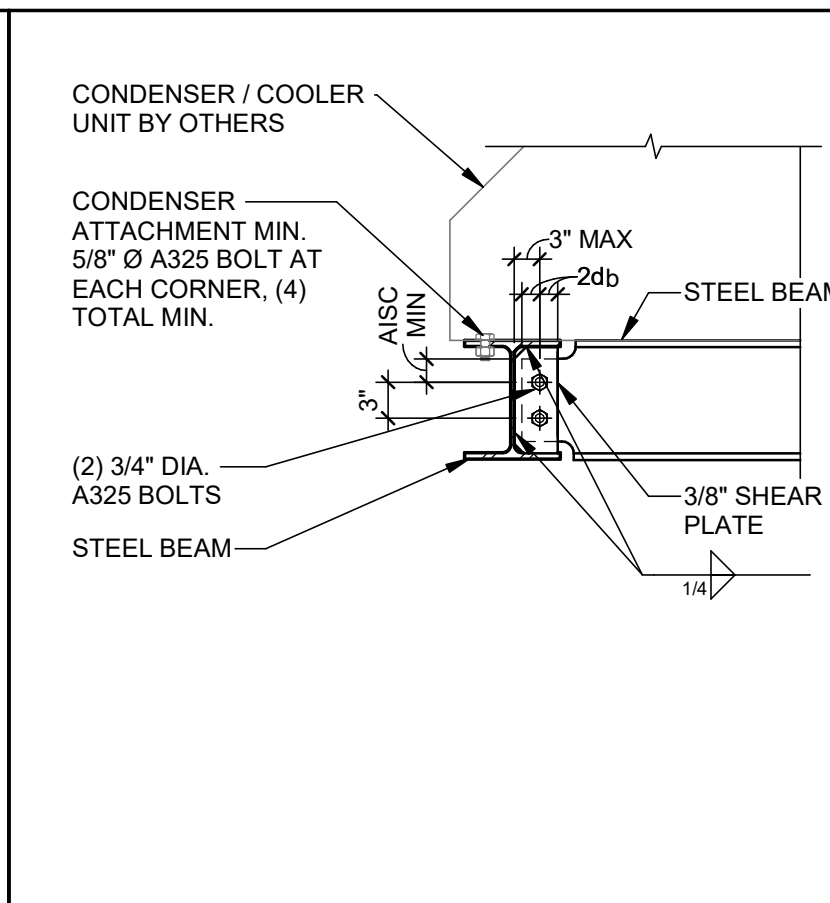
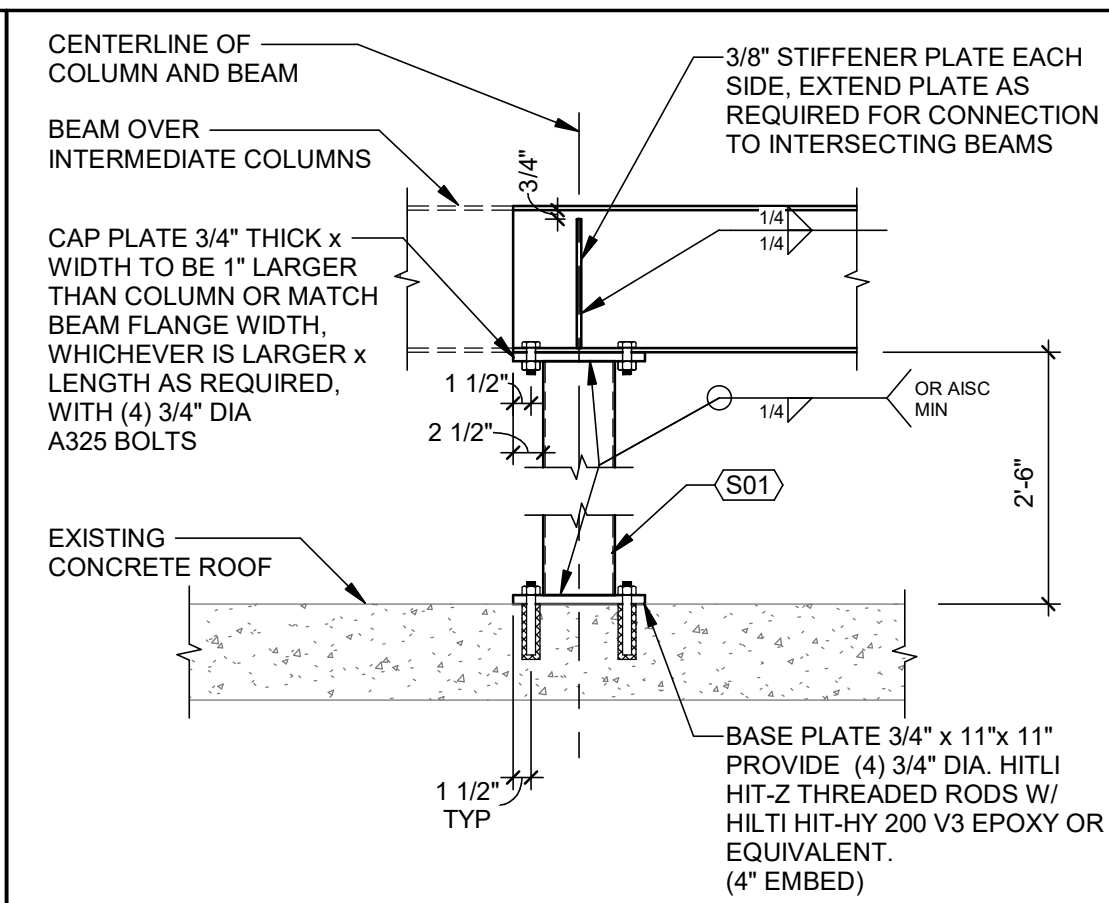
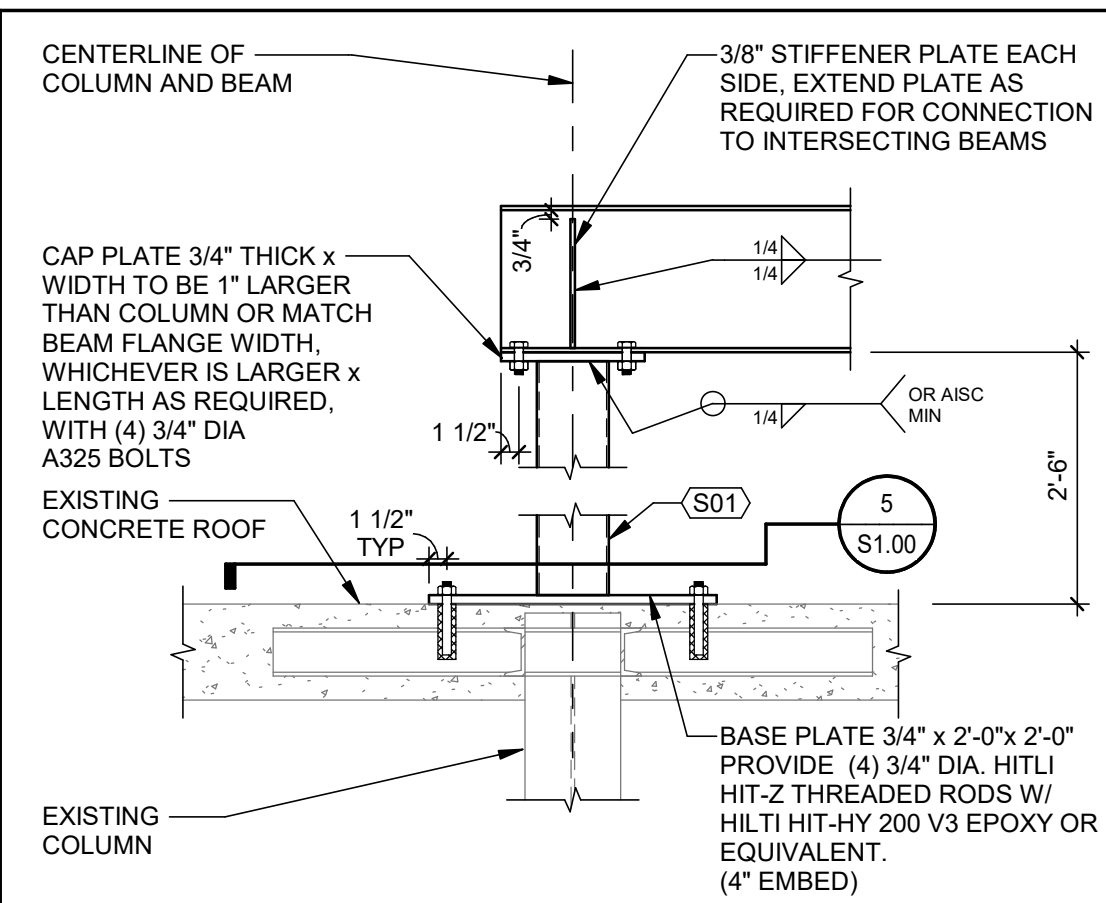
	SECTION REFERENCE		NEW CONSTRUCTION
	ELEVATION REFERENCE		EXISTING CONSTRUCTION OR PROVIDED BY OTHERS
	GENERAL VIEW REFERENCE		ELEMENT BEYOND/OPTIONAL
	REVISION CLOUD AND NUMBER		MASONRY (CMU)
			CONCRETE
			EARTH

## KEYNOTES

S01 STEEL HSS \*

### KEYNOTE SYMBOL LEGEND:

- WA WHERE APPLICABLE
- \* DENOTES ELEMENT SIZE AND INFORMATION IS PROVIDED ON PLAN AND/OR APPLICABLE SCHEDULES.



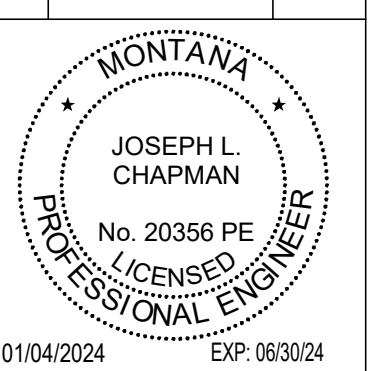
MSU - COBLEIGH HALL  
COLD CAMBERS COOLING TOWER  
REPLACEMENT



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www.mckinstry.com

DRAWN BY: PW  
REVIEWED BY: JC

REV	DESCRIPTION	DATE



PPA#18-2194

SHEET TITLE  
MECH PLATFORM FRAMING PLAN, NOTES, AND DETAILS

SHEET  
S1.00

DATE  
01-04-2024

01/04/2024 - ISSUED FOR CONSTRUCTION