



COVER SHEET

Proposal Submitted By:

Contractor's Name

Contractor's Address

City

State

Zip Code

STATE OF ILLINOIS

Local Public Agency

Rock Island County

County

Rock Island

Section Number

23-00399-00-MG

Route(s) (Street/Road Name)

Maint. Garage Locker Room Addition - Milan Yard

Type of Funds

ARPA

☐ Proposal Only ☐ Proposal and Plans ☒ Proposal only, plans are separate

Submitted/Approved

For Local Public Agency:

For a County and Road District Project

Submitted/Approved

Highway Commissioner Signature & Date

Submitted/Approved

County Engineer/Superintendent of Highways Signature & Date

Matthew M. M. 10/23/24

For a Municipal Project

Submitted/Approved/Passed

Signature & Date

Official Title

Department of Transportation

Released for bid based on limited review

Regional Engineer Signature & Date

N/A

Note: All proposal documents, including Proposal Guaranty Checks or Proposal Bid Bonds, should be stapled together to prevent loss when bids are processed.

Local Public Agency	County	Section Number	Route(s) (Street/Road Name)
Rock Island County	Rock Island	23-00399-00-MG	Maint. Garage Locker Room Addition

NOTICE TO BIDDERS

Sealed proposals for the project described below will be received at the office of the County Engineer,

851 West 10th Avenue, P.O. Box 797, Milan, IL 61264-0797
 Address until 10:00 AM on 11/08/24
 Name of Office Time Date

Sealed proposals will be opened and read publicly at the office of the County Engineer,

851 West 10th Avenue, Milan, IL 61264-0797
 Address at 10:00 AM on 11/08/24
 Name of Office Time Date

DESCRIPTION OF WORK

Location	Project Length
Maintenance Garage Locker Room Addition - Milan Yard	

Proposed Improvement
 This project involves the renovation of three restrooms and an addition to the Maintenance Building and associated site work for Rock Island County Highway Department, Milan, IL.

1. Plans and proposal forms will be available in the office of

The County Engineer, 851 West 10th Avenue, P.O. Box 797, Milan, Illinois 61264-0797

2. ☐ Prequalification

If checked, the 2 apparent as read low bidders must file within 24 hours after the letting an "Affidavit of Availability" (Form BC 57) in triplicate, showing all uncompleted contracts awarded to them and all low bids pending award for Federal, State, County, Municipal and private work. One original shall be filed with the Awarding Authority and two originals with the IDOT District Office.

3. The Awarding Authority reserves the right to waive technicalities and to reject any or all proposals as provided in BLRS Special Provision for Bidding Requirements and Conditions for Contract Proposals.

4. The following BLR Forms shall be returned by the bidder to the Awarding Authority:

- Local Public Agency Formal Contract Proposal (BLR 12200)
- Schedule of Prices (BLR 12201)
- Proposal Bid Bond (BLR 12230) (if applicable)

~~d. Apprenticeship or Training Program Certification (BLR 12325) (do not use for project with Federal funds.)~~

~~e. Affidavit of Illinois Business Office (BLR 12326) (do not use for project with Federal funds.)~~

5. The quantities appearing in the bid schedule are approximate and are prepared for the comparison of bids. Payment to the Contractor will be made only for the actual quantities of work performed and accepted or materials furnished according to the contract. The scheduled quantities of work to be done and materials to be furnished may be increased, decreased or omitted as hereinafter provided.

6. Submission of a bid shall be conclusive assurance and warranty the bidder has examined the plans and understands all requirements for the performance of work. The bidder will be responsible for all errors in the proposal resulting from failure or neglect to conduct an in depth examination. The Awarding Authority will, in no case, be responsible for any costs, expenses, losses or changes in anticipated profits resulting from such failure or neglect of the bidder.

7. The bidder shall take no advantage of any error or omission in the proposal and advertised contract.

8. If a special envelope is supplied by the Awarding Authority, each proposal should be submitted in that envelope furnished by the Awarding Agency and the blank spaces on the envelope shall be filled in correctly to clearly indicate its contents. When an envelope other than the special one furnished by the Awarding Authority is used, it shall be marked to clearly indicate its contents. When sent by mail, the sealed proposal shall be addressed to the Awarding Authority at the address and in care of the official in whose office the bids are to be received. All proposals shall be filed prior to the time and at the place specified in the Notice to Bidders. Proposals received after the time specified will be returned to the bidder unopened.

9. Permission will be given to a bidder to withdraw a proposal if the bidder makes the request in writing or in person before the time for opening proposals.

NOT FOR
BIDDING

Local Public Agency	County	Section Number	Route(s) (Street/Road Name)
Rock Island County	Rock Island	23-00399-00-MG	Maint. Garage Restroom Addition

PROPOSAL

1. Proposal of _____
Contractor's Name _____
Contractor's Address _____
2. The plans for the proposed work are those prepared by Willett Hofmann & Associates
and approved by the Department of Transportation on _____
3. The specifications referred to herein are those prepared by the Department of Transportation and designated as "Standard Specifications for Road and Bridge Construction" and the "Supplemental Specifications and Recurring Special Provisions" thereto, adopted and in effect on the date of invitation for bids.
4. The undersigned agrees to accept, as part of the contract, the applicable Special Provisions indicated on the "Check Sheet for Recurring Special Provisions" contained in this proposal.
5. The undersigned agrees to complete the work within _____ working days or by 08/01/25 unless additional time is granted in accordance with the specifications.
6. The successful bidder at the time of execution of the contract will _____ be required to deposit a contract bond for the full amount of the award. When a contract bond is not required, the proposal guaranty check will be held in lieu thereof. If this proposal is accepted and the undersigned fails to execute a contract and contract bond as required, it is hereby agreed that the Bid Bond of check shall be forfeited to the Awarding Authority.
7. Each pay item should have a unit price and a total price. If no total price is shown or if there is a discrepancy between the products of the unit price multiplied by the quantity, the unit price shall govern. If a unit price is omitted, the total price will be divided by the quantity in order to establish a unit price. A bid may be declared unacceptable if neither a unit price nor a total price is shown.
8. The undersigned submits herewith the schedule of prices on BLR 12201 covering the work to be performed under this contract.
9. The undersigned further agrees that if awarded the contract for the sections contained in the combinations on BLR 12201, the work shall be in accordance with the requirements of each individual proposal for the multiple bid specified in the Schedule for Multiple Bids below.
10. A proposal guaranty in the proper amount, as specified in BLRS Special Provision for Bidding Requirements and Conditions for Contract Proposals, will be required. Bid Bonds will _____ be allowed as a proposal guaranty. Accompanying this proposal is either a bid bond, if allowed, on Department form BLR 12230 or a proposal guaranty check, complying with the specifications, made payable to: Camlin Treasurer of Rock Island County, IL
The amount of the check is _____ (_____).

Attach Cashier's Check or Certified Check Here

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

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

Chapter 18

Defining Responsible Bidder

SECTION

1-18-1

NOT FOR
BIDDING

WHEREAS, the definition of responsible bidder needs to be expanded in the case of bidders for construction projects (construction of new facilities, renovation of current facilities, or road construction projects) over \$20,000;

NOW, THEREFORE, BE IT *ORDAINED* by the County Board of Rock Island County, Illinois, that the following definition be adopted:

Responsible Bidder for construction contracts means a bidder as defined in 55 ILCS 5/5-1022(b). The county will also consider:

- A. All applicable laws prerequisite to doing business in Illinois.
- B. Evidence of compliance with:
 - 1. Federal Employer Tax Identification Number or Social Security Number (for individuals)
 - 2. Provisions of Section 2000(e) of Chapter 21, Title 42 of the United States Code and Federal Executive Order No. 11246 as amended by Executive Order No. 11375 (known as the Equal Opportunity Employer provisions).
- C. Certificates of insurance indicating the following coverages: general liability, worker's compensation, completed operations, automobile, hazardous occupation, product liability, and professional liability.
- D. Compliance with all provisions of the Illinois Prevailing Wage Act, including wages, medical and hospitalization insurance, and retirement for those trades as covered in the Act.
- E. Active participation in apprenticeship and training with craft specific programs approved and registered with the United States Department of Labor's Bureau of Apprenticeship and Training.

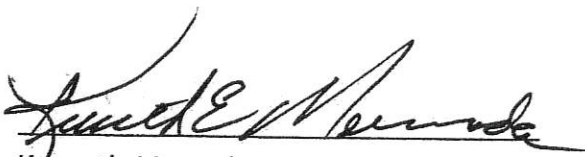
- F. Highway Department projects shall be exempt from provisions in this Ordinance that are not in concurrence with Illinois Department of Transportation rules.
- G. The provisions of this Ordinance shall not apply to federally funded construction projects if such application would jeopardize the receipt or use of federal funds in support of such a project.
- H. All contractors and sub-contractors are required to turn in certified payroll on a weekly basis.
- I. All bidding contractors or subcontractors performing work on public works projects in Rock Island County shall provide proof that they have a program or policy in place for the prevention of drug abuse.
- J. Certification from the bidder that all employees expected to perform work on the project have completed a 10-hour or greater OSHA safety program in the last 5 years. Only workers who have satisfactorily completed a 10-hour or greater OSHA safety program will be allowed to participate in the project. The bidder must have copies of employee OSHA cards on file and the county may request that the bidder provide copies of employee OSHA cards. Failure to produce an employee's OSHA card may result in determination that a bidder is not a responsible bidder.

BE IT FURTHER *ORDAINED* that nothing herein hereby adopted shall be construed to affect any suit or proceeding now pending in any court or any rights accrued or liability incurred or cause or causes of action accrued or existing under any prior Resolution or Ordinance. Nor shall any right or remedy of any character be lost, impaired, or affected by this ordinance.

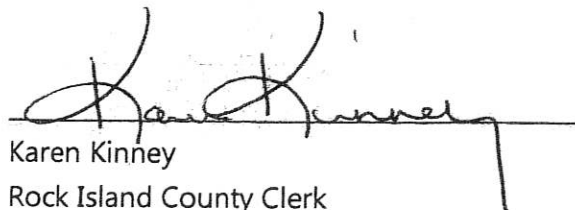
BE IT FURTHER *ORDAINED* that this Ordinance shall be in full force and effect immediately upon adoption.

Done in open meeting this 18th day of October, 2016

ATTEST:



Kenneth Maranda
Rock Island County Board Chairman



Karen Kinney
Rock Island County Clerk



RETURN WITH BID

CONTRACTOR CERTIFICATIONS

County	Rock Island
Local Public Agency	Rock Island County
Section Number	23-00399-00-MS
Route	Milan Yard

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

1. **Debt Delinquency.** The bidder or contractor or subcontractor, respectively, certifies that it is not delinquent in the payment of any tax administered by the Department of Revenue unless the individual or other entity is contesting, in accordance with the procedures established by the appropriate revenue Act, its liability for the tax or the amount of tax. Making a false statement voids the contract and allows the Department to recover all amounts paid to the individual or entity under the contract in a civil union.
2. **Bid-Rigging or Bid Rotating.** The bidder or contractor or subcontractor, respectively, certifies that it is not barred from contracting with the Department by reason of a violation of either 720 ILCS 5/33E-3 or 720 ILCS 5/33E-4.

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

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

3. **Bribery.** The bidder or contractor or subcontractor, respectively, certifies that it has not been convicted of bribery or attempting to bribe an officer or employee of the State of Illinois or any unit of local government, nor has the firm made an admission of guilt of such conduct which is a matter of record, nor has an official, agent, or employee of the firm committed bribery or attempted bribery on behalf of the firm and pursuant to the direction or authorization of a responsible official of the firm.
4. **Interim Suspension or Suspension.** The bidder or contractor or subcontractor, respectively, certifies that it is not currently under a suspension as defined in Subpart 1 of Title 44 Subtitle A Chapter III Part 6 of the Illinois Administrative Code. Furthermore, if suspended prior to completion of this work, the contract or contracts executed for the completion of this work may be cancelled.

RETURN WITH BID

County Rock Island
Local Public Agency Rock Island County
Section Number 23-00399-00-MG
Route Milan Yard

CONTRACTOR CERTIFICATIONS CONT.

5. **Valid Business.** Our company is eligible to do business in the State of Illinois and have submitted as part of this bid a valid business license and the Federal Employer Tax Identification Number (FEIN) or Social Security Number for individuals.

FEIN # _____

**NOT FOR
BIDDING**

6. **Joint Apprenticeship Training Program.** If applicable, our company will employ apprentices who are properly indentured into a Joint Apprenticeship Training Program which is registered and certified with the United States Department of Labor, Bureau of Apprenticeship and Training.

YES _____

NO _____

7. **OSHA Safety Program.** All employees expected to perform work on the project have completed a 10-hour or greater OSHA Safety program in the last 5 years.

YES _____

NO _____



BYRD ANTI-LOBBYING AMENDMENT

Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING –
REQUIRED FOR CONTRACTS OVER \$100,000 Certification for Contracts, Grants, Loans, and Cooperative Agreements. The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code.

Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

Signature of Contractor's Authorized Official

Name and Title of Contractor's Authorized Official

Date

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents of all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, United States Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

**[NOT FOR
BIDDING]**

Organization: _____

Street address: _____

City, State, Zip: _____

CERTIFIED BY: _____
(type or print)

TITLE: _____

(signature)

(date)

Approved by OMB

**[NOT FOR
BIDDING]**

0348-0046

Disclosure of Lobbying Activities

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure)

1. Type of Federal Action: a. contract ____ b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	2. Status of Federal Action: a. bid/offer/application ____ b. initial award c. post-award	3. Report Type: a. initial filing ____ b. material change For material change only: Year _____ quarter _____ Date of last report _____
4. Name and Address of Reporting Entity: ____ Prime ____ Subawardee Tier _____, if Known: Congressional District, if known:	5. If Reporting Entity in No. 4 is Subawardee, Enter Name and Address of Prime: Congressional District, if known:	
6. Federal Department/Agency:	7. Federal Program Name/Description: CFDA Number, if applicable: _____	
8. Federal Action Number, if known:	9. Award Amount, if known: \$	
10. a. Name and Address of Lobbying Registrant (if individual, last name, first name, MI):	b. Individuals Performing Services (including address if different from No. 10a) (last name, first name, MI):	
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.	Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____	
Federal Use Only	Authorized for Local Reproduction Standard Form - LLL (Rev. 7-97)	

**[NOT FOR
BIDDING]**

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitations for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Included prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10(a). Enter Last Name, First Name, and Middle Initial (MI).
11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503



Maint. Garage Restroom Addition - Milan Yard

NOT FOR BIDDING

1. Each pay item should have a unit price and a total price.
2. If no total price is shown or if there is a discrepancy between the product of the unit price multiplied by the quantity, the unit price shall govern.
3. If a unit price is omitted, the total price will be divided by the quantity in order to establish a unit price.
4. A bid may be declared unacceptable if neither a unit price or total price is shown.

Local Public Agency	County	Section Number	Route(s) (Street/Road Name)
Rock Island County	Rock Island	23-00399-00-MG	Maint. Garage Restroom Addition

SIGNATURES

(If an individual)

Bidder Signature & Date

Business Address

City

State

Zip Code

NOT FOR BIDDING

Firm Name

Signature & Date

Title

Business Address

City

State

Zip Code

Insert the Names and Addresses of all Partners

(If a corporation)

Corporate Name

Signature & Date

Title

Business Address

City

State

Zip Code

Insert Names of Officers

President

Attest:

Secretary

Secretary

Treasurer

**NOT FOR
BIDDING**



**Illinois Department
of Transportation**

**Local Public Agency
Proposal Bid Bond**

Local Public Agency Rock Island County	County Rock Island	Section Number 23-00399-00-MG

**NOT FOR
BIDDING**

WE, _____ as PRINCIPAL, and
_____ as SURETY, are held jointly,

severally and firmly bound unto the above Local Public Agency (hereafter referred to as "LPA") in the penal sum of 5% of the total bid price, or for the amount specified in the proposal documents in effect on the date of invitation for bids, whichever is the lesser sum. We bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly pay to the LPA this sum under the conditions of this instrument.

WHEREAS THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH that, the said PRINCIPAL is submitting a written proposal to the LPA acting through its awarding authority for the construction of the work designated as the above section.

THEREFORE if the proposal is accepted and a contract awarded to the PRINCIPAL by the LPA for the above designated section and the PRINCIPAL shall within fifteen (15) days after award enter into a formal contract, furnish surety guaranteeing the faithful performance of the work, and furnish evidence of the required insurance coverage, all as provided in the "Standard Specifications for Road and Bridge Construction" and applicable Supplemental Specifications, then this obligation shall become void; otherwise it shall remain in full force and effect.

IN THE EVENT the LPA determines the PRINCIPAL has failed to enter into a formal contract in compliance with any requirements set forth in the preceding paragraph, then the LPA acting through its awarding authority shall immediately be entitled to recover the full penal sum set out above, together with all court costs, all attorney fees, and any other expense of recovery.

IN TESTIMONY WHEREOF, the said PRINCIPAL and the said SURETY have caused this instrument to be signed by their respective officers this _____ of _____
Day Month and Year

Principal

Company Name

Signature & Date
By: _____
Title

Company Name

Signature & Date
By: _____
Title

(If Principal is a joint venture of two or more contractors, the company names, and authorized signatures of each contractor must be affixed.)

Surety

Name of Surety

Signature of Attorney-in-Fact Signature & Date
By: _____

STATE OF IL
COUNTY OF

I _____, a Notary Public in and for said county do hereby certify that

(Insert names of individuals signing on behalf of PRINCIPAL & SURETY)

who are each personally known to me to be the same persons whose names are subscribed to the foregoing instrument on behalf of PRINCIPAL and SURETY, appeared before me this day in person and acknowledged respectively, that they signed and delivered said instruments as their free and voluntary act for the uses and purposes therein set forth.

Given under my hand and notarial seal this _____ day of _____
Day Month and Year

(SEAL, if required by the LPA)

Notary Public Signature & Date

Date commission expires _____

Rock Island County

Rock Island

23-00399-00-MG



Local Public Agency	County	Section Number
Rock Island County	Rock Island	23-00399-00-MG

The following Special Provision supplement the "Standard Specifications for Road and Bridge Construction", adopted

January 1, 2024, the latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways", and the "Manual of Test Procedures of Materials" in effect on the date of invitation of bids, and the Supplemental Specification and Recurring Special Provisions indicated on the Check Sheet included here in which apply to and govern the construction of the above named section, and in case of conflict with any parts, or parts of said Specifications, the said Special Provisions shall take precedence and shall govern.

NATURE OF WORK:

Rock Island County Highway Department will receive bids for the construction of an addition in conjunction with extensive updates to the Level One Locker Room located in the Maintenance Garage at the Milan Yard. The project will also include updates to the Level Two Maintenance Garage Bathroom and Administration Bathrooms also located at the Rock Island County Highway Department, Milan Yard, 851 W. 10th Avenue, Milan, IL 61264.

All work to be completed no later than August 1, 2025 and shall be completed when temperatures meet the manufacturers specifications for the materials used on the project. With the approval of the Highway Department, some work may begin in 2024 if weather permits.

DATES:

1. Public Notice Issued: October 24, 2024
2. Site Visit Period: October 24 - November 7, 2024
3. Bid Proposals Due: November 8, 2024 at 10:00 AM
4. Bid Opening: November 8, 2024 at 10:00 AM
5. Public Works Committee Award: November 12, 2024
6. County Board Contract Approval: November 19, 2024
7. Notice to Proceed Issued: TBD
8. Work to be Completed: August 1, 2025

SITE VISITS AND QUESTIONS

A site visit is encouraged and can be arranged by contacting Matthew Miller at (309) 787-4668 during normal working hours of 7:00 AM - 3:30 PM. Bidders will be responsible for exact measurements and ensuring that they have included all reasonable factors in their bid submission.

Addenda will be issued for clarification if necessary.

GENERAL:

The work in general terms shall consist of furnishing all labor, materials, related equipment, tools, permits and supervision necessary for the completion of all proposed locker and bathroom improvements located at the Rock Island County Highway Department, Milan yard maintenance and administration buildings.

Experience in identical work that the Contractor proposes is required and the bidders shall submit at least three (3) locations, listing names of owners, addresses and telephone numbers where they have completed similar work in the past two years.

Each bidder shall specify the warranty provided.

The Contractor and subcontractors shall comply with the manufacturers written instructions and recommendations for installing products in applications indicated.

Local Public Agency	County	Section Number
Rock Island County	Rock Island	23-00399-00-MG

TERMS & CONDITIONS

Terms and Conditions

The County reserves the right to reject any or all bids, to waive any irregularities or informality in any bids or in the bidding, and to accept or reject any item or combination of items. The award of bid, if made by the County of Rock Island, will be to the qualified bidder whose response best complies with all of the requirements set forth in the proposal.

Right of Rejection

The County reserves the right to accept or reject any and all responses to this bid proposal. The County also reserves the right to enter into discussions and/or negotiations with one or more qualified suppliers at the same time.

Right of Negotiation

The County reserves the right to negotiate with the lowest and/or best proposer after the bid opening and establishment of the low cost/responsible bidder, before the contract is awarded and/or after contract award. The County reserves the right to negotiate the exact terms and conditions of the contract with the selected proposer.

Codes & Regulations

The Proposer must comply with all applicable State and Federal Laws.

Indemnification

The bidder shall agree to indemnify and hold harmless the County, their officers and employees, from and against any and all claims, losses, judgements, liabilities or claims for attorneys' fees arising out of or resulting in whole or in part from the acts, errors, omissions or negligence of the provider's employees or agents. The duty to indemnify shall survive the expiration of the contract.

Questions/Addenda

Any questions concerning the conditions or specifications shall be directed to the designated contact person. Addenda items will be posted on the Rock Island County Website. It is the bidder's responsibility to check and verify that addenda have been issued. Failure to acknowledge addenda on the bid proposal may result in the offer not being considered.

Insurance Required

The successful bidder is required to furnish evidence of the following insurance requirements. Work may not commence until the Certificates of Insurance have been received. The coverage amounts are as follows:

Workers' Compensation Insurance

The Contractor shall procure and maintain during the life of this contract, Workers' Compensation Insurance, including Employers' Liability Coverage, in accordance with all applicable statutes of the State of Illinois.

Commercial General Liability Insurance

The Contractor shall procure and maintain during the life of this contract, Commercial General Liability Insurance on an "Occurrence Basis" with limits of liability not less than \$1,000,000.00 per occurrence and aggregate combined single limit, Personal Injury, Bodily Injury, and Property Damage. Coverage shall include the following extensions: (A) Contractual Liability; (B) Products and Completed Operations; (C) Independent Contractors Coverage; (D) Broad Form General Liability Extensions or equivalent.

Local Public Agency	County	Section Number
Rock Island County	Rock Island	23-00399-00-MG

The Commercial General Liability Insurance as described above, shall include an endorsement stating the following - Additional Insured: Rock Island County, all elected and appointed officials, all employees and volunteers, all boards, commissions, and/or authorities and board members, including employees and volunteers thereof.

Motor Vehicle Liability

The Contractor, or its subcontractors shall procure and maintain during the life of this contract Motor Vehicle Liability Insurance.

Pre-award Presentations

The County of Rock Island reserves the right to require presentation from the highest-ranking proposer(s), in which they may be asked to provide additional information.

FEDERAL FUNDING REQUIREMENTS:

The final approved contract will meet the definition of "federal assisted construction contract" therefore the following applies:

Compliance with Equal Employment Opportunity

Executive Order 11246 applies to businesses with federal contracts and federally assisted construction contracts totaling more than \$10,000. As a condition of these contracts, businesses agree to not discriminate on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin, and to take affirmative actions to ensure equal employment opportunity. Additionally, these federal contractors agree not to take adverse employment actions against applicants and employees who, under certain circumstances, ask about, discuss, or share information about their pay or the pay of their co-workers.

If a company has at least 50 employees and a single contract of \$50,000 or more, then it must also develop an Affirmative Action Program (AAP), as described at 41 CFR 60-2. Companies whose sole coverage comes from construction contracts or federally assisted construction contracts are not required to develop an AAP, but they must comply with 16 specific affirmative actions outlined in the equal opportunity construction contract clause.

Compliance with the Davis - Bacon Act

All prime construction contracts in excess of \$2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141- 3144) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction").

In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week.

A copy of Rock Island County's recent wage determinations is available on the County website. Any decisions to award a contract or subcontract must be conditioned upon the acceptance of the wage determinations. Additionally, it is required that a weekly statement with respect to the wages paid each employee during the preceding week is provided to the County of Rock Island. An optional form for completion from the U.S. Department of Labor is attached.

Local Public Agency	County	Section Number
Rock Island County	Rock Island	23-00399-00-MG

Compliance with the Copeland "Anti-Kickback" Act

The Act provides that each contractor or sub recipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

Contract Work Hours

Each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week.

Compliance with the Safety Standards Act

No contractor or subcontractor contracting for any part of the contract work shall require any laborer or mechanic employed in the performance of the contract to work in surroundings or under working conditions that are unsanitary, hazardous, or dangerous to health or safety, as established under construction safety and health standards the Secretary of Labor prescribes.

Compliance with the Clean Air Act

The contractor must agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act and the Federal Water Pollution Control Act as amended. Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

Debarment and Suspension

No contract will be awarded to any party parties listed on the government wide exclusions in the System for Award Management (SAM). SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority.

Compliance with the Byrd Anti-Lobbying Amendment

Contractors that apply or bid for an award exceeding \$100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

PREVAILING WAGES

This contract call for the construction of a "public work" within the meaning of the Illinois Prevailing Wage Act 820 ILCS 130/01 et seq. ("the Act"). The Act requires contractors and subcontractors to pay laborers, workers and mechanics performing services on public works projects no less than the "prevailing rate of Wages" (hourly cash plus fringe benefits) in the county where the work is performed. For information regarding current prevailing wage rates, please refer to the Illinois Department of Labor's website at: <http://www.state.il.us/agency/idol/rates/rates.HTM>. All contractors and subcontractors rendering service under this contract must comply with all requirements of the Act, including but not limited to, all wage, notice and record keeping duties. Certified payrolls shall be required per LRS12.

Local Public Agency	County	Section Number
Rock Island County	Rock Island	23-00399-00-MG

The monthly updates can also be obtained at the following location;

Office of the Rock Island County Clerk
1504 Third Avenue
Rock Island, Illinois 61201
Tel. (309) 558-3570

Instructions for BLR 11310

This form shall be used as the starting paragraph for the special provision packet included in Federal Aid, Township Bridge (TBP) and Motor Fuel Tax (MFT) roadway improvement and maintenance projects. For more information see Chapter 11 of the Bureau of Local Roads and Street Manual (BLRS Manual).

SPECIAL PROVISION
Bidding Requirements and Conditions

Prequalification of Bidders:

"The provisions for prequalification of bidders as stated in the second paragraph of LRS 6 and LRS 7 shall not apply to this proposal."



Check Sheet for Recurring Special Provisions

Local Public Agency	County	Section Number
Rock Island County	Rock Island	23-00399-00-MG

☐ Check this box for lettings prior to 01/01/2024.

The Following Recurring Special Provisions Indicated By An "X" Are Applicable To This Contract And Are Included By Reference:

Recurring Special Provisions

<u>Check Sheet #</u>		<u>Page No.</u>
1	☐ Additional State Requirements for Federal-Aid Construction Contracts	59
2	☐ Subletting of Contracts (Federal-Aid Contracts)	62
3	☐ EEO	63
4	☐ Specific EEO Responsibilities Non Federal-Aid Contracts	73
5	☐ Required Provisions - State Contracts	78
6	☐ Asbestos Bearing Pad Removal	84
7	☐ Asbestos Waterproofing Membrane and Asbestos HMA Surface Removal	85
8	☐ Temporary Stream Crossings and In-Stream Work Pads	86
9	☐ Construction Layout Stakes	87
10	☐ Use of Geotextile Fabric for Railroad Crossing	90
11	☐ Subsealing of Concrete Pavements	92
12	☐ Hot-Mix Asphalt Surface Correction	96
13	☐ Pavement and Shoulder Resurfacing	98
14	☐ Patching with Hot-Mix Asphalt Overlay Removal	99
15	☐ Polymer Concrete	101
16	☐ Reserved	103
17	☐ Bicycle Racks	104
18	☐ Temporary Portable Bridge Traffic Signals	106
19	☐ Nighttime Inspection of Roadway Lighting	108
20	☐ English Substitution of Metric Bolts	109
21	☐ Calcium Chloride Accelerator for Portland Cement Concrete	110
22	☐ Quality Control of Concrete Mixtures at the Plant	111
23	☐ Quality Control/Quality Assurance of Concrete Mixtures	119
24	☐ Reserved	135
25	☐ Reserved	136
26	☐ Temporary Raised Pavement Markers	137
27	☐ Restoring Bridge Approach Pavements Using High-Density Foam	138
28	☐ Portland Cement Concrete Inlay or Overlay	141
29	☐ Portland Cement Concrete Partial Depth Hot-Mix Asphalt Patching	145
30	☐ Longitudinal Joint and Crack Patching	148
31	☐ Concrete Mix Design - Department Provided	150
32	☐ Station Numbers in Pavements or Overlays	151

Local Public Agency	County	Section Number
Rock Island County	Rock Island	23-00399-00-MG

The Following Local Roads And Streets Recurring Special Provisions Indicated By An "X" Are Applicable To This Contract And Are Included By Reference:

Local Roads And Streets Recurring Special Provisions

<u>Check Sheet #</u>		<u>Page No.</u>
LRS 1	Reserved	153
LRS 2	☐ Furnished Excavation	154
LRS 3	☐ Work Zone Traffic Control Surveillance	155
LRS 4	☐ Flaggers in Work Zones	156
LRS 5	☒ Contract Claims	157
LRS 6	☒ Bidding Requirements and Conditions for Contract Proposals	158
LRS 7	☐ Bidding Requirements and Conditions for Material Proposals	164
LRS 8	Reserved	170
LRS 9	☐ Bituminous Surface Treatments	171
LRS 10	Reserved	175
LRS 11	☒ Employment Practices	176
LRS 12	☒ Wages of Employees on Public Works	178
LRS 13	☒ Selection of Labor	180
LRS 14	☐ Paving Brick and Concrete Paver Pavements and Sidewalks	181
LRS 15	☒ Partial Payments	184
LRS 16	☐ Protests on Local Lettings	185
LRS 17	☒ Substance Abuse Prevention Program	186
LRS 18	☐ Multigrade Cold Mix Asphalt	187
LRS 19	☐ Reflective Crack Control Treatment	188

CHECK SHEET #LRS5

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

**SPECIAL PROVISION
FOR
CONTRACT CLAIMS**

Effective: January 1, 2002
Revised: January 1, 2007

Revise the second sentence of subparagraph (a) of Article 109.09 of the Standard Specifications to read:

"All claims shall be submitted to the Engineer."

Revise subparagraph (e) of Article 109.09 of the Standard Specifications to read:

"(e) Procedure. All Claims shall be submitted to the Engineer. The Engineer will consider all information submitted with the claim. Claims not conforming to this Article will be returned without consideration. The Engineer may schedule a claim presentation meeting if, in the Engineer's judgment, such a meeting would aid in resolution of the claim, otherwise a decision will be based on the claim documentation submitted. A final decision will be rendered within 90 days of receipt of the claim.

Full compliance by the Contractor with the provisions specified in this Article is a contractual condition precedent to the Contractor's right to seek relief in the Court of Claims. The Engineer's written decision shall be the final administrative action of the Department. Unless the Contractor files a claim for adjudication by the Court of Claims within 60 days after the date of the written decision, the failure to file shall constitute a release and waiver of the claim."

CHECK SHEET #LRS6

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
BIDDING REQUIREMENTS AND CONDITIONS FOR CONTRACT PROPOSALS

Effective: January 1, 2002
Revised: January 1, 2015

Replace Article 102.01 of the Standard Specifications with the following:

"Prequalification of Bidders. When prequalification is required and the Awarding Authority for contract construction work is the County Board of a County, the Council, the City Council, or the President and Board of Trustees of a city, village, or town, each prospective bidder, in evidence of competence, shall furnish the Awarding Authority as a prerequisite to the release of proposal forms by the Awarding Authority, a certified or photostatic copy of a "Certificate of Eligibility" issued by the Department of Transportation, according to the Department's "Prequalification Manual".

The two low bidders must file, within 24 hours after the letting, a sworn affidavit in triplicate, showing all uncompleted contracts awarded to them and all low bids pending award for Federal, State, County, Municipal and private work, using the blank form made available for this affidavit. One copy shall be filed with the Awarding Authority and two copies with IDOT's District office.

Issuance of Proposal Forms. The Awarding Authority reserves the right to refuse to issue a proposal form for bidding purposes for any of the following reasons:

- (a) Lack of competency and adequate machinery, plant, and other equipment, as revealed by the financial statement and experience questionnaires required in the prequalification procedures.
- (b) Uncompleted work which, in the judgment of the Awarding Authority, might hinder or prevent the prompt completion of additional work awarded.
- (c) False information provided on a bidder's "Affidavit of Availability".
- (d) Failure to pay, or satisfactorily settle, all bills due for labor and material on former contracts in force at the time of issuance of proposal forms.
- (e) Failure to comply with any prequalification regulations of the Department.
- (f) Default under previous contracts.
- (g) Unsatisfactory performance record as shown by past work for the Awarding Authority, judged from the standpoint of workmanship and progress.
- (h) When the Contractor is suspended from eligibility to bid at a public letting where the contract is awarded by, or requires approval of, the Department.

CHECK SHEET #LRS6

- (i) When any agent, servant, or employee of the prospective bidder currently serves as a member, employee, or agent of a governmental body that is financially involved in the proposal work.
- (j) When any agent, servant, or employee of the perspective bidder has participated in the preparation of plans or specifications for the proposed work.

Interpretation of Quantities in the Bid Schedule. The quantities appearing in the bid schedule are approximate and are prepared for the comparison of bids. Payment to the Contractor will be made only for the actual quantities of work performed and accepted or materials furnished according to the contract. The scheduled quantities of work to be done and materials to be furnished may be increased, decreased, or omitted as hereinafter provided.

Examination of Plans, Specifications, Special Provisions, and Site of Work. The bidder shall, before submitting a bid, carefully examine the provisions of the contract. The bidder shall inspect in detail the site of the proposed work, investigate and become familiar with all the local conditions affecting the contract and fully acquaint themselves with the detailed requirements of construction. Submission of a bid shall be a conclusive assurance and warranty the bidder has made these examinations and the bidder understands all requirements for the performance of the work. If his/her bid is accepted, the bidder shall be responsible for all errors in the proposal resulting from his/her failure or neglect to comply with these instructions. The Awarding Authority will, in no case, be responsible for any costs, expenses, losses, or change in anticipated profits resulting from such failure or neglect of the bidder to make these examinations.

The bidder shall take no advantage of any error or omission in the proposal and advertised contract. Any prospective bidder who desires an explanation or interpretation of the plans, specification, or any of the contract documents, shall request such in writing from the Awarding Authority, in sufficient time to allow a written reply by the Awarding Authority that can reach all prospective bidders before the submission of their bids. Any reply given a prospective bidder concerning any of the contract documents, plans, and specifications will be furnished to all prospective bidders in the form determined by the Awarding Authority including, but not limited to, an addendum, if the information is deemed by the Awarding Authority to be necessary in submitting bids or if the Awarding Authority concludes the information would aid competition. Oral explanations, interpretations, or instructions given before the submission of bids unless at a prebid conference will not be binding on the Awarding Authority.

Preparation of the Proposal. Bidders shall submit their proposals on the form furnished by the Awarding Authority. The proposal shall be executed properly, and bids shall be made for all items indicated in the proposal form, except when alternate bids are asked, a bid on more than one alternate for each item is not required, unless otherwise provided. The bidder shall indicate in figures, a unit price for each of the separate items called for in the proposal form; the bidder shall show the products of the respective quantities and unit prices in the column provided for that purpose, and the gross sum shown in the place indicated in the proposal form shall be the

CHECK SHEET #LRS6

summation of said products. All writing shall be with ink or typewriter, except the signature of the bidder which shall be written in ink.

If the proposal is made by an individual, that individual's name and business address shall be shown. If made by a firm or partnership, the name and business address of each member of the firm or partnership shall be shown. If made by a corporation, the proposal shall show the names, titles, and business addresses of the president, corporate secretary and treasurer. The proposal shall be signed by president or someone with authority to execute contracts and attested by the corporate secretary or someone with authority to execute or attest to the execution of contracts.

When prequalification is required, the proposal form shall be submitted by an authorized bidder in the same name and style as shown on the "Contractor's Statement of Experience and Financial Condition" used for prequalification.

Rejection of Proposals. The Awarding Authority reserves the right to reject any proposal for any of the conditions in "Issuance of Proposal Forms" or for any of the following reasons:

- (a) More than one proposal for the same work from an individual, firm, partnership, or corporation under the same name or different names.
- (b) Evidence of collusion among bidders.
- (c) Unbalanced proposals in which the bid prices for some items are, in the judgment of the Awarding Authority, out of proportion to the bid prices for other items.
- (d) If the proposal does not contain a unit price for each pay item listed, except in the case of authorized alternate pay items or lump sum pay items.
- (e) If the proposal form is other than that furnished by the Awarding Authority; or if the form is altered or any part thereof is detached.
- (f) If there are omissions, erasures, alterations, unauthorized additions, conditional or alternate bids, or irregularities of any kind which may tend to make the proposal incomplete, indefinite or ambiguous as to its meaning.
- (g) If the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award.
- (h) If the proposal is not accompanied by the proper proposal guaranty.
- (i) If the proposal is prepared with other than ink or typewriter, or otherwise fails to meet the requirements of the above "Preparation of Proposal" section.

Proposal Guaranty. Each proposal shall be accompanied by a bid bond on the Department form contained in the proposal, executed by a corporate surety company satisfactory to the Awarding Authority, by a bank cashier's check or a properly certified check for not less than five percent of the amount bid, or for the amount specified in the following schedule:

CHECK SHEET #LRS6

Bidders. Proposals received after the time specified will be returned to the bidder unopened.

Withdrawal of Proposals. Permission will be given a bidder to withdraw a proposal if the bidder makes the request in writing or in person before the time for opening proposals.

Public Opening of Proposals. Proposals will be opened and read publicly at the time and place specified in the Notice to Bidders. Bidders, their authorized agents, and other interested parties are invited to be present.

Consideration of Proposals. After the proposals are opened and read, they will be compared on the basis of the summation of the products of the quantities shown in the bid schedule by the unit bid prices. In awarding contracts, the Awarding Authority will, in addition to considering the amounts stated in the proposals, take into consideration the responsibility of the various bidders as determined from a study of the data required under "Prequalification of Bidders", and from other investigations which it may elect to make.

The right is reserved to reject any or all proposals, to waive technicalities, or to advertise for new proposals, if in the judgment of the Awarding Authority, the best interests of the Awarding Authority will be promoted thereby.

Award of Contract. The award of contract will be made within 45 calendar days after the opening of proposals to the lowest responsible and qualified bidder whose proposal complies with all the requirements prescribed. The successful bidder will be notified by letter of intent that his/her bid has been accepted, and subject to the following conditions, the bidder will be the Contractor.

An approved contract executed by the Awarding Authority is required before the Awarding Authority is bound. An award may be cancelled any time by the Awarding Authority prior to execution in order to protect the public interest and integrity of the bidding process or for any other reason if, in the judgment of the Awarding Authority, the best interests of the Awarding Authority will be promoted thereby.

If a contract is not awarded within 45 days after the opening of proposals, bidders may file a written request with the Awarding Authority for the withdrawal of their bid, and the Awarding Authority will permit such withdrawal.

Requirement of Contract Bond. If the Awarding Authority requires a Contract Bond, the Contractor or Supplier shall furnish the Awarding Authority a performance and payment bond with good and sufficient sureties in the full amount of the contract as the penal sum. The surety shall be acceptable to the Awarding Authority, shall waive notice of any changes and extensions of time, and shall submit its bond on the form furnished by the Awarding Authority.

Execution of Contract. The contract shall be executed by the successful bidder and returned, together with the Contract Bond, within 15 days after the contract has been mailed to the bidder.

If the bidder to whom the award is made is a corporation organized under the laws of a State other than Illinois, the bidder shall furnish the Awarding Authority a

CHECK SHEET #LRS6

copy of the corporation's Certificate of Authority to do business in the State of Illinois with the return of the executed contract and bond. Failure to furnish such evidence of a Certificate of Authority within the time required will be considered as just cause for the annulment of the award and the forfeiture of the proposal guaranty to the Awarding Authority, not as a penalty, but in payment of liquidated damages sustained as a result of such failure.

Failure to Execute Contract. If the contract is not executed by the Awarding Authority within 15 days following receipt from the bidder of the properly executed contracts and bonds, the bidder shall have the right to withdraw his/her bid without penalty.

Failure of the successful bidder to execute the contract and file acceptable bonds within 15 days after the contract has been mailed to the bidder shall be just cause for the cancellation of the award and the forfeiture of the proposal guaranty which shall become the property of the Awarding Authority, not as penalty, but in liquidation of damages sustained. Award may then be made to the next lowest responsible bidder, or the work may be readvertised and constructed under contract, or otherwise, as the Awarding Authority may decide."

CHECK SHEET #LRS11

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
EMPLOYMENT PRACTICES

Effective: January 1, 1999

In addition to all other labor requirements set forth in this proposal and in the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation, during the performance of this contract, the Contractor for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

Selection of Labor. The Contractor shall comply with all Illinois statutes pertaining to the selection of labor.

Equal Employment Opportunity. During the performance of this contract, the Contractor agrees as follows:

- (a) That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, ancestry, age, marital status, physical or mental handicap or unfavorable discharge from military service, and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.
- (b) That, if it hires additional employees in order to perform this contract or any portion hereof, it will determine the availability of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not underutilized.
- (c) That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, national origin, ancestry, age, marital status, physical or mental handicap or unfavorable discharge from military service.

That it will send to each labor organization or representative of workers with which it has or is bound by collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the Contractor's obligations under the Illinois Human Rights Act and the Department's Rules and Regulations. If any such labor organization or representative fails or refuses to cooperate with the Contractor in its efforts to comply with so such Act and Rules and Regulations, the Contractor will promptly so notify the Illinois Department of Human Rights and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations thereunder.

CHECK SHEET #LRS11

- (e) That it will submit reports as required by the Department of Human Rights Rules and Regulations, furnish all relevant information as may from time to time be requested by the Department or the contracting agency, and in all respects comply with the Illinois Human Rights Act and the Department's Rules and Regulations.
- (f) That it will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency Illinois Department of Human Rights for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Department's Rules and Regulations.
- (g) That it will include verbatim or by reference the provisions of this clause in every subcontract so that such provisions will be binding upon every such subcontractor. In the same manner as with other provisions of this contract, the Contractor will be liable for compliance with applicable provisions of this clause by all its subcontractors; and further it will promptly notify the contracting agency and the Illinois Department of Human Rights in the event any subcontractor fails or refuses to comply therewith. In addition, the Contractor will not utilize any subcontractor declared by the subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations.

CHECK SHEET #LRS12

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
WAGES OF EMPLOYEES ON PUBLIC WORKS

Effective: January 1, 1999

Revised: January 1, 2015

1. Prevailing Wages. All wages paid by the Contractor and each subcontractor shall be in compliance with The Prevailing Wage Act (820 ILCS 130), as amended, except where a prevailing wage violates a federal law, order, or ruling, the rate conforming to the federal law, order, or ruling shall govern. The Illinois Department of Labor publishes the prevailing wage rates on its website. If the Illinois Department of Labor revises the prevailing wage rates, the revised prevailing wage rates on the Illinois Department of Labor's website shall apply to this contract and the Contractor will not be allowed additional compensation on account of said revisions. The Contractor shall review the wage rates applicable to the work of the contract at regular intervals in order to ensure the timely payment of current wage rates. The Contractor agrees that no additional notice is required. The Contractor shall be responsible to notify each subcontractor of the wage rates set forth in this contract and any revisions thereto.
2. Payroll Records. The Contractor and each subcontractor shall make and keep, for a period of not less than five years from the date of the last payment on a contract or subcontract, records of all laborers, mechanics, and other workers employed by them on the project; the records shall include information required by 820 ILCS 130/5 for each worker. Upon seven business days' notice, the Contractor and each subcontractor shall make available for inspection and copying at a location within this State during reasonable hours, the payroll records to the public body in charge of the project, its officers and agents, the Director of Labor and his deputies and agents, and to federal, State, or local law enforcement agencies and prosecutors.
3. Submission of Payroll Records. The Contractor and each subcontractor shall, no later than the 15th day of each calendar month, file a certified payroll for the immediately preceding month with the public body in charge of the project, except that the full social security number and home address shall not be included on weekly transmittals. Instead the payrolls shall include an identification number for each employee (e.g., the last four digits of the employee's social security number). The certified payroll shall consist of a complete copy of the payroll records, except starting and ending times of work each day may be omitted.

The certified payroll shall be accompanied by a statement signed by the Contractor or subcontractor or an officer, employee, or agent of the Contractor or subcontractor which avers that: (i) he or she has examined the certified payroll records required to be submitted by the Act and such records are true and accurate; (ii) the hourly rate paid to each worker is not less than the general

CHECK SHEET #LRS12

prevailing rate of hourly wages required; and (iii) the Contractor or subcontractor is aware that filing a certified payroll that he or she knows to be false is a Class A misdemeanor.

4. **Employee Interviews.** The Contractor and each subcontractor shall permit his/her employees to be interviewed on the job, during working hours, by compliance investigators of the Department or the Department of Labor.

CHECK SHEET #LRS13

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
SELECTION OF LABOR

Effective: January 1, 1999
Revised: January 1, 2012

The Contractor shall comply with all Illinois statutes pertaining to the selection of labor.

Employment of Illinois Workers During Periods of Excessive Unemployment. Whenever there is a period of excessive unemployment in Illinois, which is defined herein as any month immediately following two consecutive calendar months during which the level of unemployment in the State of Illinois has exceeded five percent as measured by the United States Bureau of Labor Statistics in its monthly publication of employment and unemployment figures, the Contractor shall employ at least 90 percent Illinois laborers. "Illinois laborer" means any person who has resided in Illinois for at least 30 days and intends to become or remain an Illinois resident.

Other laborers may be used when Illinois laborers as defined herein are not available, or are incapable of performing the particular type of work involved, if so certified by the Contractor and approved by the Engineer. The Contractor may place no more than three of his regularly employed non-resident executive and technical experts, who do not qualify as Illinois laborers, to do work encompassed by this Contract during a period of excessive unemployment.

This provision applies to all labor, whether skilled, semi-skilled or unskilled, whether manual or non-manual.

CHECK SHEET #LRS15

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
PARTIAL PAYMENTS

Effective: January 1, 2007

Add the following after the first paragraph of Article 109.07(a) of the Standard Specifications:

"The State will deduct from the amount so determined for the first 50 percent of the completed work a sum of ten percent to be retained until after the completion of the entire work to the satisfaction of the Engineer. After 50 percent or more of the work is completed, the Engineer may, at his/her discretion, certify the remaining partial payments without any further retention, provided that satisfactory progress is being made, and provided that the amount retained is not less than five percent of the total adjusted contract price. When the principal items of the work have been satisfactorily completed, a semi-final estimate may be made with the consent of the surety. Payment to the Contractor under such an estimate shall not exceed 90 percent of the amount retained after making partial payments, but in no event shall the amount retained after making the semi-final payment be less than one percent of the adjusted contract price, nor less than \$500.00.

When any payment is made directly to the State, payments for completed work shall have deducted the proportionate share of the cost to be borne by the State. The deduction will be the estimated cost to the State divided by the awarded contract value with this percentage applied to the value of work in place. Any adjustment to be made because of changed quantities will be made when the final payment is being processed. No retainage will be held from the value of such payments."

CHECK SHEET #LRS17

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
SUBSTANCE ABUSE PREVENTION PROGRAM

Effective: January 1, 2008
Revised: January 1, 2014

In addition to all other labor requirements set forth in this proposal and in the Standard Specification for Road and Bridge Construction, adopted by the Department, during the performance of this contract, the Contractor for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

Substance Abuse Prevention Program. Before the Contractor and any subcontractor commences work, the Contractor and any subcontractor shall have in place a written Substance Abuse Prevention Program for the prevention of substance abuse among its employees which meets or exceeds the requirements in 820 ILCS 265 or shall have a collective bargaining agreement in effect dealing with the subject matter of 820 ILCS 265.

The Contractor and any subcontractor shall file with the public body engaged in the construction of the public works: a copy of the Substance Abuse Prevention Program along with a cover letter certifying that their program meets the requirements of the Act, or a letter certifying that the Contractor or a subcontractor has a collective bargaining agreement in effect dealing with the subject matter of this Act.

BDE SPECIAL PROVISIONS
For the November 8, 2024 Lettings

The following special provisions indicated by a "check mark" are applicable to this contract and will be included by the Project Coordination and Implementation Section of the Bureau of Design & Environment (BDE).

File Name	#		Special Provision Title	Effective	Revised
	80099	1	☐ Accessible Pedestrian Signals (APS)	April 1, 2003	Jan. 1, 2022
	80274	2	☐ Aggregate Subgrade Improvement	April 1, 2012	April 1, 2022
	80192	3	☐ Automated Flagger Assistance Devices	Jan. 1, 2008	April 1, 2023
	80173	4	☐ Bituminous Materials Cost Adjustments	Nov. 2, 2006	Aug. 1, 2017
	80426	5	☐ Bituminous Surface Treatment with Fog Seal	Jan. 1, 2020	Jan. 1, 2022
*	80241	6	☐ Bridge Demolition Debris	July 1, 2009	
*	50531	7	☐ Building Removal	Sept. 1, 1990	Aug. 1, 2022
*	50261	8	☐ Building Removal with Asbestos Abatement	Sept. 1, 1990	Aug. 1, 2022
	80449	9	☐ Cement, Type II	Aug. 1, 2023	
	80384	10	☐ Compensable Delay Costs	June 2, 2017	April 1, 2019
*	80198	11	☐ Completion Date (via calendar days)	April 1, 2008	
*	80199	12	☐ Completion Date (via calendar days) Plus Working Days	April 1, 2008	
	80453	13	☐ Concrete Sealer	Nov. 1, 2023	
	80261	14	☐ Construction Air Quality – Diesel Retrofit	June 1, 2010	Nov. 1, 2014
	80434	15	☐ Corrugated Plastic Pipe (Culvert and Storm Sewer)	Jan. 1, 2021	
*	80029	16	☐ Disadvantaged Business Enterprise Participation	Sept. 1, 2000	Mar. 2, 2019
	80229	17	☐ Fuel Cost Adjustment	April 1, 2009	Aug. 1, 2017
	80452	18	☐ Full Lane Sealant Waterproofing System	Nov. 1, 2023	
	80447	19	☐ Grading and Shaping Ditches	Jan. 1, 2023	
	80433	20	☐ Green Preformed Thermoplastic Pavement Markings	Jan. 1, 2021	Jan. 1, 2022
	80443	21	☐ High Tension Cable Median Barrier Removal	April 1, 2022	
	80456	22	☐ Hot-Mix Asphalt	Jan. 1, 2024	
	80446	23	☐ Hot-Mix Asphalt - Longitudinal Joint Sealant	Nov. 1, 2022	Aug. 1, 2023
	80438	24	☐ Illinois Works Apprenticeship Initiative – State Funded Contracts	June 2, 2021	April 2, 2024
	80045	25	☐ Material Transfer Device	June 15, 1999	Jan. 1, 2022
	80450	26	☐ Mechanically Stabilized Earth Retaining Walls	Aug. 1, 2023	
	80441	27	☐ Performance Graded Asphalt Binder	Jan. 1, 2023	
	80451	28	☐ Portland Cement Concrete	Aug. 1, 2023	
	80459	29	☐ Preformed Plastic Pavement Marking	June 2, 2024	
*	34261	30	☐ Railroad Protective Liability Insurance	Dec. 1, 1986	Jan. 1, 2022
	80455	31	☐ Removal and Disposal of Regulated Substances	Jan. 1, 2024	April 1, 2024
	80445	32	☐ Seeding	Nov. 1, 2022	
	80457	33	☐ Short Term and Temporary Pavement Markings	April 1, 2024	April 2, 2024
	80448	34	☐ Source of Supply and Quality Requirements	Jan. 2, 2023	
	80340	35	☐ Speed Display Trailer	April 2, 2014	Jan. 1, 2022
	80127	36	☐ Steel Cost Adjustment	April 2, 2004	Jan. 1, 2022
	80397	37	☐ Subcontractor and DBE Payment Reporting	April 2, 2018	
	80391	38	☐ Subcontractor Mobilization Payments	Nov. 2, 2017	April 1, 2019
	80437	39	☐ Submission of Payroll Records	April 1, 2021	Nov. 2, 2023
	80435	40	☐ Surface Testing of Pavements – IRI	Jan. 1, 2021	Jan. 1, 2023
	80410	41	☐ Traffic Spotters	Jan. 1, 2019	
*	20338	42	☐ Training Special Provisions	Oct. 15, 1975	Sept. 2, 2021
	80429	43	☐ Ultra-Thin Bonded Wearing Course	April 1, 2020	Jan. 1, 2022
	80439	44	☐ Vehicle and Equipment Warning Lights	Nov. 1, 2021	Nov. 1, 2022
	80458	45	☐ Waterproofing Membrane System	Aug. 1, 2024	
	80302	46	☐ Weekly DBE Trucking Reports	June 2, 2012	Nov. 1, 2021
	80454	47	☐ Wood Sign Support	Nov. 1, 2023	
	80427	48	☐ Work Zone Traffic Control Devices	Mar. 2, 2020	
*	80071	49	☐ Working Days	Jan. 1, 2002	

Highlighted items indicate a new or revised special provision for the letting.

An * indicates the special provision requires additional information from the designer, which needs to be submitted separately. The Project Coordination and Implementation Section will then include the information in the applicable special provision.

The following special provisions are in the 2024 Supplemental Specifications and Recurring Special Provisions.

<u>File Name</u>	<u>Special Provision Title</u>	<u>New Location(s)</u>	<u>Effective</u>	<u>Revised</u>
80436	Blended Finely Divided Minerals	Articles 1010.01 & 1010.06	April 1, 2021	
80440	Waterproofing Membrane System	Article 1061.05	Nov. 1, 2021	

PAYMENTS TO SUBCONTRACTORS (BDE)

Effective: November 2, 2017

Add the following to the end of the fourth paragraph of Article 109.11 of the Standard Specifications:

"If reasonable cause is asserted, written notice shall be provided to the applicable subcontractor and/or material supplier and the Engineer within five days of the Contractor receiving payment. The written notice shall identify the contract number, the subcontract or material purchase agreement, a detailed reason for refusal, the value of payment being withheld, and the specific remedial actions required of the subcontractor and/or material supplier so that payment can be made."

80390

This contract calls for the construction of a "public work," within the meaning of the Illinois Prevailing Wage Act, 820 ILCS 130/.01 *et seq.* ("the Act"). The Act requires contractors and subcontractors to pay laborers, workers and mechanics performing services on public works projects no less than the current "prevailing rate of wages" (hourly cash wages plus amount for fringe benefits) in the county where the work is performed. The Department publishes the prevailing wage rates on its website at <http://labor.illinois.gov/>. The Department revises the prevailing wage rates and the contractor/subcontractor has an obligation to check the Department's web site for revisions to prevailing wage rates. For information regarding current prevailing wage rates, please refer to the Illinois Department of Labor's website. All contractors and subcontractors rendering services under this contract must comply with all requirements of the Act, *including but not limited to*, all wage requirements and notice and record keeping duties.

Rock Island County Prevailing Wage Rates posted on 9/16/2024

		Overtime																	
Trade Title	Rg	Type	C	Base	Foreman	M-F	Sa	Su	Hol	H/W	Pension	Vac	Trng	Other Ins	Add OT 1.5x owed	Add OT 2.0x owed			
ASBESTOS ABT-GEN	All	BLD		30.06	32.46	1.5	1.5	2.0	2.0	7.60	15.70	0.00	0.80	0.00	0.00	0.00			
ASBESTOS ABT-GEN	All	HWY		34.27	37.01	1.5	1.5	2.0	2.0	7.60	15.20	0.00	0.80	0.00	0.00	0.00			
ASBESTOS ABT-MEC	All	BLD		30.60	31.60	1.5	1.5	2.0	2.0	10.45	7.00	0.00	0.50	0.00	0.00	0.00			
BOILERMAKER	All	BLD		43.54	46.54	1.5	1.5	2.0	2.0	7.07	24.29	0.00	2.18	0.00	16.38	32.76			
BRICK MASON	All	BLD		34.78	36.28	1.5	1.5	2.0	2.0	12.45	10.35	0.00	0.97		0.00	0.00			
CARPENTER	All	BLD		33.50	35.18	1.5	1.5	2.0	2.0	10.32	17.28	0.00	0.82	0.00	0.00	0.00			
CARPENTER	All	HWY		37.00	38.75	1.5	1.5	2.0	2.0	12.62	20.69	0.00	0.82	0.00	0.00	0.00			
CEMENT MASON	All	BLD		30.79	32.79	1.5	1.5	2.0	2.0	7.60	19.80	0.00	0.65		0.00	0.00			
CEMENT MASON	All	HWY		31.55	33.55	1.5	1.5	2.0	2.0	7.60	19.71	0.00	0.65		0.00	0.00			
CERAMIC TILE FINISHER	All	BLD		26.73		1.5	1.5	2.0	2.0	12.45	8.35	0.00	0.47		0.00	0.00			
ELECTRIC PWR EQMT OP	All	ALL		52.67	57.94	1.5	1.5	2.0	2.0	8.30	14.75	0.00	0.53	0.00	0.00	0.00			
ELECTRIC PWR GRNDMAN	All	ALL		34.64	57.94	1.5	1.5	2.0	2.0	7.94	9.70	0.00	0.35	0.00	0.00	0.00			
ELECTRIC PWR LINEMAN	All	ALL		52.67	57.94	1.5	1.5	2.0	2.0	8.30	14.75	0.00	0.53	0.00	0.00	0.00			
ELECTRICIAN	All	BLD		41.75	43.75	1.5	1.5	2.0	2.0	10.59	16.07	0.00	0.73	0.00	0.00	0.00			
ELECTRONIC SYSTEM TECH	All	BLD		28.00	29.75	1.5	1.5	2.0	2.0	8.35	8.99	0.00	0.35	0.00	0.00	0.00			
ELEVATOR CONSTRUCTOR	All	BLD		53.94	60.68	2.0	2.0	2.0	2.0	16.17	20.96	4.32	0.75		0.00	0.00			
GLAZIER	All	BLD		33.37	36.04	1.5	1.5	2.0	2.0	7.14	13.56	0.00	0.75	0.00	0.00	0.00			
HEAT/FROST INSULATOR	All	BLD		34.21	36.04	1.5	1.5	2.0	2.0	8.35	14.55	0.00	1.25	0.00	0.00	0.00			
IRON WORKER	All	ALL		37.50	40.50	1.5	1.5	2.0	2.0	12.87	17.40	0.00	0.72	0.00	0.00	0.00			
LABORER	All	BLD	1	28.56	30.84	1.5	1.5	2.0	2.0	7.60	15.70	0.00	0.80	0.00	0.00	0.00			
LABORER	All	BLD	2	30.06	32.46	1.5	1.5	2.0	2.0	7.60	15.70	0.00	0.80	0.00	0.00	0.00			
LABORER	All	BLD	3	30.71	33.17	1.5	1.5	2.0	2.0	7.60	15.70	0.00	0.80	0.00	0.00	0.00			
LABORER	All	HWY	1	33.77	36.47	1.5	1.5	2.0	2.0	7.60	15.20	0.00	0.80	0.00	0.00	0.00			
LABORER	All	HWY	2	34.27	37.01	1.5	1.5	2.0	2.0	7.60	15.20	0.00	0.80	0.00	0.00	0.00			
LABORER	All	HWY	3	34.90	37.69	1.5	1.5	2.0	2.0	7.60	15.20	0.00	0.80	0.00	0.00	0.00			
LATHER	All	BLD		33.50	35.18	1.5	1.5	2.0	2.0	10.32	17.28	0.00	0.82	0.00	0.00	0.00			
MACHINIST	All	BLD		58.39	62.39	1.5	1.5	2.0	2.0	9.93	8.95	1.85	1.47		0.00	0.00			

Rock Island County Prevailing Wage Rates posted on 9/16/2024

MARBLE FINISHER	ALL	BLD		26.73		1.5	1.5	2.0	2.0	12.45	8.35	0.00	0.47		0.00	0.00
MARBLE MASON	ALL	BLD		31.26	31.76	1.5	1.5	2.0	2.0	12.45	9.05	0.00	0.52		0.00	0.00
MILLWRIGHT	N	BLD		49.27	54.20	1.5	1.5	2.0	2.0	12.03	19.50	0.00	0.82	0.00	0.00	0.00
MILLWRIGHT	S	BLD		37.55	39.80	1.5	1.5	2.0	2.0	10.86	17.40	0.00	0.82	0.00	0.00	0.00
OPERATING ENGINEER	ALL	BLD	1	40.75	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	BLD	2	38.10	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	BLD	3	37.05	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	BLD	4	42.00	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	BLD	5	41.50	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	BLD	6	42.00	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	BLD	7	42.75	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	BLD	8	41.25	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	BLD	9	43.75	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	BLD	10	41.75	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	HWY	1	40.75	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	HWY	2	38.10	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	HWY	3	37.05	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	HWY	4	42.00	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	HWY	5	41.50	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	HWY	6	42.00	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	HWY	7	41.25	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	HWY	8	42.75	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	HWY	9	43.75	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
OPERATING ENGINEER	ALL	HWY	10	41.75	43.75	1.5	1.5	2.0	2.0	21.15	14.10	2.00	2.20	0.00	0.00	0.00
PAINTER	ALL	ALL		31.32	32.57	1.5	1.5	1.5	2.0	8.10	10.55	0.00	0.50		0.00	0.00
PAINTER OVER 30 FT.	ALL	ALL		33.32	34.57	1.5	1.5	1.5	2.0	8.10	10.55	0.00	0.50	0.00	0.00	0.00
PAINTER PWR EQMT	ALL	ALL		31.82	33.08	1.5	1.5	1.5	2.0	8.10	10.55	0.00	0.50	0.00	0.00	0.00
PILEDRIIVER	ALL	BLD		33.50	35.18	1.5	1.5	2.0	2.0	10.32	17.28	0.00	0.82	0.00	0.00	0.00
PILEDRIIVER	ALL	HWY		38.00	39.75	1.5	1.5	2.0	2.0	12.62	20.69	0.00	0.82	0.00	0.00	0.00
PIPEFITTER	ALL	ALL		44.80	49.28	1.5	1.5	2.0	2.0	8.15	16.15	0.00	1.65		0.00	0.00

Rock Island County Prevailing Wage Rates posted on 9/16/2024

PLASTERER	All	BLD		34.00	36.00	1.5	1.5	2.0	2.0	9.00	11.86	0.00	0.90		0.00	0.00
PLUMBER	All	ALL		44.80	49.28	1.5	1.5	2.0	2.0	8.15	16.15	0.00	1.65		0.00	0.00
ROOFER	All	BLD		35.52	37.52	1.5	1.5	2.0	2.0	12.14	9.95	0.00	1.29		0.00	0.00
SHEETMETAL WORKER	All	BLD		42.44	45.85	1.5	1.5	2.0	2.0	7.20	15.27	0.00	0.85		0.00	0.00
SPRINKLER FITTER	All	BLD		47.09	50.09	1.5	1.5	2.0	2.0	11.45	14.92	0.00	0.52		0.00	0.00
STONE MASON	All	BLD		34.78	36.28	1.5	1.5	2.0	2.0	12.45	10.35	0.00	0.97		0.00	0.00
TERRAZZO FINISHER	All	BLD		26.73		1.5	1.5	2.0	2.0	12.45	8.35	0.00	0.47		0.00	0.00
TERRAZZO MASON	All	BLD		31.26	31.76	1.5	1.5	2.0	2.0	12.45	9.05	0.00	0.52		0.00	0.00
TILE LAYER	All	BLD		33.50	35.18	1.5	1.5	2.0	2.0	10.32	17.28	0.00	0.82	0.00	0.00	0.00
TILE MASON	All	BLD		31.26	31.76	1.5	1.5	2.0	2.0	12.45	9.05	0.00	0.52		0.00	0.00
TRUCK DRIVER	All	ALL	1	43.31	47.67	1.5	1.5	2.0	2.0	16.27	8.04	0.00	0.25	0.00	0.00	0.00
TRUCK DRIVER	All	ALL	2	43.89	47.67	1.5	1.5	2.0	2.0	16.27	8.04	0.00	0.25	0.00	0.00	0.00
TRUCK DRIVER	All	ALL	3	44.21	47.67	1.5	1.5	2.0	2.0	16.27	8.04	0.00	0.25	0.00	0.00	0.00
TRUCK DRIVER	All	ALL	4	44.56	47.67	1.5	1.5	2.0	2.0	16.27	8.04	0.00	0.25	0.00	0.00	0.00
TRUCK DRIVER	All	ALL	5	45.67	47.67	1.5	1.5	2.0	2.0	16.27	8.04	0.00	0.25	0.00	0.00	0.00
TRUCK DRIVER	All	O&C	1	34.65	38.14	1.5	1.5	2.0	2.0	16.27	8.04	0.00	0.25	0.00	0.00	0.00
TRUCK DRIVER	All	O&C	2	35.11	38.14	1.5	1.5	2.0	2.0	16.27	8.04	0.00	0.25	0.00	0.00	0.00
TRUCK DRIVER	All	O&C	3	35.37	38.14	1.5	1.5	2.0	2.0	16.27	8.04	0.00	0.25	0.00	0.00	0.00
TRUCK DRIVER	All	O&C	4	35.65	38.14	1.5	1.5	2.0	2.0	16.27	8.04	0.00	0.25	0.00	0.00	0.00
TRUCK DRIVER	All	O&C	5	36.54	38.14	1.5	1.5	2.0	2.0	16.27	8.04	0.00	0.25	0.00	0.00	0.00
TUCKPINTER	All	BLD		34.78	36.28	1.5	1.5	2.0	2.0	12.45	10.35	0.00	0.97		0.00	0.00

Legend

Rg Region

Type Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers

C Class

Base Base Wage Rate

OT M-F Unless otherwise noted, OT pay is required for any hour greater than 8 worked each day, Mon through Fri. The number listed is the multiple of the base wage.

OT Sa Overtime pay required for every hour worked on Saturdays

OT Su Overtime pay required for every hour worked on Sundays

OT Hol Overtime pay required for every hour worked on Holidays

Rock Island County Prevailing Wage Rates posted on 9/16/2024

H/W Health/Welfare benefit
Vac Vacation
Trng Training

Other Ins Employer hourly cost for any other type(s) of insurance provided for benefit of worker.

Explanations ROCK ISLAND COUNTY

MILLWRIGHT (SOUTH) - South of Interstate 80.

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

Oil and chip resealing (O&C) means the application of road oils and liquid asphalt to coat an existing road surface, followed by application of aggregate chips or gravel to coated surface, and subsequent rolling of material to seal the surface.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER, MARBLE FINISHER, TERRAZZO FINISHER

Assisting, helping or supporting the tile, marble and terrazzo mechanic by performing their historic and traditional work assignments required to complete the proper installation of the work covered by said crafts. The term "Ceramic" is used for naming the classification only and is in no way a limitation of the product handled. Ceramic takes into consideration most hard tiles.

ELECTRONIC SYSTEMS TECHNICIAN

Installing, assembling and maintaining sound and intercom, protection alarm (security), master antenna television, closed circuit television, computer hardware and software programming and installation to the network's outlet and input (EXCLUDING all cabling, power and cable termination work historically performed by wiremen), door monitoring and control, nurse and emergency call programming and installation to the system's outlet and input (EXCLUDING all cabling, power and cable termination work historically performed by wiremen), clock and timing; and the installation and maintenance of transmit and receive antennas, transmitters, receivers, and associated apparatus which operates in conjunction with the above systems. All

Rock Island County Prevailing Wage Rates posted on 9/16/2024

work associated with these system installations will be included EXCEPT (1) installation of protective metallic conduit, excluding less than ten-foot runs strictly for protection of cable, and (2) 120 volt AC (or higher) power wiring and associated hardware.

LABORER - BUILDING

Class 1: General laborer, carpenter tender, tool cribman, salamander tender, flagman, form handler, floor sweeper, material handler, fencing laborer, cleaning lumber, landscaper, unloading explosives, laying of sod, planting/removal of trees, wrecking laborer, unloading of Re-Bars, scaffold worker, signal man on crane.

Class 2: Handling of materials treated with creosote, kettle men, prime mover or motorized unit used for wet concrete or handling of building materials, vibrator operator, motor mixer, power tools used under the jurisdiction of laborers, sand points, gunnite nozzle men, welders, cutters, burners and torchmen, chain saw operator, jackhammer and drill operators, paving breakers, air tamping hammerman, concrete saw operator, concrete burning machine operator, coring machine operator - hod carrier and plasterer tender.

Class 3: Caisson worker after 6 foot depth, dynamite man, asbestos abatement worker, tunnel miners - mixerman (plaster only), pump man.

LABORER - HEAVY & HIGHWAY

Class 1: Rod or chain man, flagman, dumpman, spotter, broom man, landscaper, planting and removal of trees, fencing laborers, dispatcher, ticket writer, scaleman, cleaning of forms or lumber (in bone yard), laying of sod, moving and/or maintenance of flares and barricades.

Class 2: Operation of all hand, electric, air, hydraulic or mechanically powered tools under the jurisdiction of Laborers' including jackhammers, tempers, air spades, augers, concrete saws, chain saws, utility saws, rock drills, vibrators, mortar mixer, power and hand saw (when clearing timber) general laborer (not elsewhere covered), craft-tender, material checker, material handler, form handler, concrete dumper, puddler, form setter helper, explosives handler, dynamite helper, center strip, reinforcing in concrete, wire mesh handler and installer, prime mover or any mechanical device taking the place of concrete buggy or wheelbarrow, sandpoint setter, asphalt kettleman. Sheet piling hammer drivers, laying and jointing of telephone conduit, gas distribution men, pipe setter on laterals, drain tiles, culvert pipe, and storm sewer catch basin leads, catch basins, manholes, batch dumpers, tank cleaners, cofferdam workers, bankman on floating plant, jointman with pipelayers. Back-up man (corker, joint maker) with pipe setter on sewer and water mains, batterboard man or laser operator on sewer and water main, labor in ditch, or tunnel, on sewer or water mains and telephone conduit. Cutters, burners, torchman, gravel box man, asphalt plant laborers, concrete plant laborer, deck hand, unloading of steel and rebar, laser beam operator, wrecking laborers.

Class 3: Asphalt raker or luteman, head form setter, head dynamite man (powderman) head string or wireline man (on paving), pipe setter on sewer or water main, gunnite nozzle man, asphalt or concrete curb machine operator, head grade man, head tunnel miner, concrete burning machine operator, coring machine operator, welder.

MATERIAL TESTER/INSPECTOR I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

Rock Island County Prevailing Wage Rates posted on 9/16/2024

MATERIAL TESTER/INSPECTOR II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEERS - BUILDING

Class 1. Shovel; Concrete Spreader; Dipper Dredge Crane man; Dual Purpose Truck (boom, Boom, Winch, etc.); Pile Driver; Boom Tractor or Side Boom; Trenching Machine (40 H.P. and over); Building Hoist (1, 2 or 3 drums); Cleaning and Priming Machine; Backfiller (throw bucket); Locomotive Engineer; Concrete Paver; Slip Form Paver; Caisson Augering Machines; Mucking Machine; Asphalt Heater-Planer Unit; Laser Screed; Pug Mill; Concrete Conveyor or Pump; Mechanical loaded Log Chippers or similar machines; Group Equipment Greaser; Off-Road Haul Units; Pipe Bending; Automatic Curbing Machines; Blastholer; Self-Propelled Rotary Drill or similar machines; Work Boat; Combination Concrete Finishing Machine and Float; Asphalt Paver Screed Operator; Forklift (6,000 lb. cap. or over or working heights 28 ft. and above); Chip Spreader; Straddle Carrier; Asphalt Paver; Asphalt Plant Operator; Boring Machine (Directional, Vertical, or Horizontal); Central Redi-Mix Plant Operator; Combination Backhoe Front End loader; Concrete Breaker or Hydro-Hammer (excluding walk-behinds); Concrete Wheel Saw (Large self-propelled - excluding walk-behinds); Crusher (Stone, Concrete, Asphalt, etc.); Curing-Tinning Machine; Excavator; Farm-type Tractor Operating Scoop or Scraper or with Power Attachment; Grader; Motor Grader; Motor Patrol; Auto Grader; Form Grader; Sub Grader; Elevating Grader; Guard Rail Post Driver; Hoists; Hydraulic Dredge Leverman or Engineer; Hydro-Vac truck mounted or pull type (excluding hose work), and similar equipment; Loader (Track, Rubber Tire, or Articulated); Milling Machine (excluding walk-behinds); Road Widener-Shoulder Spreader; Scraper (Self-Propelled); Self-Propelled Roller or Tire Roller (on asphalt or Blacktop); Sheep Foot or Pad Foot Compactor (excluding walk-behinds); Steel Track-Type Tractor (Dozer, Push Cat, etc.); Transfer or Shuttle Buggy (excluding motorized wheel barrows and Georgia buggies).

Class 2. Asphalt Booster; Fireman and Pump Operator at Asphalt Plant; Mud Jack; Distributor; Self-propelled Roller (other than provided for in Class 1); Pump Operator (more than one well-point pump); Trench Machine (under 40 H.P.); Forklift (less than 6,000 lb. cap. or working heights below 28 ft.); Gypsum Pump; Conveyor over 20 H.P.; Light Plant; Boiler (Engineer or Fireman); Mechanical Broom; Driver on Truck Crane or similar machines; Elevator (Permanent inside or Temporary outside); Farm-Type Tractor (without Power Attachment); Grout Pump (excluding hose work).

Class 3. Skid Loader; Oiler; Mechanic's Helper; Mechanical Heater (other than steam boiler); Small Outboard Motor Boat (Safety Boat and Life Boat); Engine Driven Welding Machine; Water Pumps; Air Compressor (400 c.f.m. or over); Deck Engineers.

Class 4. Leadman - Mechanic or Equipment Greaser.

Class 5. Track Excavator with Bucket (4 cubic yard and up to but not including 6 cubic yard).

Class 6. Track Excavator with Bucket (6 cubic yard and over).

Class 7. Crane (Friction or Hydraulic, regardless of size or attachments); Tow or Push Boat.

Class 8. Truck Mounted Concrete Conveyor or Pumps Extending to 90' or more.

Class 9. Crawler Crane

Rock Island County Prevailing Wage Rates posted on 9/16/2024

Class 10. Mechanic-Welder

OPERATING ENGINEERS- HIGHWAY

Class 1. Shovel; Concrete Spreader; Dipper Dredge Operator; Dipper Dredge Crane man; Dual Purpose Truck (Boom, Winch, etc.); Pile Driver; Boom Tractor or Side Boom; Building Hoist (1, 2 or 3 drums); Cleaning and Priming Machine; Backfiller (throw bucket); Locomotive Engineer; Concrete Paver; Slip Form Paver; Caisson Augering Machines; Mucking Machine; Asphalt Heater Planer Unit; Laser Screed; Pug Mill; Concrete Conveyor or Pump (excluding truck-mounted); Mechanical loaded Log Chippers or similar machines; Group Equipment Greaser; off-road haul units; Pipe Bending; Automatic Curbing Machines; Blastholer; Self-propelled Rotary Drill or similar machines; Work Boat; Combination Concrete Finishing Machine and Float; Asphalt Paver Screed Operator; Forklift (6,000 lb. cap. or over or working heights above 28 ft.); Chip Spreader; Asphalt Paver; Asphalt Plant Operator; Boring Machine (Directional, Vertical, or Horizontal); Central Redi-Mix Plant Operator; Combination Backhoe Front End loader; Concrete Breaker or Hydro-Hammer (excluding walk-behinds); Concrete Wheel Saw (Large self-propelled - excluding walk-behinds); Crusher (Stone, Concrete, Asphalt, etc.); Curing-Tinning Machine; Excavator; Farm-Type Tractor Operating Scoop or Scraper with Power Attachment; Grader; Motor Grader; Motor Patrol; Auto Grader; Form Grader; Pull Grader; Sub Grader; Elevating Grader; Guard Rail Post Driver; Hoists; Hydraulic Dredge Leverman or Engineer; Hydro-Vac truck mounted or pull type, and similar equipment; Loader (Track, Rubber Tire, or Articulated); Milling Machine (excluding walk-behinds); Road Widener-Shoulder Spreader; Scraper (self-propelled); Self-propelled Roller or Tire Roller (on asphalt or Blacktop); Sheep Foot or Pad Foot Compactor (excluding walk-behinds); Steel Track-Type Tractor (Dozer, Push Cat, etc.); Transfer or Shuttle Buggy (excluding motorized wheel barrows and Georgia buggies); Trenching Machine (40 H.P. and over).

Class 2. Asphalt Booster; Fireman and Pump Operator at Asphalt Plant; Mud Jack; Farm-Type Tractor without Power attachment; Distributor; Saddle Carrier; Self-propelled Roller or Compactor (other than provided for in Class 1); Pump Operator (more than one well-point pump); Trench Machine (under 40 H.P.); Forklift (less than 6,000 lb. capacity or working heights below 28 ft.); Conveyor over 20 H.P.; Air Compressor (400 c.f.m. or over); Light Plant; Boiler (Engineer or Fireman); Mechanical Broom; Driver on Truck Crane or similar machines; Elevator (Permanent inside or Temporary outside); Grout Pump (excluding hose work).

Class 3. Oiler; Mechanic's Helper; Mechanical Heater (other than steam boiler); Small Outboard Motor Boat (Safety Boat and Life Boat); Engine Driven Welding Machine; skid steer.

Class 4. Leadman - Mechanic or Equipment Greaser.

Class 5. Track Excavator with Bucket (4 cubic yard and up to but not including 6 cubic yard).

Class 6. Track Excavator with Bucket (6 cubic yard and over).

Class 7. Truck mounted Concrete Conveyor or Pumps Extending to 90 ft. or more.

Class 8. Crane (Friction or Hydraulic, regardless of size or attachments); Tow or Push Boat.

Class 9. Crawler Crane

Rock Island County Prevailing Wage Rates posted on 9/16/2024

Class 10. Mechanic-Welder

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION

Class 1. Drivers on 2 axle trucks hauling less than 9 ton. Air compressor and welding machines and brooms, including those pulled by separate units, truck driver helpers, warehouse employees, mechanic helpers, greasers and tiremen, pickup trucks when hauling materials, tools, or workers to and from and on-the-job site, and fork lifts up to 6,000 lb. capacity.

Class 2. Two or three axle trucks hauling more than 9 ton but hauling less than 16 ton. A-frame winch trucks, hydrolift trucks, vactor trucks or similar equipment when used for transportation purposes. Fork lifts over 6,000 lb. capacity, winch trucks, four axle combination units, and ticket writers.

Class 3. Two, three or four axle trucks hauling 16 ton or more. Drivers on water pulls, articulated dump trucks, mechanics and working forepersons, and dispatchers. Five axle or more combination units.

Class 4. Low Boy and Oil Distributors.

Class 5. Drivers who require special protective clothing while employed on hazardous waste work. TRUCK DRIVER - OIL AND CHIP RESEALING ONLY.

This shall encompass laborers, workers and mechanics who drive contractor or subcontractor owned, leased, or hired pickup, dump, service, or oil distributor trucks. The work includes transporting materials and equipment (including but not limited to, oils, aggregate supplies, parts, machinery and tools) to or from the job site; distributing oil or liquid asphalt and aggregate; stock piling material when in connection with the actual oil and chip contract. The Truck Driver (Oil & Chip Resealing) wage classification does not include supplier delivered materials.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

Rock Island County Prevailing Wage Rates posted on 9/16/2024

PROJECT MANUAL

**ROCK ISLAND CO MILAN FACILITY
FOR**

ROCK ISLAND COUNTY HIGHWAY DEPARTMENT

**SITE LOCATION:
851 10TH AVENUE WEST
MILAN, IL 61264**

**OWNER:
ROCK ISLAND COUNTY HIGHWAY DEPARTMENT
851 10TH AVENUE WEST
MILAN, IL 61264
309-787-4668**

**ARCHITECT, CIVIL & STRUCTURAL ENGINEER
WILLETT HOFMANN & ASSOCIATES
625 32ND AVENUE SW
CEDAR RAPIDS, IOWA 52404
319-378-1401**

**MECHANICAL, ELECTRICAL & PLUMBING ENGINEER
IMEG
623 26TH AVENUE
ROCK ISLAND, IL 61201
309-793-3404**

1854D23

TABLE OF CONTENTS

00001	PROJECT MANUAL TITLE PAGE
00005	CERTIFICATIONS PAGE
00010	TABLE OF CONTENTS

BIDDING DOCUMENTS, CONTRACT FORMS, AND CONDITIONS OF THE CONTRACT

00430	BID BOND
00500	AGREEMENT
00611	PERFORMANCE BOND
00612	PAYMENT BOND
00700	GENERAL CONDITIONS

TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

01100	SUMMARY OF WORK
01250	SUBSTITUTION PROCEDURES
01310	PROJECT MANAGEMENT AND COORDINATION
01330	SUBMITTAL PROCEDURES
01400	QUALITY REQUIREMENTS
01520	CONSTRUCTION FACILITIES
01600	PRODUCT REQUIREMENTS
01700	PROJECT CLOSEOUT
01732	CUTTING AND PATCHING

DIVISION 22 - PLUMBING

22 05 00	BASIC PLUMBING REQUIREMENTS
22 05 05	PLUMBING DEMOLITION FOR REMODELING
22 05 29	PLUMBING SUPPORTS AND ANCHORS
22 05 53	PLUMBING IDENTIFICATION
22 07 19	PLUMBING PIPING INSULATION
22 10 00	PLUMBING PIPING
22 10 30	PLUMBING SPECIALTIES
22 40 00	PLUMBING FIXTURES

DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING(HVAC)

23 05 00	BASIC HVAC REQUIREMENTS
23 05 05	HVAC DEMOLITION FOR REMODELING
23 05 29	HVAC SUPPORTS AND ANCHORS
23 05 53	HVAC IDENTIFICATION
23 05 93	TESTING, ADJUSTING, AND BALANCING
23 07 19	HVAC PIPING INSULATION
23 22 00	STEAM AND STEAM CONDENSATE PIPING
23 22 18	STEAM AND STEAM CONDENSATE SPECIALTIES
23 31 00	DUCTWORK
23 34 23	POWER VENTILATORS
23 37 00	AIR INLETS AND OUTLETS
23 82 00	TERMINAL HEAT TRANSFER UNITS

DIVISION 26 - ELECTRICAL

26 05 00	BASIC ELECTRICAL REQUIREMENTS	38
26 05 05	ELECTRICAL DEMOLITION FOR REMODELING	4
26 05 13	WIRE AND CABLE	13
26 05 26	GROUNDING AND BONDING	12
26 05 27	SUPPORTING DEVICES	5
26 05 33	CONDUIT AND BOXES	23
26 05 53	ELECTRICAL IDENTIFICATION	20
26 09 33	LIGHTING CONTROL SYSTEMS	52
26 27 26	WIRING DEVICES	35
26 51 19	LED LIGHTING	13

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

28 31 00	FIRE ALARM AND DETECTION SYSTEMS	52

GENERAL CONSTRUCTION, MECHANICAL AND ELECTRICAL WORK TECHNICAL SPECIFICATIONS, INCLUDING ARCHITECTURAL AND STRUCTURAL MATERIALS, ARE CONTAINED ON THE DRAWINGS.

DOCUMENT 00005
CERTIFICATIONS PAGE

I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly Licensed Architect under the laws of the State of Illinois. My License Renewal Date is 11/30/2024.

John Gabrielson

John Paul M. Gabrielson, AIA
Illinois License No. 001024643

2024.10.21

Date



Peter Courtney

Peter Courtney, P.E.
Illinois License No. 062-071353

2024.10.21

Date



Matthew D. Snyder

Matthew D. Snyder, P.E.
Illinois License No. 062-061824

2024.10.21

Date



END OF DOCUMENT 00005

DOCUMENT 00430
BID BOND

1. BID BOND

- A. Where it is provided in the Instructions to Bidders that the Bidder may submit a bid bond as the bid security, the Bidder may use AIA Document A310 "Bid Bond." AIA Document A310 is hereby made a part of these Documents to the same extent as if bound herein. This form can be purchased from the American Institute of Architects state office or from the Architect/Engineer at cost.

END OF DOCUMENT 00430

DOCUMENT 00500
AGREEMENT

1. AGREEMENT

- A. AIA Document A101 "Standard Form of Agreement between Owner and Contractor" where the basis of payment is a stipulated Sum (2017 Edition) forms the basis of the contract between the Owner and Contractor and is hereby made a part of these Documents to the same extent as if bound herein. All provisions that are not amended or supplemented remain in full force and effect.

END OF DOCUMENT 00500

DOCUMENT 00611
PERFORMANCE BOND

1. PERFORMANCE BOND

- A. AIA Document A312-2010 "Performance Bond" is hereby made a part of these Documents to the same extent as if bound herein. All provisions that are not amended or supplemented remain in full force and effect.

END OF DOCUMENT 00611

DOCUMENT 00612
PAYMENT BOND

1. PAYMENT BOND

- A. AIA Document A312-2010 "Payment Bond" is hereby made a part of these Documents to the same extent as if bound herein. All provisions that are not amended or supplemented remain in full and extent.

END OF DOCUMENT 00612

DOCUMENT 00700
GENERAL CONDITIONS

I. GENERAL CONDITIONS

- A. AIA Document A201 "General Conditions of the Contract for Construction" (2017 Edition), is the General Conditions between the Owner and Contractor and is hereby made a part of these Documents to the same extent as if bound herein. The document can be purchased from the American Institute of Architects state office or obtained from the Architect/Engineer.

II SUPPLEMENTARY CONDITIONS

- A. Refer to Document 00800, Supplementary Conditions, for amendments to these General Conditions.

END OF DOCUMENT 00700

SECTION 01100 SUMMARY OF WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Description:

This Project involves the renovation of three restrooms and an addition to the Maintenance Building and associated site work for Rock Island County Highway Department, Milan, Illinois.

1.02 WORK BY OWNER

A. The Owner may award contracts or undertake the supply and installation of materials and equipment that may be done concurrent with this construction.

B. Items also noted NIC (Not-In-Contract), will be supplied and installed by Owner.

1.03 OWNER SUPPLIED PRODUCTS

A. Owner's Responsibilities:

1. Arrange for and deliver Owner reviewed Shop Drawings, Product Data, and Samples, to Contractor.
2. Arrange and pay for Product delivery to site.
3. On delivery, inspect Products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
5. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:

1. Review Owner reviewed Shop Drawings, Product Data, and Samples.
2. Receive and unload Products at site; inspect for completeness or damage, jointly with Owner.
3. Handle, store, install and finish Products.
4. Repair or replace items damaged after receipt.

C. The following abbreviations are utilized in the Contract Documents:

1. OFOI - Owner Furnished Owner Installed.
2. OFCI - Owner Furnished Contractor Installed.

1.04 CONTRACTOR USE OF SITE AND PREMISES

A. Access to Site: Contractor's access to the areas can start immediately.

B. Site and Facility Egress must be kept open for the Owner during construction.

C. Construction Operations: Limited to areas noted on Drawings.

C. Utility Outages and Shutdown: It is absolutely required that these be coordinated with Owner prior to implementation.

SECTION 01100
SUMMARY OF WORK

1.05 WORK SEQUENCE

- A. Construct Work as shown on the contract documents to accommodate Owner will be occupying the Shower house during the construction period. Coordinate construction schedule and operations with both the Owner and Architect/Engineer.

1.06 OWNER OCCUPANCY

- A. The Owner will occupy the adjacent existing Shower house building during the period of construction.
- B. Schedule the Work to accommodate this requirement.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION 01100

SECTION 01250
SUBSTITUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance.
- B. Product options.
- C. Product substitution procedures.

1.2 QUALITY ASSURANCE

- A. Contract is based on products and standards established in Contract Documents without consideration of proposed substitutions.
- B. Products specified define standard of quality, type, function, dimension, appearance, and performance required.
- C. Substitution Proposals: Permitted for specified products except where specified otherwise. Do not substitute products unless substitution has been accepted and approved in writing by Owner.

1.3 PRODUCT OPTIONS

- A. See Section 01 60 00 - Product Requirements.

1.4 PRODUCT SUBSTITUTION PROCEDURES

- A. Architect/Engineer will consider requests for substitutions only within 15 days after date of Owner-Contractor Agreement.
- B. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.
- C. Document each request with complete data, substantiating compliance of proposed substitution with Contract Documents, including:
 - 1. Manufacturer's name and address, product, trade name, model, or catalog number, performance and test data, and reference standards.
 - 2. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, performance, and other pertinent characteristics.
 - 3. Reference to Article and Paragraph numbers in Specification Section.
 - 4. Cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.
 - 5. Changes required in other Work.

SECTION 01250
SUBSTITUTION REQUIREMENTS

6. Availability of maintenance service and source of replacement parts as applicable.
7. Certified test data to show compliance with performance characteristics specified.
8. Samples when applicable or requested.
9. Other information as necessary to assist Architect/Engineer's evaluation.

D. A request constitutes a representation that Bidder or Contractor:

1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
2. Will provide same warranty for substitution as for specified product.
3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Will coordinate installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
6. Will reimburse Owner and Architect/Engineer for review or redesign services associated with reapproval by authorities having jurisdiction.

E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals without separate written request or when acceptance will require revision to Contract Documents.

F. Substitution Submittal Procedure:

1. Submit requests for substitutions on form attached to end of this Section.
2. Submit three copies of Request for Substitution for consideration. Limit each request to one proposed substitution.
3. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
4. Architect/Engineer will notify Contractor in writing of decision to accept or reject request.

1.5 INSTALLER SUBSTITUTION PROCEDURES

A. Architect/Engineer will consider requests for substitutions only within 15 days after date of Owner-Contractor Agreement.

B. Document each request with:

1. Installer's qualifications.
2. Installer's experience in work similar to that specified.
3. Other information as necessary to assist Architect/Engineer's evaluation.

C. Substitution Submittal Procedure:

1. Submit three copies of Request for Substitution for consideration. Limit each request to one proposed substitution.
2. Architect/Engineer will notify Contractor in writing of decision to accept or reject request.

SECTION 01250
SUBSTITUTION REQUIREMENTS



**SUBSTITUTION
REQUEST**

(After the Bidding/Negotiating Phase)

Project: _____ Substitution Request Number: _____

From: _____
To: _____ Date: _____

A/E Project Number: _____
Re: _____ Contract For: _____

Specification Title: _____ Description: _____
Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____
Trade Name: _____ Model No.: _____
Installer: _____ Address: _____ Phone: _____

History: ☐ New product ☐ 1-4 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____

☐ Point-by-point comparative data attached — REQUIRED BY A/E

Reason for not providing specified item: _____

Similar Installation:

Project: _____ Architect: _____
Address: _____ Owner: _____
_____ Date Installed: _____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes; explain _____

Savings to Owner for accepting substitution: _____ (\$ _____).

Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days.

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

SECTION 01250
SUBSTITUTION REQUIREMENTS

**SUBSTITUTION
REQUEST**

(After the Bidding/Negotiating Phase — Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____

Attachments: ☐

A/E's REVIEW AND RECOMMENDATION

- ☐ Approve Substitution - Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures.
- ☐ Approve Substitution as noted - Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures.
- ☐ Reject Substitution - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

OWNER'S REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures. Prepare Change Order.
- ☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures. Prepare Change Order.
- ☐ Substitution rejected - Use specified materials.

Signed by: _____ Date: _____

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ A/E

SECTION 01250
SUBSTITUTION REQUIREMENTS

PART 3 - EXECUTION - Not Used

END OF SECTION 01 25 00

SECTION 01310
PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Coordination.
- B. Pre-construction Meeting
- C. Progress Meetings.
- D. Pre-installation Meetings.

1.02 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various sections of the Contract Documents to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and clean up of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy.
- F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.03 PRECONSTRUCTION MEETING

- A. Owner and Architect/Engineer will schedule a meeting after Notice of Award.
- B. Attendance Required: Owner, Architect/Engineer, Contractor, and major subcontractors (mechanical and electrical).
- C. Agenda:
 - 1. Distribution of Contract Documents.

SECTION 01310
PROJECT MANAGEMENT AND COORDINATION

2. Requirements and schedule for Contractor's submission of list of Subcontractors, list of Products, schedule of values, project schedule, bonds and insurance certificates.
3. Designation of responsible personnel representing the Owner, the Contractor, and the Architect/Engineer.
4. Review construction schedule:
 - Official contract start date
 - Substantial completion deadline
 - Final completion deadline
 - Critical dates during Construction
 - Equipment deliveries and priorities
 - Critical Work sequencing
5. Procedures and processing of
 - Field decisions
 - Shop Drawings
 - Product Data
 - Samples
 - Substitutions
 - Applications for payment
 - Change Orders
 - Contract close out
6. Use of premises by Owner and Contractor.
7. Requirements and procedures for testing.
8. Scheduling activities of a Geo-technical Engineer and other testing Personnel.
9. Survey and building layout.
10. Safety.
11. Security.
12. Contractor's field office.
13. Housekeeping.
14. Working hours.
15. Construction facilities and controls provided by Owner.
16. Temporary utilities provided by Owner.
17. Procedures for maintaining record documents.
18. Requirements for start-up of equipment.
19. Review and acceptance of equipment put into service during construction period.
20. Other items of discussion.

1.04 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work at maximum bi-weekly (every two weeks) intervals.
- B. Make arrangements for meetings and prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required Job superintendent, major Subcontractors and suppliers, Owner, and Architect/Engineer, as appropriate to agenda topics for each meeting.
- D. Agenda:
 1. Review minutes of previous meetings.
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems that impede planned progress.

SECTION 01310
PROJECT MANAGEMENT AND COORDINATION

5. Review of submittals schedule and status of submittals.
 6. Review of off-site fabrication and delivery schedules.
 7. Maintenance of progress schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Coordination of projected progress.
 11. Maintenance of quality and work standards.
 12. Effect of proposed changes on progress schedule and coordination.
 13. Other business relating to work.
- E. Record minutes and distribute copies within two days after meeting to participants, with one copy to each to the Architect/Engineer and Owner and other participants, and those affected by decisions made.

1.05 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a pre-installation meeting at work site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Owner and Architect/Engineer four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
1. Review conditions of installation, preparation and installation procedures.
 2. Review coordination with related work.
 3. Review existing building conditions on the exterior and interior.
- E. Record minutes and distribute copies within two days after meeting to participants, with one copy each to Architect/Engineer, Owner, and other participants, and those affected by decisions made.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION 01310

SECTION 01330
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Definitions.
- B. Submittal procedures.
- C. Construction progress schedules.
- D. Proposed product list.
- E. Product data.
- F. Use of electronic CAD files of Project Drawings.
- G. Shop Drawings.
- H. Samples.
- I. Other submittals.
- J. Design data.
- K. Test reports.
- L. Certificates.
- M. Manufacturer's instructions.
- N. Manufacturer's field reports.
- O. Erection Drawings.
- P. Construction photographs.
- Q. Contractor review.
- R. Architect/Engineer review.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect/Engineer's responsive action.
- B. Informational Submittals: Written and graphic information and physical Samples that do not require Architect/Engineer's responsive action. Submittals may be rejected for not complying with requirements.

SECTION 01330
SUBMITTAL PROCEDURES

1.3 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Architect/Engineer-accepted form.
- B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- C. Identify: Project, Contractor, Subcontractor and supplier, pertinent Drawing and detail number, and Specification Section number appropriate to submittal.
- D. Apply Contractor's stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is according to requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite Project and deliver to Architect/Engineer at business address and submit electronic submittals via email as PDF electronic files. Coordinate submission of related items.
- F. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.
- G. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.
- H. Allow space on submittals for Contractor and Architect/Engineer review stamps.
- I. When revised for resubmission, identify changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- K. Submittals not requested will not be recognized nor processed.
- L. Incomplete Submittals: Architect/Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of Architect/Engineer.

1.4 CONSTRUCTION PROGRESS SCHEDULES

- A. Comply with Section 01 32 16 - Construction Progress Schedule

1.5 PROPOSED PRODUCT LIST

- A. Within 15 days after date of Owner-Contractor Agreement, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

SECTION 01330
SUBMITTAL PROCEDURES

1.6 PRODUCT DATA

- A. Product Data: Action Submittal: Submit to Architect/Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Submit electronic submittals via email as PDF electronic files.
- C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.7 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

- A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.
- B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
 - 1. Use of files is solely at receiver's risk. Architect/Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Architect/Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
 - 2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
 - 3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
 - 4. Receiver shall not hold Architect/Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
 - 5. Receiver shall understand that even though Architect/Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
 - 6. Receiver shall not hold Architect/Engineer responsible for such viruses or their consequences, and shall hold Architect/Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.

SECTION 01330
SUBMITTAL PROCEDURES

1.8 SHOP DRAWINGS

- A. Shop Drawings: Action Submittal: Submit to Architect/Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a professional Engineer responsible for designing components shown on Shop Drawings.
 - 1. Include signed and sealed calculations to support design.
 - 2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
 - 3. Make revisions and provide additional information when required by authorities having jurisdiction.
- D. Submit electronic submittals via email as PDF electronic files.
- E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.9 SAMPLES

- A. Samples: Action Submittal: Submit to Architect/Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Samples for Selection as Specified in Product Sections:
 - 1. Submit to Architect/Engineer for aesthetic, color, and finish selection.
 - 2. Submit Samples of finishes, textures, and patterns for Architect/Engineer selection.
- C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.
- D. Include identification on each Sample, with full Project information.
- E. Submit number of Samples specified in individual Specification Sections; Architect/Engineer will retain one Sample.
- F. Reviewed Samples that may be used in the Work are indicated in individual Specification Sections.
- G. Samples will not be used for testing purposes unless specifically stated in Specification Section.
- H. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

SECTION 01330
SUBMITTAL PROCEDURES

1.10 OTHER SUBMITTALS

- A. Closeout Submittals: Comply with Section 01 70 00 - Execution and Closeout Requirements.
- B. Informational Submittal: Submit data for Architect/Engineer's knowledge as Contract administrator or for Owner.
- C. Submit information for assessing conformance with information given and design concept expressed in Contract Documents.

1.11 TEST REPORTS

- A. Informational Submittal: Submit reports for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit test reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.12 CERTIFICATES

- A. Informational Submittal: Submit certification by manufacturer, installation/application Subcontractor, or Contractor to Architect/Engineer, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product but must be acceptable to Architect/Engineer.

1.13 MANUFACTURER'S INSTRUCTIONS

- A. Informational Submittal: Submit manufacturer's installation instructions for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit printed instructions for delivery, storage, assembly, installation, [startup,] adjusting, and finishing, to Architect/Engineer in quantities specified for Product Data.
- C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.14 MANUFACTURER'S FIELD REPORTS

- A. Informational Submittal: Submit reports for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit report within 5 days of observation to Architect/Engineer for information.

SECTION 01330
SUBMITTAL PROCEDURES

- C. Submit reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.15 ERECTION DRAWINGS

- A. Informational Submittal: Submit Drawings for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit Drawings for information assessing conformance with information given and design concept expressed in Contract Documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by Architect/Engineer or Owner.

1.16 CONTRACTOR REVIEW

- A. Review for compliance with Contract Documents and approve submittals before transmitting to Architect/Engineer.
- B. Contractor: Responsible for:
 - 1. Determination and verification of materials including manufacturer's catalog numbers.
 - 2. Determination and verification of field measurements and field construction criteria.
 - 3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.
 - 4. Determination of accuracy and completeness of dimensions and quantities.
 - 5. Confirmation and coordination of dimensions and field conditions at Site.
 - 6. Construction means, techniques, sequences, and procedures.
 - 7. Safety precautions.
 - 8. Coordination and performance of Work of all trades.
- C. Stamp, sign or initial, and date each submittal to certify compliance with requirements of Contract Documents.
- D. Do not fabricate products or begin Work for which submittals are required until approved submittals have been received from Architect/Engineer.

1.17 ARCHITECT/ENGINEER REVIEW

- A. Do not make "mass submittals" to Architect/Engineer. "Mass submittals" are defined as six or more submittals or items in one day or 20 or more submittals or items in one week. If "mass submittals" are received, Architect/Engineer's review time stated above will be extended as necessary to perform proper review. Architect/Engineer will review "mass submittals" based on priority determined by Architect/Engineer after consultation with Owner and Contractor.
- B. Informational submittals and other similar data are for Architect/Engineer's information, do not require Architect/Engineer's responsive action, and will not be reviewed or returned with comment.

SECTION 01330
SUBMITTAL PROCEDURES

- C. Submittals made by Contractor that are not required by Contract Documents may be returned without action.
- D. Submittal approval does not authorize changes to Contract requirements unless accompanied by Change Order, Architect's Supplemental Instruction, Field Order, or Construction Change Directive.
- E. Owner may withhold monies due to Contractor to cover additional costs beyond the second submittal review.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 01 33 00

SECTION 01400
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality control.
- B. Tolerances.
- C. References.
- D. Labeling.

1.2 QUALITY CONTROL

- A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with specified standards as the minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- C. Perform Work using persons qualified to produce required and specified quality.
- D. Products, materials, and equipment may be subject to inspection by Architect/Engineer and Owner at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.
- E. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

1.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

SECTION 01400
QUALITY REQUIREMENTS

1.4 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current as of date of Contract Documents except where specific date is established by code.
- C. Obtain copies of standards and maintain on Site when required by product Specification Sections.
- D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- E. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Architect/Engineer shall be altered from Contract Documents by mention or inference in reference documents.

1.5 LABELING

- A. Attach label from agency approved by authorities having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.
- B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:
 - 1. Model number.
 - 2. Serial number.
 - 3. Performance characteristics.
- C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

END OF SECTION 01400

SECTION 01520
CONSTRUCTION FACILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary Utilities: Electricity, ventilation, water, and sanitary facilities.
- B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, and water control.
- C. Construction Facilities: Access to site, progress cleaning, and loud construction work.

1.02 TEMPORARY ELECTRICITY

- A. Cost: By Owner; connect to Owner's existing power service. Do not disrupt Owner's need for continuous service. Owner will pay cost of energy used. Exercise measures to conserve energy.
- B. Provide temporary electric feeder from existing site electrical service at location as directed. Do not disrupt Owner's need for continuous service.
- C. Complement existing power service capacity and characteristics as required.
- D. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
- E. Provide main service disconnect and over-current protection at convenient location.
- F. Permanent convenience receptacles may not be utilized during construction, except as approved by Owner's representatives.

1.03 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Utilize existing ventilation equipment where applicable. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.04 TEMPORARY WATER SERVICE

- A. Connect to existing water source for construction operations.
- B. Owner will pay cost of water used. Exercise measures to conserve water.
- C. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

1.05 TEMPORARY SANITARY FACILITIES

- A. General Contractor to provide temporary sanitation facilities for employees.

SECTION 01520 CONSTRUCTION FACILITIES

1.06 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction staging areas to allow for Owner's use of site to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing adjacent areas of the building.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.07 INTERIOR ENCLOSURES

- A. Provide temporary partitions as required to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.
- B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

1.08 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

1.09 SECURITY

- A. Provide security and facilities to protect Work, and existing facilities and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner's security program.

1.10 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust.
- C. Collect and remove waste materials, debris, and rubbish from site periodically and dispose off-site.

SECTION 01520
CONSTRUCTION FACILITIES

1.11 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials prior to Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1.12 SITE ACCESS: The contractor shall have continuous access on the site for material and personnel movement to the site. The contractor shall protect all existing facilities elsewhere on the site with blankets, boards, and other methods and as acceptable to the Owner. Remove all protective materials following completion of the project. Coordinate all parking and access routes and protective methods with the Owner prior to starting the work.

1.13 The contractor shall defer loud demolition work to hours either preceding or following normal business hours. Coordinate with the Owner's representative.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION 01520

SECTION 01600
PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Equipment electrical characteristics and components.

1.2 PRODUCTS

- A. At minimum, comply with specified requirements and reference standards.
- B. Specified products define standard of quality, type, function, dimension, appearance, and performance required.
- C. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.
- D. Domestic Products: Except where specified otherwise, domestic products are required and interpreted to mean products mined, manufactured, fabricated, or produced in United States or its territories.
- E. Do not use materials and equipment removed from existing premises except as specifically permitted by Contract Documents.
- F. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Comply with delivery requirements in Section 01 74 19 - Construction Waste Management and Disposal.
- B. Transport and handle products according to manufacturer's instructions.
- C. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

SECTION 01600
PRODUCT REQUIREMENTS

- D. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products according to manufacturer's instructions.
- B. Store products with seals and labels intact and legible.
- C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.
- D. For exterior storage of fabricated products, place products on sloped supports aboveground.
- E. Provide bonded off-Site storage and protection when Site does not permit on-Site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Products complying with specified reference standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and complying with Specifications; no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit Request for Substitution for any manufacturer not named, according to Section 01 25 00 - Substitution Procedures.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 01 60 00

SECTION 01700
PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 SUBSTANTIAL COMPLETION

- A. Contractor:
 - 1. Submit written certification to Architect that project, or designated portion of project, is substantially complete.
 - 2. Submit list of major items to be completed or corrected.
- B. Architect will make an observation within seven days after receipt of certification together with Owner's representative.
- C. Should Architect consider that work is substantially complete:
 - 1. Architect shall prepare an amended list of items to be completed or corrected as determined by the inspection.
 - 2. Architect will prepare and issue a Certificate of Substantial Completion containing:
 - a. Date of substantial completion.
 - b. Amended list of items to be completed or corrected.
 - c. Time schedule to complete or correct work.
 - d. Time and date Owner will assume possession of work or designated portion thereof.
 - e. Signatures of:
 - (1) Architect.
 - (2) Contractor.
 - (3) Owner.
- D. Should Architect consider that work is not substantially complete:
 - 1. Architect shall notify Contractor in writing stating reasons.
 - 2. Contractor shall complete work and send second written notice to Architect certifying that project, or designated portion of project, is substantially complete.
 - 3. Architect will re-observe work.

1.02 FINAL INSPECTION

- A. Contractor shall submit written certification that:
 - 1. Contract documents have been reviewed.
 - 2. Project has been inspected for compliance with contract documents.

SECTION 01700
PROJECT CLOSEOUT

3. Work has been completed in accordance with contract documents.
 4. Equipment and systems have been tested in the presence of Owner's representative and are operational.
 5. Project is completed and ready for final inspection.
- B. Architect will make final observation within seven days after receipt of certification.
- C. Should Architect consider that work is finally complete in accordance with requirements of contract documents, he shall request Contractor to make project closeout submittals.
- D. Should Architect consider that work is still not finally complete:
1. He shall notify Contractor in writing stating reasons.
 2. Contractor shall take immediate steps to remedy the stated deficiencies and send second written notice to Architect certifying that work is complete.
 3. Architect will re-observe work.

1.03 RE-OBSERVATION COSTS

- A. Should Architect be required to perform second observation because of failure of work to comply with original certifications of Contractor, Owner will compensate Architect for additional services and deduct amount paid from final payment to Contractor.

1.04 CLOSEOUT SUBMITTALS

- A. Project record documents: Provide one set of marked-up documents showing any changes from original design done during construction.
- B. Guarantees and Bonds specified in General Conditions.

1.05 INSTRUCTION

- A. Instruct Owner's personnel in operation of all systems, mechanical, electrical and other equipment.

1.06 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS

- A. Submit the following documents before final payment is made:
1. Contractor's release or waiver of liens.
 2. Separate releases or waivers of liens for subcontractors, suppliers and others with lien rights against property of Owner together with list of those parties.
- B. All submittals shall be duly executed before delivery to Architect.

SECTION 01700
PROJECT CLOSEOUT

1.07 FINAL APPLICATION FOR PAYMENT

- A. Contractor shall submit final application in accordance with requirements of General and Supplementary Conditions.
- B. Architect will issue final certificate in accordance with provisions of General Conditions.
- C. Should final completion be materially delayed through no fault of Contractor, Architect may issue a Semi-final Certificate of Payment, in accordance with provisions of General Conditions.

1.08 POST-CONSTRUCTION OBSERVATION

- A. Prior to expiration of one year from date of substantial completion, Architect may make visual observation of project in company with Owner and Contractor to determine whether correction of work is required in accordance with provisions of General Conditions.
- B. For guarantees beyond one year, Architect will make observations at request of Owner after notification to Contractor.
- C. Architect will promptly notify Contractor in writing of any observed deficiencies.

END OF SECTION 01700

SECTION 01732 CUTTING AND PATCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Administrative and procedural requirements for cutting and patching.

1.02 SUBMITTALS

- A. Submit written request in advance of cutting or altering elements which affect:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Visual qualities of sight-exposed elements.
 - 5. Work of Owner or separate Contractor.

1.03 QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
- B. Operational and Safety Limitations: Do not cut and patch operating elements or safety-related components in a manner that would result in reducing their capacity to perform as intended, or results in increased maintenance, or decreased operational life or safety.
- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Architect/Engineer's judgment, reduce the building's aesthetic qualities or result in visual evidence of cutting or patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will be equivalent to or surpass that of existing materials.

PART 3 EXECUTION

3.01 INSPECTION

- A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

3.02 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching, to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

SECTION 01732 CUTTING AND PATCHING

- C. Avoid interference with use of adjoining areas of interruption of free passage to adjoining areas.
- D. Take precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 PERFORMANCE

- A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
- B. Cut existing construction only where required to provide for installation of other components or performance of other construction activities, and perform the subsequent fitting and patching required to restore surfaces to their original condition.
- C. Execute cutting, fitting and patching including excavation and fill to complete Work, and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and non-conforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute Work by methods which will avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- E. Cut masonry and concrete materials using masonry saw or core drill.
- F. Restore Work with new Products in accordance with requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; seal voids.
- I. Identify any hazardous substance or condition exposed during the Work to the Architect/Engineer for decision or remedy.
- J. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
- K. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken portion containing the patch, after the patched area has received primer and second coat.

3.04 CLEANING

- A. Clean areas and spaces where cutting and patching is performed or used as access. Remove paint, mortar, oils, putty and items of similar nature. Clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 01732

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

SECTION 22 05 00 - BASIC PLUMBING REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Requirements applicable to all Division 22 Sections. Also refer to Division 1 - General Requirements.
- B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 SCOPE OF WORK

- A. This Specification and the associated drawings govern the furnishing, installing, testing and placing into satisfactory operation the Mechanical Systems.
- B. Each Contractor shall provide all new materials indicated on the drawings and/or in these specifications, and all items required to make the portion of the Mechanical Work a finished and working system.
- C. All work will be awarded under a single General Contract. The division of work listed below is for the Contractor's convenience and lists normal breakdown of the work.

D. Scope of Work:

- 1. Plumbing Work shall include, but is not necessarily limited to:
 - a. Furnish and install all items listed in the Plumbing Material List.
 - b. Extend existing domestic water piping system including cold, hot, and hot water circulating piping within the building. Insulate all piping as specified.
 - c. Extend existing sanitary sewer and vent system.
 - d. Furnish and install sanitary sewage ejector basins and pumps.
 - e. Furnish and install firestopping systems for penetrations of fire-rated construction associated with this Contractor's work.
 - f. Complete all applicable tests, certifications, forms, and matrices.
- 2. Heating Work: Refer to Section 23 05 00 "Basic HVAC Requirements".
- 3. Air Conditioning and Ventilating Work: Refer to Section 23 05 00 "Basic HVAC Requirements".
- 4. Temperature Control Work: Refer to Section 23 05 00 "Basic HVAC Requirements".
- 5. Fire Protection Work: Refer to Section 21 05 00 "Basic Fire Suppression Requirements".
- 6. Testing, Adjusting, and Balancing Work: Refer to Section 23 05 00 "Basic HVAC Requirements".

1.3 OWNER FURNISHED PRODUCTS

- A. The Owner will supply manufacturer's installation data for Owner-purchased equipment for this project.
- B. This Contractor shall make all plumbing system connections shown on the drawings or as required for fully functional units.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

- C. This Contractor is responsible for all damage to Owner furnished equipment caused during installation.

1.4 WORK SEQUENCE

- A. All work that will produce excessive noise or interference with normal building operations, as determined by the Owner, shall be scheduled with the Owner. It may be necessary to schedule such work during unoccupied hours. The Owner reserves the right to determine when restricted construction hours will be required.
- B. Itemize all work and list associated hours and pay scale for each item.

1.5 DIVISION OF WORK BETWEEN MECHANICAL, ELECTRICAL & CONTROL CONTRACTORS

A. Definitions:

1. "Mechanical Contractors" refers to the following:
 - a. Plumbing Contractor.
 - b. Heating Contractor.
 - c. Air Conditioning and Ventilating Contractor.
 - d. Temperature Control Contractor.
 - e. Fire Protection Contractor.
 - f. Testing, Adjusting, and Balancing Contractor.
2. Motor Control Wiring: The wiring associated with the remote operation of the magnetic coils of magnetic motor starters or relays, or the wiring that permits direct cycling of motors by means of devices in series with the motor power wiring. In the latter case the devices are usually single phase and are usually connected to the motor power wiring through a manual motor starter having "Manual-Off-Auto" provisions.
3. Control devices such as start-stop push buttons, thermostats, pressure switches, flow switches, relays, etc., generally represent the types of equipment associated with motor control wiring.
4. Motor control wiring is single phase and usually 120 volts. In some instances, the voltage will be the same as the motor power wiring. Generally, where the motor power wiring exceeds 120 volts, a control transformer is used to give a control voltage of 120 volts.
5. Temperature Control Wiring: The wiring associated with the operation of a motorized damper, solenoid valve or motorized valve, etc., either modulating or two-position, as opposed to wiring which directly powers or controls a motor used to drive equipment such as fans, pumps, etc.
 - a. This wiring will be from a 120 volt source and may continue as 120 volt, or be reduced in voltage (24 volt) in which case a control transformer shall be furnished as part of the temperature control wiring.
6. Control Motor: An electric device used to operate dampers, valves, etc. It may be two-position or modulating. Conventional characteristics of such a motor are 24 volts, 60 cycles, 1 phase, although other voltages may be encountered.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

7. Voltage is generally specified and scheduled as distribution voltage. Motor submittals may be based on utilization voltage if it corresponds to the correct distribution voltage.

Distribution/Nominal Voltage	Utilization Voltage
120	115
208	200
240	230
277	265
480	460

B. General:

1. The purpose of these Specifications is to outline the Electrical and Mechanical Contractor's responsibilities related to electrical work required for items such as temperature controls, mechanical equipment, fans, chillers, compressors and the like. The exact wiring requirements for much of the equipment cannot be determined until the systems have been selected and submittals reviewed. Therefore, the electrical drawings show only known wiring related to such items. All wiring not shown on the electrical drawings, but required for mechanical systems, is the responsibility of the Mechanical Contractor.
2. Where the drawings require the Electrical Contractor to wire between equipment furnished by the Mechanical Contractor, such wiring shall terminate at terminals provided in the equipment. The Mechanical Contractor shall provide complete electrical power/controls wiring diagrams and supervision to the Electrical Contractor and designate the terminal numbers for correct wiring.
3. All electrical work shall conform to the National Electrical Code. All provisions of the Electrical Specifications concerning wiring, protection, etc., apply to wiring provided by the Mechanical Contractor unless noted otherwise.
4. Control low (24V) and control line (120V) voltage wiring, conduit, and related switches and relays required for the automatic control and/or interlock of motors and equipment, including final connection, are to be furnished and installed under Divisions 21, 22 and 23. Materials and installation to conform to Class 1 or 2 requirements.
5. All Contractors shall establish utility elevations prior to fabrication and shall coordinate their material and equipment with other trades. When a conflict arises, priority is as follows:
 - a. Light fixtures.
 - b. Gravity flow piping, including steam and condensate.
 - c. Electrical busduct.
 - d. Sheet metal.
 - e. Electrical cable trays, including access space.
 - f. Sprinkler piping and other piping.
 - g. Electrical conduits and wireway.

C. Mechanical Contractor's Responsibility:

1. Assumes responsibility for internal wiring of all equipment provided by the Mechanical Contractor, for example:
 - a. Boiler Feed Pumps.
 - b. Burners.
 - c. Chillers.
 - d. Computer Room Air Conditioning Units.
 - e. Condensate Return Stations.
 - f. Condensing Units.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

- g. Makeup Air Units.
 - h. Electric Humidifiers.
 - i. Gas Trains.
 - j. Package Air Handling Units.
 - k. Packaged Rooftop Units.
- 2. Assumes all responsibility for the Temperature Control wiring, when the Temperature Control Contractor is a Subcontractor to the Mechanical Contractor.
 - 3. Shall verify all existing equipment sizes and capacities where units are to be modified, moved or replaced. Contractor shall notify Architect/Engineer of any discrepancies prior to ordering new units or replacement parts, including replacements of equipment motors.
 - 4. Temperature Control Subcontractor's Responsibility:
 - a. Wiring of all devices needed to make the Temperature Control System functional.
 - b. Verifying any control wiring on the electrical drawings as being by the Electrical Contractor. All wiring required for the Control System, but not shown on the electrical drawings, is the responsibility of the Temperature Control Subcontractor.
 - c. Coordinating equipment locations (such as relays, transformers, etc.) with the Electrical Contractor, where wiring of the equipment is by the Electrical Contractor.
 - 5. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

D. Electrical Contractor's Responsibility:

- 1. Provides all combination starters, manual starters and disconnect devices shown on the Electrical Drawings or indicated to be by the Electrical Contractor on the Mechanical Drawings or Specifications.
- 2. Installs and wires all remote control devices furnished by the Mechanical Contractor or Temperature Control Subcontractor when so noted on the Electrical Drawings.
- 3. Provides motor control and temperature control wiring, where so noted on the drawings.
- 4. Coordinate with the Mechanical Contractor for size of motors and/or other electrical devices involved with repair or replacement of existing equipment.
- 5. Furnishes, installs and connects all relays, etc., for automatic shutdown of certain fans upon actuation of the Fire Alarm System as indicated and specified in Division 28.
- 6. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

1.6 COORDINATION DRAWINGS

A. Definitions:

- 1. Coordination Drawings: A compilation of the pertinent layout and system drawings that show the sizes and locations, including elevations, of system components and required access areas to ensure that no two objects will occupy the same space.
 - a. Mechanical trades shall include, but are not limited to, mechanical equipment, ductwork, fire protection systems, plumbing piping, medical gas systems, hydronic piping, steam and steam condensate piping, and any item that may impact coordination with other disciplines.
 - b. Electrical trades shall include, but are not limited to, electrical equipment, conduit 1.5" and larger, conduit racks, cable trays, pull boxes, transformers, raceway, busway, lighting, ceiling-mounted devices, and any item that may impact coordination with other disciplines.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

- c. Technology trades shall include, but are not limited to, technology equipment, racks, conduit 1.5" and larger, conduit racks, cable trays, ladder rack, pull boxes, raceway, ceiling-mounted devices, and any item that may impact coordination with other disciplines.
 - d. Maintenance clearances and code-required dedicated space shall be included.
 - e. The coordination drawings shall include all underground, underfloor, in-floor, in chase, and vertical trade items.
 - 2. Spaces with open/cloud ceiling architecture shall indicate the overhead utilities and locate equipment as required to maintain clearance above lights. The intent for the installation is to maintain a maximum allowable vertical clearance and an organized/clean manner in the horizontal. Notify Architect/Engineer of the maximum clearance which can be maintained. Failure to comply will result in modifications with no cost to Owner.
 - a. In cloud ceiling architecture, when open cabling/wire and/or cable tray crosses gaps between ceiling clouds and/or walls, cabling is to transition to conduits to span the gaps in order to conceal cabling from below.
 - 3. The contractors shall use the coordination process to identify the proper sequence of installation of all utilities above ceilings and in other congested areas, to ensure an orderly and coordinated end result, and to provide adequate access for service and maintenance.
- B. Participation:
- 1. The contractors and subcontractors responsible for work defined above shall participate in the coordination drawing process.
 - 2. One contractor shall be designated as the Coordinating Contractor for purposes of preparing a complete set of composite electronic CAD coordination drawings that include all applicable trades, and for coordinating the activities related to this process. The Coordinating Contractor for this project shall be the Mechanical Contractor.
 - a. The Coordinating Contractor shall utilize personnel familiar with requirements of this project and skilled as draftspersons/CAD operators, competent to prepare the required coordination drawings.
 - 3. Electronic CAD drawings shall be submitted to the Coordinating Contractor for addition of work by other trades. IMEG will provide electronic file copies of applicable drawings for contractor's use if the contractor signs and returns an "Electronic File Transfer" waiver provided by IMEG. IMEG will not consider blatant reproductions of original file copies an acceptable alternative for coordination drawings.
- C. Drawing Requirements:
- 1. The file format and file naming convention shall be coordinated with and agreed to by all contractors participating in the coordination process and the Owner.
 - a. Scale of drawings:
 - 1) General plans: 1/4 Inch = 1'-0" (minimum).
 - 2) Mechanical, electrical, communication rooms, and including the surrounding areas within 10 feet: 1/2 Inch = 1'-0" (minimum).
 - 3) Shafts and risers: 1/2 Inch = 1'-0" (minimum).
 - 4) Sections of shafts and mechanical and electrical equipment rooms: 1/4 Inch = 1'-0" (minimum).
 - 5) Sections of congested areas: 1/2 Inch = 1'-0" (minimum).

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

2. Ductwork layout drawings shall be the baseline system for other components. Ductwork layout drawings shall be modified to accommodate other components as the coordination process progresses.
3. There may be more drawings required for risers, top and bottom levels of mechanical rooms, and shafts.
4. The minimum quantity of drawings will be established at the first coordination meeting and sent to the Architect/Engineer for review. Additional drawings may be required if other areas of congestion are discovered during the coordination process.

D. General:

1. Coordination drawing files shall be made available to the Architect/Engineer and Owner's Representative. The Architect/Engineer will only review identified conflicts and give an opinion, but will not perform as a coordinator.
2. A plotted set of coordination drawings shall be available at the project site.
3. Coordination drawings are not shop drawings and shall not be submitted as such.
4. The contract drawings are schematic in nature and do not show every fitting and appurtenance for each utility. Each contractor is expected to have included in the bid sufficient fittings, material, and labor to allow for adjustments in routing of utilities made necessary by the coordination process and to provide a complete and functional system.
5. The contractors will not be allowed additional costs or time extensions due to participation in the coordination process.
6. The contractors will not be allowed additional costs or time extensions for additional fittings, reroutings or changes of duct size, that are essentially equivalent sizes to those shown on the drawings and determined necessary through the coordination process.
7. The Architect/Engineer reserves the right to determine space priority of equipment in the event of spatial conflicts or interference between equipment, piping, conduit, ducts, and equipment provided by the trades.
8. Changes to the contract documents that are necessary for systems installation and coordination shall be brought to the attention of the Architect/Engineer.
9. Access panels shall preferably occur only in gypsum board walls or plaster ceilings where indicated on the drawings.
 - a. Access to mechanical, electrical, technology, and other items located above the ceiling shall be through accessible lay-in ceiling tile areas.
 - b. Potential layout changes shall be made to avoid additional access panels.
 - c. Additional access panels shall not be allowed without written approval from the Architect/Engineer at the coordination drawing stage.
 - d. Providing additional access panels shall be considered after other alternatives are reviewed and discarded by the Architect/Engineer and the Owner's Representative.
 - e. When additional access panels are required, they shall be provided without additional cost to the Owner.
10. Complete the coordination drawing process and obtain sign off of the drawings by all contractors prior to installing any of the components.
11. Conflicts that result after the coordination drawings are signed off shall be the responsibility of the contractor or subcontractor who did not properly identify their work requirements, or installed their work without proper coordination.
12. Updated coordination drawings that reflect as-built conditions may be used as record documents.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

1.7 QUALITY ASSURANCE

A. Contractor's Responsibility Prior to Submitting Pricing Data:

1. The Contractor is responsible for constructing complete and operating systems. The Contractor acknowledges and understands that the Contract Documents are a two-dimensional representation of a three-dimensional object, subject to human interpretation. This representation may include imperfect data, interpreted codes, utility guidelines, three-dimensional conflicts, and required field coordination items. Such deficiencies can be corrected when identified prior to ordering material and starting installation. The Contractor agrees to carefully study and compare the individual Contract Documents and report at once in writing to the Design Team any deficiencies the Contractor may discover. The Contractor further agrees to require each subcontractor to likewise study the documents and report at once any deficiencies discovered.
2. The Contractor shall resolve all reported deficiencies with the Architect/Engineer prior to awarding any subcontracts, ordering material, or starting any work with the Contractor's own employees. Any work performed prior to receipt of instructions from the Design Team will be done at the Contractor's risk.

B. Qualifications:

1. Only products of reputable manufacturers are acceptable.
2. All Contractors and subcontractors shall employ only workers skilled in their trades.

C. Compliance with Codes, Laws, Ordinances:

1. Conform to all requirements of the City of Milan, IL Codes, Laws, Ordinances and other regulations having jurisdiction.
2. Conform to all State Codes.
3. Conform to Federal Act S.3874 requiring the reduction of lead in drinking water.
4. If there is a discrepancy between the codes and regulations and these specifications, the Architect/Engineer shall determine the method or equipment used.
5. If the Contractor notes, at the time of bidding, that any parts of the drawings or specifications do not comply with the codes or regulations, Contractor shall inform the Architect/Engineer in writing, requesting a clarification. If there is insufficient time for this procedure, Contractor shall submit with the proposal a separate price to make the system comply with the codes and regulations.
6. All changes to the system made after letting of the contract, to comply with codes or requirements of Inspectors, shall be made by the Contractor without cost to the Owner.
7. If there is a discrepancy between manufacturer's recommendations and these specifications, the manufacturer's recommendations shall govern.
8. All rotating shafts and/or equipment shall be completely guarded from all contact. Partial guards and/or guards that do not meet all applicable OSHA standards are not acceptable. Contractor is responsible for providing this guarding if it is not provided with the equipment supplied.

D. Permits, Fees, Taxes, Inspections:

1. Procure all applicable permits and licenses.
2. Abide by all laws, regulations, ordinances, and other rules of the State or Political Subdivision where the work is done, or as required by any duly constituted public authority.
3. Pay all charges for permits or licenses.
4. Pay all fees and taxes imposed by the State, Municipal and/or other regulatory bodies.
5. Pay all charges arising out of required inspections by an authorized body.
6. Pay all charges arising out of required contract document reviews associated with the project and as initiated by the Owner or authorized agency/consultant.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

7. Where applicable, all fixtures, equipment and materials shall be approved or listed by Underwriter's Laboratories, Inc.
- E. Utility Company Requirements:
1. Secure from the appropriate private or public utility company all applicable requirements.
 2. Comply with all utility company requirements.
- F. Examination of Drawings:
1. The drawings for the plumbing work are completely diagrammatic, intended to convey the scope of the work and to indicate the general arrangements and locations of equipment, outlets, etc., and the approximate sizes of equipment.
 2. Contractor shall determine the exact locations of equipment and rough-ins, and the exact routing of pipes and ducts to best fit the layout of the job.
 3. Scaling of the drawings is not sufficient or accurate for determining these locations.
 4. Where job conditions require reasonable changes in indicated arrangements and locations, such changes shall be made by the Contractor at no additional cost to the Owner.
 5. Because of the scale of the drawings, certain basic items, such as fittings, boxes, valves, unions, etc., may not be shown, but where required by other sections of the specifications or required for proper installation of the work, such items shall be furnished and installed.
 6. If an item is either on the drawings or in the specifications, it shall be included in this contract.
 7. Determination of quantities of material and equipment required shall be made by the Contractor from the documents. Where discrepancies arise between drawings, schedules and/or specifications, the greater number shall govern.
 8. Where used in mechanical documents, the word "furnish" shall mean supply for use, the word "install" shall mean connect complete and ready for operation, and the word "provide" shall mean to supply for use and connect complete and ready for operation.
 - a. Any item listed as furnished shall also be installed, unless otherwise noted.
 - b. Any item listed as installed shall also be furnished, unless otherwise noted.
- G. Field Measurements:
1. Verify all pertinent dimensions at the job site before ordering any materials or fabricating any supports, pipes or ducts.
- H. Electronic Media/Files:
1. Construction drawings for this project have been prepared utilizing Revit.
 2. Contractors and Subcontractors may request electronic media files of the contract drawings and/or copies of the specifications. Specifications will be provided in PDF format.
 3. Upon request for electronic media, the Contractor shall complete and return a signed "Electronic File Transmittal" form provided by IMEG.
 4. If the information requested includes floor plans prepared by others, the Contractor will be responsible for obtaining approval from the appropriate Design Professional for use of that part of the document.
 5. The electronic contract documents can be used for preparation of shop drawings and as-built drawings only. The information may not be used in whole or in part for any other project.
 6. The drawings prepared by IMEG for bidding purposes may not be used directly for ductwork layout drawings or coordination drawings.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

7. The use of these CAD documents by the Contractor does not relieve them from their responsibility for coordination of work with other trades and verification of space available for the installation.
8. The information is provided to expedite the project and assist the Contractor with no guarantee by IMEG as to the accuracy or correctness of the information provided. IMEG accepts no responsibility or liability for the Contractor's use of these documents.

1.8 WEB-BASED PROJECT SOFTWARE

- A. The General Contractor shall provide a web-based project software site for the purpose of hosting and managing project communication and documentation until completion of the warranty phase.
- B. The web-based project software shall include, at a minimum, the following features: construction schedule, submittals, RFIs, ASIs, construction change directives, change orders, drawing management, specification management, payment applications, contract modifications, meeting minutes, construction progress photos.
- C. Provide web-based project software user licenses for use by the Architect/Engineer. Access will be provided from the start of the project through the completion of the warranty phase.
- D. At project completion, provide digital archive of entire project in format that is readable by common desktop software applications in format acceptable to Architect/Engineer. Provide data in locked format to prevent further changes.

1.9 SUBMITTALS

- A. Submittals shall be required for the following items, and for additional items where required elsewhere in the specifications or on the drawings.

1. Submittals List:

Referenced Specification	Submittal Item
Section	
22 05 29	Hangers and Supports
22 05 53	Plumbing Identification
22 07 19	Plumbing Pipe Insulation
22 10 00	Plumbing Piping Systems and Valves
22 10 30	Plumbing Specialties
22 40 00	Plumbing Fixtures

- B. General Submittal Procedures: In addition to the provisions of Division 1, the following are required:

1. Transmittal: Each transmittal shall include the following:

- a. Date
- b. Project title and number
- c. Contractor's name and address
- d. Division of work (e.g., plumbing, heating, ventilating, etc.)
- e. Description of items submitted and relevant specification number
- f. Notations of deviations from the contract documents
- g. Other pertinent data

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

2. Submittal Cover Sheet: Each submittal shall include a cover sheet containing:
 - a. Date
 - b. Project title and number
 - c. Architect/Engineer
 - d. Contractor and subcontractors' names and addresses
 - e. Supplier and manufacturer's names and addresses
 - f. Division of work (e.g., plumbing, heating, ventilating, etc.)
 - g. Description of item submitted (using project nomenclature) and relevant specification number
 - h. Notations of deviations from the contract documents
 - i. Other pertinent data
 - j. Provide space for Contractor's review stamps
3. Composition:
 - a. Submittals shall be submitted using specification sections and the project nomenclature for each item.
 - b. Individual submittal packages shall be prepared for items in each specification section. All items within a single specification section shall be packaged together where possible. An individual submittal may contain items from multiple specifications sections if the items are intimately linked (e.g., pumps and motors).
 - c. All sets shall contain an index of the items enclosed with a general topic description on the cover.
4. Content: Submittals shall include all fabrication, erection, layout, and setting drawings; manufacturers' standard drawings; schedules; descriptive literature, catalogs and brochures; performance and test data; electrical power criteria (e.g., voltage, phase, amps, horsepower, kW, etc.) wiring and control diagrams; Short Circuit Current Rating (SCCR); dimensions; shipping and operating weights; shipping splits; service clearances; and all other drawings and descriptive data of materials of construction as may be required to show that the materials, equipment or systems and the location thereof conform to the requirements of the contract documents.
5. Contractor's Approval Stamp:
 - a. The Contractor shall thoroughly review and approve all shop drawings before submitting them to the Architect/Engineer. The Contractor shall stamp, date and sign each submittal certifying it has been reviewed.
 - b. Unstamped submittals will be rejected.
 - c. The Contractor's review shall include, but not be limited to, verification of the following:
 - 1) Only approved manufacturers are used.
 - 2) Addenda items have been incorporated.
 - 3) Catalog numbers and options match those specified.
 - 4) Performance data matches that specified.
 - 5) Electrical characteristics and loads match those specified.
 - 6) Equipment connection locations, sizes, capacities, etc. have been coordinated with other affected trades.
 - 7) Dimensions and service clearances are suitable for the intended location.
 - 8) Equipment dimensions are coordinated with support steel, housekeeping pads, openings, etc.
 - 9) Constructability issues are resolved (e.g., weights and dimensions are suitable for getting the item into the building and into place, sinks fit into countertops, etc.).

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

- d. The Contractor shall review, stamp and approve all subcontractors' submittals as described above.
 - e. The Contractor's approval stamp is required on all submittals. Approval will indicate the Contractor's review of all material and a complete understanding of exactly what is to be furnished. Contractor shall clearly mark all deviations from the contract documents on all submittals. If deviations are not marked by the Contractor, then the item shall be required to meet all drawing and specification requirements.
6. Submittal Identification and Markings:
- a. The Contractor shall clearly mark each item with the same nomenclature applied on the drawings or in the specifications.
 - b. The Contractor shall clearly indicate the size, finish, material, etc.
 - c. Where more than one model is shown on a manufacturer's sheet, the Contractor shall clearly indicate exactly which item and which data is intended.
 - d. All marks and identifications on the submittals shall be unambiguous.
7. Schedule submittals to expedite the project. Coordinate submission of related items.
8. Identify variations from the contract documents and product or system limitations that may be detrimental to the successful performance of the completed work.
9. Reproduction of contract documents alone is not acceptable for submittals.
10. Incomplete submittals will be rejected without review. Partial submittals will only be reviewed with prior approval from the Architect/Engineer.
11. Submittals not required by the contract documents may be returned without review.
12. The Architect/Engineer's responsibility shall be to review one set of shop drawing submittals for each product. If the first submittal is incomplete or does not comply with the drawings and/or specifications, the Contractor shall be responsible to bear the cost for the Architect/Engineer to recheck and handle the additional shop drawing submittals.
13. Submittals shall be reviewed and approved by the Architect/Engineer **before** releasing any equipment for manufacture or shipment.
14. Contractor's responsibility for errors, omissions or deviation from the contract documents in submittals is not relieved by the Architect/Engineer's approval.
15. Schedule shall allow for adequate time to perform orderly and proper review of submittals, including time for consultants and Owner if required, and resubmittals by Contractor if necessary, and to cause no delay in Work or in activities of Owner or other contractors.
- a. Allow at least two weeks for Architect's/Engineer's review and processing of each submittal.
16. Architect/Engineer reserves the right to withhold action on a submittal which, in the Architect/Engineer's opinion, requires coordination with other submittals until related submittals are received. The Architect/Engineer will notify the Contractor, in writing, when they exercise this right.
- C. Electronic Submittal Procedures:
- 1. Distribution: Email submittals as attachments to all parties designated by the Architect/Engineer, unless a web-based submittal program is used.
 - 2. Transmittals: Each submittal shall include an individual electronic letter of transmittal.
 - 3. Format: Electronic submittals shall be in PDF format only. Scanned copies, in PDF format, of paper originals are acceptable. Submittals that are not legible will be rejected. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

4. File Names: Electronic submittal file names shall include the relevant specification section number followed by a description of the item submitted, as follows. Where possible, include the transmittal as the first page of the PDF instead of using multiple electronic files.
 - a. Submittal file name: 22 XX XX.description.YYYYMMDD
 - b. Transmittal file name: 22 XX XX.description.YYYYMMDD
5. File Size: Files shall be transmitted via a pre-approved method. Larger files may require an alternative transfer method, which shall also be pre-approved.

1.10 SCHEDULE OF VALUES

- A. The requirements herein are in addition to the provisions of Division 1.
- B. Format:
 1. Use AIA Document Continuation Sheets G703 or another similar form approved by the Owner and Architect/Engineer.
 2. Submit in Excel format.
 3. Support values given with substantiating data.
- C. Preparation:
 1. Itemize work required by each specification section and list all providers. All work provided by subcontractors and major suppliers shall be listed on the Schedule of Values. List each subcontractor and supplier by company name.
 2. Break down all costs into:
 - a. Material: Delivered cost of product with taxes paid.
 - b. Labor: Labor cost, excluding overhead and profit.
 3. Itemize the cost for each of the following:
 - a. Overhead and profit.
 - b. Bonds.
 - c. Insurance.
 - d. General Requirements: Itemize all requirements.
 4. For each line item having an installed cost of more than \$5,000, break down costs to list major products or operations under each item. At a minimum, provide material and labor cost line items for the following:
 - a. Excavation and backfill for underground piping systems inside the building.
 - b. Underground piping systems inside the building (sanitary, storm, etc.) listed separately. Break down the material and labor for each piping system based on geography (building, floor, wing and/or phase).
 - c. Each aboveground piping system (sanitary, storm, domestic water, etc.). Break down the material and labor for each piping system based on geography (building, floor, wing and/or phase).
 - d. Pipe insulation with separate material and labor line items for each piping system listed above.
 - e. Each piece of equipment requiring shop drawings (e.g., backflow preventer, water heater, water softener, etc.) using the project nomenclature (BFP-1, WH-1, WS-1, etc.).

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

- f. Each plumbing fixture (e.g., WC, lavatory, sink, etc.). Multiple units of the same type can be listed together, provided quantities are also listed so unit costs can be determined.
- g. Site utilities (5' beyond building)
- h. Seismic design
- i. Water balancing
- j. Commissioning
- k. Record drawings
- l. Punchlist and closeout

D. Update Schedule of Values when:

- 1. Indicated by Architect/Engineer.
- 2. Change of subcontractor or supplier occurs.
- 3. Change of product or equipment occurs.

1.11 CHANGE ORDERS

- A. A detailed material and labor takeoff shall be prepared for each change order, along with labor rates and markup percentages. Change orders shall be broken down by sheet or associated individual line item indicated in the change associated narrative, whichever provides the most detailed breakdown. Change orders with inadequate breakdown will be rejected.
- B. Itemized pricing with unit cost shall be provided from all distributors and associated subcontractors.
- C. Change order work shall not proceed until authorized.

1.12 EQUIPMENT SUPPLIERS' INSPECTION

- A. The following equipment shall not be placed in operation until a competent installation and service representative of the manufacturer has inspected the installation and certified that the equipment is properly installed, adjusted and lubricated; that preliminary operating instructions have been given; and that the equipment is ready for operation:
 - 1. Fire Seal Systems
 - 2. Seismic Restraints and Equipment Bracing
- B. Contractor shall arrange for and obtain supplier's on-site inspection(s) at proper time(s) to assure each phase of equipment installation and/or connection is in accordance with the manufacturer's instructions.
- C. Submit copies of start-up reports to the Architect/Engineer and include copies of Owner's Operation and Maintenance Manuals.

1.13 PRODUCT DELIVERY, STORAGE, HANDLING & MAINTENANCE

- A. Exercise care in transporting and handling to avoid damage to materials. Store materials on the site to prevent damage. Keep materials clean, dry and free from harmful conditions. Immediately remove any materials that become wet or that are suspected of becoming contaminated with mold or other organisms.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

- B. Protect equipment, components, and openings with airtight covers and exercise care at every stage of storage, handling, and installation of equipment to prevent airborne dust and dirt from entering or fouling equipment to include, but not limited to:
 - 1. Motor windings and ventilation openings.
 - 2. Bearings.
 - 3. Equipment Pipe and Accessories connection openings. (e.g. boiler connections, coil connections, etc.)
 - 4. Starter and control cabinets.
 - 5. Heat transfer coils.
 - 6. Pump Seals.
 - 7. Combustion burner and blower equipment (e.g. combustion air intake, combustion vent/flue, etc.)
- C. Equipment and components that are visibly damaged or have been subject to environmental conditions prior to building turnover to Owner that could shorten the life of the component (for example, water damage, humidity, dust and debris, excessive hot or cold storage location, etc.) shall be repaired or replaced with new equipment or components without additional cost to the building owner.
- D. Keep all bearings properly lubricated and all belts properly tensioned and aligned.
- E. Coordinate the installation of heavy and large equipment with the General Contractor and/or Owner. If the Mechanical Contractor does not have prior documented experience in rigging and lifting similar equipment, he/she shall contract with a qualified lifting and rigging service that has similar documented experience. Follow all equipment lifting and support guidelines for handling and moving.
- F. Contractor is responsible for moving equipment into the building and/or site. Contractor shall review site prior to bid for path locations and any required building modifications to allow movement of equipment. Contractor shall coordinate the work with other trades.

1.14 NETWORK / INTERNET CONNECTED EQUIPMENT

- A. These specifications may require certain equipment or systems to have network, Internet and/or remote access capability ("Network Capability"). Any requirement for Network Capability shall be interpreted only as a functional capability and is not to be construed as authority to connect or enable any Network Capability. Network Capability may only be connected or enabled with the express written consent of the Owner.

1.15 WARRANTY

- A. Provide one-year warranty, unless otherwise noted, to the Owner for all fixtures, equipment, materials, and workmanship.
- B. The warranty period for all work in this Division of the specifications shall commence on the date of final acceptance, unless a whole or partial system or any separate piece of equipment or component is put into use for the benefit of any party other than the installing contractor with prior written authorization. In this instance, the warranty period shall commence on the date when such whole system, partial system or separate piece of equipment or component is placed in operation and accepted in writing by the Owner.
- C. Warranty requirements shall extend to correction, without cost to the Owner, of all Work found to be defective or nonconforming to the contract documents. The Contractor shall bear the cost of correcting all damage resulting from defects or nonconformance with contract documents.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

1.16 INSURANCE

- A. Contractor shall maintain insurance coverage as set forth in Division 0 of these specifications.

1.17 MATERIAL SUBSTITUTION

- A. Where several manufacturers' names are given, the first manufacturer is the basis for job design and establishes the quality.
- B. Equivalent equipment manufactured by the other listed manufacturers may be used. Contractor shall ensure that all items submitted by these other manufacturers meet all requirements of the drawings and specifications and fits in the allocated space. When using other listed manufacturers, the Contractor shall assume responsibility for any and all modifications necessary (including, but not limited to structural supports, electrical connections, piping and ductwork connections and arrangement, plumbing connections and rough-in, and regulatory agency approval, etc.) and coordinate such with other contractors.
- C. Any material, article or equipment of other unnamed manufacturers which will adequately perform the services and duties imposed by the design and is of a quality equal to or better than the material, article or equipment identified by the drawings and specifications may be used if approval is secured in writing from the Architect/Engineer not later than ten days prior to the bid opening.
- D. This Contractor assumes all costs incurred as a result of using the offered material, article or equipment, on the Contractor's part or on the part of other Contractors whose work is affected.
- E. This Contractor may list voluntary add or deduct prices for alternate materials on the bid form. These items will not be used in determining the low bidder.
- F. All material substitutions requested later than ten (10) days prior to bid opening must be listed as voluntary changes on the bid form.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 JOBSITE SAFETY

- A. Neither the professional activities of the Architect/Engineer, nor the presence of the Architect/Engineer or the employees and subconsultants at a construction site, shall relieve the Contractor and other entity of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending or coordinating all portions of the work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The Architect/Engineer and personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Contractor is solely responsible for jobsite safety. The Architect/Engineer and the Architect/Engineer's consultants shall be indemnified and shall be made additional insureds under the Contractor's general liability insurance policy.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

3.2 EXCAVATION, FILL, BACKFILL, COMPACTION

A. General:

1. Prior to the commencement of any excavation or digging, the Contractor shall verify all underground utilities with the regional utility locator. Provide prior notice to the locator before excavations. Contact information for most regional utility locators can be found at the following website (<https://call811.com/>) or by calling 811.
2. The Contractor shall do all excavating, filling, backfilling and compacting associated with the work.

B. Excavation:

1. Make all excavations to accurate, solid, undisturbed earth, and to proper dimensions.
2. Where excavations are made in error below foundations, concrete of same strength as specified for the foundations or thoroughly compacted sand-gravel fill, as determined by the Architect/Engineer, shall be placed in such excess excavations. Place thoroughly compacted, clean, stable fill in excess excavations under slabs on grade, at the Contractor's expense.
3. Trim bottom and sides of excavations to grades required for foundations.
4. Protect excavations against frost and freezing.
5. Take care in excavating not to damage surrounding structures, equipment, or buried pipe. Do not undermine footing or foundation.
6. Perform all trenching in a manner to prevent cave-ins and risk to workers.
7. Where original surface is pavement or concrete, the surface shall be saw cut to provide clean edges and assist in the surface restoration.
8. Where satisfactory bearing soil for foundations is not found at the indicated levels, the Architect/Engineer or their representative shall be notified immediately, and no further work shall be done until further instructions are given by the Architect/Engineer or their representative.

C. Dewatering:

1. Contractor shall furnish, install, operate, and remove all dewatering pumps and pipes needed to keep trenches and pits free of water.

D. Underground Obstructions:

1. Known underground piping, foundations, and other obstructions in the vicinity of construction are shown on the drawings. Use great care in making installations near underground obstruction.
2. If objects not shown on the drawings are encountered, remove, relocate, or perform extra work as directed by the Architect/Engineer.

E. Fill and Backfilling:

1. Utilities Bedding: Lay underground utilities on minimum of 6" sand bedding. Compact bedding under utilities smooth, with no sharp edges protruding, to protect the utilities from puncture. Shape bedding to provide continuous support for bells, joints, and barrels of utilities and for joints and fittings.
2. Envelope Around Utilities to 6" Above Utilities: Place sand to a height of 6" over utilities in 6" layers. After connection joints are made, any misalignment can be corrected by tamping backfill around the utilities.
3. Backfill From 6" Above Utilities to Earthen Grade: Place all backfill materials above the utilities in uniform layers not exceeding 6" deep.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

4. Backfill From 6" Above Utilities to Below Slabs or Paved Area: Where the sand fill and backfill will ultimately be under a building, floor or paving, each layer of backfill materials shall be compacted to 95% of the maximum density determined by AASHTO Designation T 99 or ASTM Designation D 698. Moisture content of soil at time of compaction shall not exceed plus or minus 2% of optimum moisture content determined by AASHTO T 99 or ASTM D 698 test.
5. Backfill Materials:
 - a. Sand, CA6: Each layer shall be placed, then carefully and uniformly tamped, to eliminate lateral or vertical displacement.
 - b. Native Soil: Native soil materials may be used as backfill if approved by the Geotechnical Engineer. Native soils shall be free of rock or gravel larger than 3" in any dimension and shall be free of debris, waste, frozen materials, vegetation, high void content, and other deleterious materials. Each layer shall be placed, then carefully and uniformly tamped, to eliminate lateral or vertical displacement.
 - c. Flowable Fill: Cementitious, self-leveling, self-compacting slurry as defined by the ACI with compressive strength of 50-100psi at 28 days; consisting of a mixture of fine aggregate or filler, water and cementitious materials. Filler material consist of sand, fly ash, spent foundry sand, quarry fines, baghouse dust. Cementitious materials consist of Portland cement, pozzolanic materials, and self-cementing materials. Flowable fill may be placed in a pour instead of 6" layers noted above.
6. Water shall not be permitted to rise in unbackfilled trenches.
7. Dispose of excess excavated earth as directed.
8. Backfill all trenches and excavations immediately after installing utilities or removal of forms, unless other protection is provided.
9. Around piers and isolated foundations and structures, backfill and fill shall be placed and consolidated simultaneously on all sides to prevent wedge action and displacement. Fill and backfill materials shall be spread in 6 inch uniform horizontal layers with each layer compacted separately to required density.

F. Surface Restoration:

1. Where trenches are cut through existing graded, planted, or landscaped areas, the areas shall be restored to the original condition. Replace all planting removed or damaged to its original condition. A minimum of 6 inches of topsoil shall be applied where disturbed areas are to be seeded or sodded.
2. Concrete or asphalt type pavement, seal coat, rock, gravel or earth surfaces removed or damaged shall be replaced with comparable materials and restored to original condition.

3.3 ARCHITECT/ENGINEER OBSERVATION OF WORK

A. The Contractor shall provide seven (7) calendar days' notice to the Architect/Engineer prior to:

1. Placing fill over underground and underslab utilities.
2. Covering exterior walls, interior partitions and chases.
3. Installing hard or suspended ceilings and soffits.

B. The Architect/Engineer will have the opportunity to review the installation and provide a written report noting deficiencies requiring correction. The Contractor's schedule shall account for these reviews and show them as line items in the approved schedule.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

C. Above-Ceiling Final Observation

1. All work above the ceilings must be complete prior to the Architect/Engineer's review. This includes, but is not limited to:
 - a. Pipe insulation is installed and fully sealed.
 - b. Pipe wall penetrations are sealed.
 - c. Pipe identification and valve tags are installed.
2. In order to prevent the Above-Ceiling Final Observation from occurring too early, the Contractor shall review the status of the work and certify, in writing, that the work is ready for the Above-Ceiling Final Observation.
3. It is understood that if the Architect/Engineer finds the ceilings have been installed prior to this review and prior to 7 days elapsing, the Architect/Engineer may not recommend further payments to the contractor until such time as full access has been provided.

3.4 PROJECT CLOSEOUT

A. The following paragraphs supplement the requirements of Division 1.

B. IDPH Final Occupancy Checklist for Request of Inspection:

1. Each Contractor must submit all forms and certifications required by IDPH relating to their work at 85% completion of the project or when directed by the Owner/Architect/Engineer.

C. Final Jobsite Observation:

1. In order to prevent the Final Jobsite Observation from occurring too early, the Contractor is required to review the completion status of the project and certify that the job is ready for the final jobsite observation.
2. Attached to the end of this section is a typical list of items that represent the degree of job completeness expected prior to requesting a review.
3. Upon Contractor certification that the project is complete and ready for a final observation, the Contractor shall sign the attached certification and return it to the Architect/Engineer so that the final observation can be scheduled.
4. It is understood that if the Architect/Engineer finds the job not ready for the final observation and that additional trips and observations are required to bring the project to completion, the costs incurred by the Architect/Engineer's additional time and expenses will be deducted from the Contractor's contract retainage prior to final payment at the completion of the job.

D. Before final payment is authorized, this Contractor must submit the following:

1. Operation and maintenance manuals with copies of approved shop drawings.
2. Record documents including marked-up or reproducible drawings and specifications.
3. A report documenting the instructions given to the Owner's representatives complete with the number of hours spent in the instruction. The report shall bear the signature of an authorized agent of This Contractor and shall be signed by the Owner's representatives.
4. Start-up reports on all equipment requiring a factory installation inspection or start-up.
5. Provide spare parts, maintenance, and extra materials in quantities specified in individual specification sections. Deliver to project site and place in location as directed; receipt by Architect/Engineer required prior to final payment approval.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

3.5 OPERATION AND MAINTENANCE MANUALS

A. General:

1. Provide an electronic copy of the O&M manuals as described below for Architect/Engineer's review and approval. The electronic copy shall be corrected as required to address the Architect/Engineer's comments. Once corrected, electronic copies and paper copies shall be distributed as directed by the Architect/Engineer.
2. Approved O&M manuals shall be completed and in the Owner's possession prior to Owner's acceptance and at least 10 days prior to instruction of operating personnel.

B. Electronic Submittal Procedures:

1. Distribution: Email the O&M manual as attachments to all parties designated by the Architect/Engineer.
2. Transmittals: Each submittal shall include an individual electronic letter of transmittal.
3. Format: Electronic submittals shall be in PDF format only. Scanned copies, in PDF format, of paper originals are acceptable. Submittals that are not legible will be rejected. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.
4. File Names: Electronic submittal file names shall include the relevant specification section number followed by a description of the item submitted, as follows. Where possible, include the transmittal as the first page of the PDF instead of using multiple electronic files.
 - a. O&M file name: O&M.div22.contractor.YYYYMMDD
 - b. Transmittal file name: O&Mtransmittal.div22.contractor.YYYYMMDD
5. File Size: Files shall be transmitted via a pre-approved method. Larger files may require an alternative transfer method, which shall also be pre-approved.
6. Provide the Owner with an approved copy of the O&M manual on compact discs (CD), digital video discs (DVD), or flash drives with a permanently affixed label, printed with the title "Operation and Maintenance Instructions", title of the project and subject matter of disc/flash drive when multiple disc/flash drives are required.
7. All text shall be searchable.
8. Bookmarks shall be used, dividing information first by specification section, then systems, major equipment and finally individual items. All bookmark titles shall include the nomenclature used in the construction documents and shall be an active link to the first page of the section being referenced.

C. Operation and Maintenance Instructions shall include:

1. Title Page: Include title page with project title, Architect, Engineer, Contractor, all subcontractors, and major equipment suppliers, with addresses, telephone numbers, website addresses, email addresses and point of contacts. Website URLs and email addresses shall be active links in the electronic submittal.
2. Table of Contents: Include a table of contents describing specification section, systems, major equipment, and individual items.
3. Copies of all final approved shop drawings and submittals. Include Architect's/Engineer's shop drawing review comments. Insert the individual shop drawing directly after the Operation and Maintenance information for the item(s) in the review form.
4. Copy of final approved test and balance reports.
5. Copies of all factory inspections and/or equipment startup reports.
6. Copies of warranties.
7. Schematic electrical power/controls wiring diagrams of the equipment that have been updated for field conditions. Field wiring shall have label numbers to match drawings.
8. Dimensional drawings of equipment.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

9. Capacities and utility consumption of equipment.
10. Detailed parts lists with lists of suppliers.
11. Operating procedures for each system.
12. Maintenance schedule and procedures. Include a chart listing maintenance requirements and frequency.
13. Repair procedures for major components.
14. List of lubricants in all equipment and recommended frequency of lubrication.
15. Instruction books, cards, and manuals furnished with the equipment.
16. Owner and Contractor attendance list for domestic water systems operation, maintenance, and flushing training.

3.6 INSTRUCTING THE OWNER'S REPRESENTATIVES

- A. Adequately instruct the Owner's designated representatives in the maintenance, care, and operation of all systems installed under this contract.
- B. The Owner has the option to make a video recording of all instructions. Coordinate schedule of instructions to facilitate this recording.
- C. The instructions shall include:
 1. Explanation of all system flow diagrams.
 2. Maintenance of equipment.
 3. Start-up procedures for all major equipment.
 4. Explanation of seasonal system changes.
 5. Explanation of Owner's Responsibilities to operate, maintain, and flush domestic water system (i.e., ASHRAE Standard 188).
- D. Operating Instructions:
 1. Contractor is responsible for all instructions to the Owner's representatives for the mechanical and control systems.
 2. If the Contractor does not have staff that can adequately provide the required instructions the Contractor shall include in the bid an adequate amount to reimburse the Owner for the Architect/Engineer to perform these services.

3.7 SYSTEM STARTING AND ADJUSTING

- A. The plumbing systems shall be complete and operating. System startup, testing, adjusting, and balancing to obtain satisfactory system performance is the responsibility of the Contractor. This includes calibration and adjustments of all controls, noise level adjustments and final adjustments as required.
- B. Complete all manufacturer-recommended startup procedures and checklists to verify proper motor rotation, electrical power voltage is within equipment limitations, equipment controls maintain pressures and temperatures within acceptable ranges, all filters and protective guards are in-place, acceptable access is provided for maintenance and servicing, and equipment operation does not pose a danger to personnel or property.
- C. Contractor shall adjust the plumbing systems and controls at season changes during the one year warranty period, as required, to provide satisfactory operation and to prove performance of all systems in all seasons.
- D. All operating conditions and control sequences shall be tested during the start-up period. Test all interlocks, safety shutdowns, controls, and alarms.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

- E. The Contractor, subcontractors, and equipment suppliers shall have skilled technicians to ensure that all systems perform properly. If the Architect/Engineer is requested to visit the job site for trouble shooting, assisting in start-up, obtaining satisfactory equipment operation, resolving installation and/or workmanship problems, equipment substitution issues or unsatisfactory system performance, including call backs during the warranty period, through no fault of the design; the Contractor shall reimburse the Owner on a time and materials basis for services rendered at the Architect/Engineer's standard hourly rates in effect when the services are requested. The Contractor shall pay the Owner for services required that are product, installation or workmanship related. Payment is due within 30 days after services are rendered.

3.8 RECORD DOCUMENTS

- A. The following paragraphs supplement Division 1 requirements.
- B. Maintain at the job site a separate and complete set of plumbing drawings and specifications with all changes made to the systems clearly and permanently marked in complete detail.
- C. Mark drawings to indicate revisions to piping size and location, both exterior and interior; including locations devices, requiring periodic maintenance or repair; actual equipment locations, dimensioned from column lines; actual inverts and locations of underground piping; concealed equipment, dimensioned from column lines; mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located; Change Orders; concealed control system devices.
- D. Before completion of the project, a set of reproducible plumbing drawings will be given to the Contractor for transfer of all as-built conditions from the paper set maintained at the job site. All marks on reproducibles shall be clear and permanent.
- E. Mark specifications to show approved substitutions; Change Orders, and actual equipment and materials used.
- F. Record changes daily and keep the marked drawings available for the Architect/Engineer's examination at any normal work time.
- G. Upon completing the job, and before final payment is made, give the marked-up drawings to the Architect/Engineer.

3.9 ADJUST AND CLEAN

- A. Thoroughly clean all equipment and systems prior to the Owner's final acceptance of the project. Clean all foreign paint, grease, oil, dirt, labels, stickers, and other foreign material from all equipment.
- B. Clean all areas where moisture is present. Immediately report any mold, biological growth, or water damage.
- C. Remove all rust, scale, dirt, oils, stickers and thoroughly clean exterior of all exposed piping, hangers, and accessories.
- D. Remove all rubbish, debris, etc., accumulated during construction from the premises.

3.10 SPECIAL REQUIREMENTS

- A. Contractor shall coordinate the installation of all equipment, valves, dampers, operators, etc., with other trades to maintain clear access area for servicing.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

- B. All equipment shall be installed in such a way to maximize access to parts needing service or maintenance. Review the final field location, placement, and orientation of equipment with the Owner's designated representative prior to setting equipment.
- C. Installation of equipment or devices without regard to coordination of access requirements and confirmation with the Owner's designated representative will result in removal and reinstallation of the equipment at the Contractor's expense.

3.11 IAQ MAINTENANCE FOR OCCUPIED FACILITIES UNDER CONSTRUCTION

- A. Contractors shall make all reasonable efforts to prevent construction activities from affecting the air quality of the occupied areas of the building or outdoor areas near the building. These measures shall include, but not be limited to:
 - 1. All contractors shall endeavor to minimize the amount of contaminants generated during construction. Methods to be employed shall include, but not be limited to:
 - a. Minimizing the amount of dust generated.
 - b. Reducing solvent fumes and VOC emissions.
 - c. Maintain good housekeeping practices, including sweeping and periodic dust and debris removal. There should be no visible haze in the air.
 - d. Protect stored on-site and installed absorptive materials from moisture damage.
 - 2. Request that the Owner designate an IAQ representative.
 - 3. Review and receive approval from the Owner's IAQ representative for all IAQ-related construction activities and negative pressure containment plans.
 - 4. Inform the IAQ representative of all conditions that could adversely impact IAQ, including operations that will produce higher than normal dust production or odors.
 - 5. Schedule activities that may cause IAQ conditions that are not acceptable to the Owner's IAQ representative during unoccupied periods.
 - 6. Request copies of and follow all of the Owner's IAQ and infection control policies.
 - 7. Unless no other access is possible, the entrance to construction site shall not be through the existing facility.
 - 8. To minimize growth of infectious organisms, do not permit damp areas in or near the construction area to remain for over 24 hours.
 - 9. In addition to the criteria above, provide measures as recommended in the SMACNA "IAQ Guidelines for Occupied Buildings Under Construction".

3.12 UTILITY REBATE

- A. Submit utility rebate forms, where offered at project location, with rebate items completed. Rebate may include lighting, lighting controls, variable speed drives, heat pumps, package terminal A/C, air conditioners, chillers, water heaters, programmable thermostats, and motors.
 - 1. Contractor must submit notification of any value engineering or product substitution that will affect the utility rebate amount prior to approval.

SECTION 22 05 00
BASIC PLUMBING REQUIREMENTS

READINESS CERTIFICATION PRIOR TO FINAL JOBSITE OBSERVATION

To prevent the final job observation from occurring too early, we require that the Contractor review the completion status of the project and, by copy of this document, certify that the job is indeed ready for the final job observation. The following is a typical list of items that represent the degree of job completeness expected prior to your requesting a final job observation.

1. Penetrations fire sealed and labeled in accordance with specifications.
2. All pumps operating and balanced.
3. All plumbing fixtures installed and caulked.
4. Pipe insulation complete, pipes labeled and valves tagged.
5. Owner and Contractor attendance list for domestic water systems operation, maintenance, and flushing training.

Accepted by:

Prime Contractor _____

By _____ Date _____

Upon Contractor certification that the project is complete and ready for a final job observation, we require the Contractor to sign this agreement and return it to the Architect/Engineer so that the final observation can be scheduled.

It is understood that if the Architect/Engineer finds the job not ready for the final observation and that additional trips and observations are required to bring the project to completion, the costs incurred by the Architect/Engineers for additional time and expenses will be deducted from the Contractor's contract retainage prior to final payment at the completion of the job.

END OF SECTION 220500

SECTION 22 05 05
PLUMBING DEMOLITION FOR REMODELING

SECTION 22 05 05 - PLUMBING DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Mechanical Demolition.
- B. Cutting and Patching.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment shall be as specified in individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. THE DRAWINGS ARE INTENDED TO INDICATE THE GENERAL SCOPE OF WORK AND DO NOT SHOW EVERY PIPE, DUCT, OR PIECE OF EQUIPMENT THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY CONDITIONS PRIOR TO SUBMITTING A BID.
- B. Where walls, ceilings, etc., are shown as being removed on general drawings, the Contractor shall remove all mechanical equipment, devices, fixtures, piping, ducts, systems, etc., from the removed area.
- C. Where ceilings, walls, partitions, etc., are temporarily removed and replaced by others, This Contractor shall remove, store, and replace equipment, devices, fixtures, pipes, ducts, systems, etc.
- D. Verify that abandoned utilities serve only abandoned equipment or facilities. Extend services to facilities or equipment that shall remain in operation following demolition.
- E. Coordinate work with all other Contractors and the Owner. Schedule removal of equipment to avoid conflicts.
- F. This Contractor shall verify all existing equipment sizes and capacities where equipment is scheduled to be replaced or modified, prior to ordering new equipment.
- G. Bid submittal shall mean the Contractor has visited the project site and verified existing conditions and scope of work.

3.2 PREPARATION

- A. Disconnect plumbing systems in walls, floors, and ceilings scheduled for removal.
- B. Provide temporary connections to maintain existing systems in service during construction. When work must be performed on operating equipment, use personnel experienced in such operations.

SECTION 22 05 05
PLUMBING DEMOLITION FOR REMODELING

- C. Existing Plumbing System: Maintain service to all plumbing fixtures until new piping is installed. Obtain permission from Owner at least 48 hours before shutting down system for any reason. Make changeover to new piping with minimum outage. Do not disconnect any roof drainage piping until new piping is in place and operational.

3.3 DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK

- A. Demolish and extend existing plumbing work under provisions of Division 2 and this Section.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Remove abandoned piping to source of supply and/or main lines.
- D. Remove exposed abandoned pipes, including abandoned pipes above accessible ceilings. Cut pipes above ceilings, below floors and behind walls. Cap remaining lines. Repair building construction to match original. Remove all clamps, hangers, supports, etc. associated with pipe and duct removal.
- E. Disconnect and remove mechanical devices and equipment serving equipment that has been removed.
- F. Repair adjacent construction and finishes damaged during demolition and extension work.
- G. Extend existing installations using materials and methods compatible with existing installations, or as specified.
- H. Remove unused sections of domestic water piping back to mains and cap. Capped pipe shall be less than 2 feet from main to prevent "dead legs".
- I. Temporarily cap all openings to the sanitary and vent system to prevent odor from entering the work area and building.

3.4 CUTTING AND PATCHING

- A. This Contractor is responsible for all penetrations of existing construction required to complete the work of this project. Refer to Section 22 05 29 for additional requirements.
- B. Penetrations in existing construction should be reviewed carefully prior to proceeding with any work.
- C. Penetrations shall be neat and clean with smooth and/or finished edges. Core drill where possible for clean opening.
- D. Repair existing construction as required after penetration is complete to restore to original condition. Use similar materials and match adjacent construction unless otherwise noted or agreed to by the Architect/Engineer prior to start of work.
- E. Floor slabs may contain conduit systems. This Contractor is responsible for taking any measures required to ensure no conduits or other services are damaged. This includes X-ray or similar non-destructive means.
- F. This Contractor is responsible for all costs incurred in repair, relocations, or replacement of any cables, conduits, or other services if damaged without proper investigation.

SECTION 22 05 05
PLUMBING DEMOLITION FOR REMODELING

3.5 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment which remain or are to be reused.
- B. Clean all systems adjacent to project which are affected by the dust and debris caused by this construction.
- C. PLUMBING ITEMS REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE OWNER IN A LOCATION COORDINATED WITH THE OWNER. THE CONTRACTOR SHALL DISPOSE OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.

3.6 SPECIAL REQUIREMENTS

- A. Install temporary filter media over outside air intakes which are within 100 feet of the limits of construction or as noted on the drawings. This Contractor shall complete any cleaning required for existing systems which are affected by construction dust and debris.
- B. Review locations of all new penetrations in existing floor slabs or walls. Determine construction type and review for possible interferences. Bring all concerns to the attention of the Architect/Engineer before proceeding.

END OF SECTION 220505

SECTION 22 05 29
PLUMBING SUPPORTS AND ANCHORS

SECTION 22 05 29 - PLUMBING SUPPORTS AND ANCHORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Hangers, Supports, and Associated Anchors.
- B. Equipment Bases and Supports.
- C. Sleeves and Seals.
- D. Flashing and Sealing of Equipment and Pipe Stacks.
- E. Cutting of Openings.
- F. Escutcheon Plates and Trim.

1.2 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 22 05 00. Include plastic pipe manufacturers' support spacing requirements.

1.3 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

- A. Furnish sleeves and hanger inserts to General Contractor for placement into formwork.

PART 2 - PRODUCTS

2.1 HANGER RODS

- A. Hanger rods for single rod hangers shall conform to the following:
 - 1. Steel, Cast Iron, and Glass Pipe:
 - a. Hanger Rod Diameter:
 - 1) 2-1/2" and smaller: 3/8"
 - 2) 3" through 3-5/8": 3/8"
 - 3) 4" through 6": 1/2"
 - 2. Copper and Plastic Pipe:
 - a. Hanger Rod Diameter:
 - 1) 2-1/2" and smaller: 3/8"
 - 2) 3" through 3-5/8": 3/8"
 - 3) 4" through 6": 1/2"
- B. Rods for double rod hangers may be reduced one size. Minimum rod diameter is 3/8 inches.
- C. Hanger rods and accessories used in mechanical spaces or otherwise dry areas shall have ASTM B633 electro-plated zinc finish.

SECTION 22 05 29
PLUMBING SUPPORTS AND ANCHORS

- D. All hanger rods, nuts, washers, clevises, etc., in damp areas shall have ASTM A123 hot-dip galvanized finish applied after fabrication. This applies to the following areas:

2.2 PIPE AND STRUCTURAL SUPPORTS

A. General:

1. Pipe hangers, clamps, and supports shall conform to Manufacturers Standardization Society MSS SP-58, 69, 89, and 127 (where applicable).
2. On all insulated piping, provide at each support an insert of same thickness and contour as adjoining insulation, between the pipe and insulation jacket, to prevent insulation from sagging and crushing. Refer to insulation specifications for materials and additional information.
3. Copper piping located in an exposed area, including indirect waste piping in kitchens and janitor's closets, shall use split ring standoff hangers for copper tubing. Support shall include plastic pipe insert similar to Unistrut Cush-A-Clamp, Hydra-Zorb, nVent Cushion Clamp or Eaton Vibra-Clamp. Use electro-galvanized or more corrosion resistant and threaded rod for floor applications. Use anchors applicable to the wall type with corrosion resistant threaded rod for wall applications.

a. Products:

- 1) nVent/M-Co Model #456
- 2) Eaton Fig. 3198HCT
- 3) Anvil Fig. CT138R

B. Vertical Supports:

1. Support and laterally brace vertical pipes at every floor level in multi-story structures, unless otherwise noted by applicable codes, but never at intervals over 15 feet. Support vertical pipes with riser clamps installed below hubs, couplings, or lugs. Provide sufficient flexibility to accommodate expansion and contraction to avoid compromising fire barrier penetrations or stressing piping at fixed takeoff locations.

a. Products:

- 1) Eaton Fig B3373 Series
- 2) nVent 510 Series
- 3) Anvil Fig. 90

2. Cold Pipe: Place restrained neoprene mounts beneath vertical pipe riser clamps to prevent sweating of cold pipes. Select neoprene mounts based on the weight of the pipe to be supported. Insulate over mounts.

a. Products:

- 1) Mason RBA, RCA or RDA
- 2) Mason BR

SECTION 22 05 29
PLUMBING SUPPORTS AND ANCHORS

3. Cold Pipe Alternative: Insulated pipe riser clamp with no thermal bridging between clamp and pipe; water repellant calcium silicate insulation material adhered inside the clamp; ASTM A653 galvanized steel clamp.
 - a. Products:
 - 1) Pipeshields E100
 4. Wall supports shall be used where vertical height of structure exceeds minimum spacing requirements. Install wall supports at same spacing as hangers or strut supports along vertical length of pipe runs. Wall supports shall be coordinated with the Structural Engineer.
 5. Masonry Anchors: Fasten to concrete masonry units with expansion anchors or self-tapping masonry screws. For expansion anchors into hollow concrete block, use sleeve-type anchors designed for the specific application. Do not fasten in masonry joints. Do not use powder actuated fasteners, wooden plugs, or plastic inserts.
- C. Hangers and Clamps:
1. Oversize all hangers, clamps, and supports on insulated piping to allow insulation and jacket to pass through unbroken. This applies to both hot and cold pipes.
 2. Hangers in direct contact with bare copper pipe shall include plastic pipe insert similar to Unistrut Cush-A-Clamp, Hydra-Zorb, nVent Cushion Clamp or Eaton Vibra-Clamp within their temperature limits of -65°F to +275°F.
 3. Vertical cold pipe drops and rough-ins to fixtures shall be supported by insulated pipe clamps to prevent thermal bridging and condensation.
 4. On all insulated piping, provide a semi-cylindrical metallic shield and vapor barrier jacket.
 5. Ferrous hot piping 4 inches and larger shall have steel saddles tack welded to the pipe at each support with a depth not less than specified for the insulation. Factory fabricated inserts may be used.
 - a. Products:
 - 1) Anvil Fig. 160, 161, 162, 163, 164, 165
 - 2) Eaton Fig. 3160, 3161, 3162, 3163, 3164, 3165
 - 3) nVent Model 630, 631, 632, 633, 634, 635
 6. Unless otherwise indicated, hangers shall be as follows:
 - a. Clevis Type: Bare Metal Pipe, Rigid Plastic Pipe, Insulated Cold Pipe, Insulated Hot Pipe - 3 inches & Smaller
 - 1) Products: Bare Steel Plastic or Insulated Pipe:
 - a) Anvil Fig. 260
 - b) Eaton Fig. 3100
 - c) nVent Model 400
 - 2) Products: Bare Copper Pipe Felt or PVC Coated:
 - a) Eaton Fig. B3104F or B3100CTC
 - b) Anvil Fig. CT65
 - c) nVent Fig. 402

SECTION 22 05 29
PLUMBING SUPPORTS AND ANCHORS

- b. Adjustable Swivel Ring Type: Bare Metal Pipe - 4 inches and Smaller
 - 1) Products: Bare Steel Pipe:
 - a) Anvil Fig. 69
 - b) Eaton Fig. B3170NF
 - c) nVent Model 115
 - 2) Products: Bare Copper Pipe:
 - a) Eaton Fig. B3170CTC
 - b) nVent 102A0 Series
 - c) Anvil Fig. CT-69
- 7. Support may be fabricated from U-channel strut or similar shapes. Piping less than 4" in diameter shall be secured to strut with clamps of proper design and capacity as required to maintain spacing and alignment. Strut shall be independently supported from hanger drops or building structure. Size and support shall be per manufacturer's installation requirements for structural support of piping. Clamps shall not interrupt piping insulation.
 - a. Strut used in mechanical spaces or otherwise dry areas shall have ASTM B633 electro-plated zinc finish.
 - b. Strut used in damp areas listed in hanger rods shall have ASTM A123 hot-dip galvanized finish applied after fabrication.
- 8. Unless otherwise indicated, pipe supports for use with struts shall be as follows:
 - a. Clamp Type: Bare Metal Pipe, Rigid Plastic Pipe, Insulated Cold Pipe, Insulated Hot Pipe - 3 inches and smaller
 - 1) Clamps in direct contact with copper pipe shall include plastic pipe insert similar to Unistrut Cush-A-Clamp, Hydra-Zorb, nVent Cushion Clamp or Eaton Vibra-Clamp.
 - 2) Pipes subject to expansion and contraction shall have clamps oversized to allow limited pipe movement.
 - 3) Products: Bare Steel, Plastic or Insulated Pipe:
 - a) Unistrut Fig. P1100 or P2500
 - b) Eaton Fig. B2000 or B2400
 - c) Anvil Fig. AS1200
 - d) nVent USC
 - 4) Products: Bare Copper Pipe:
 - a) Eaton Fig. BVT
 - b) nVent CADDY Cushion Clamp

SECTION 22 05 29
PLUMBING SUPPORTS AND ANCHORS

D. Upper (Structural) Attachments:

1. Unless otherwise shown, upper attachments for hanger rods or support struts shall be as follows:
 - a. Steel Structure Clamps: C-Type Wide Flange Beam Clamps (for use on top and/or bottom of wide flanges. Not permitted for use with bar-joists.):
 - 1) Products:
 - a) Anvil Fig. 86
 - b) Eaton Fig. B3033/B3034
 - c) nVent Model 300 & 310
 - b. Steel Structure Clamps: Scissor Type Beam Clamps (for use with bar-joists and wide flange):
 - 1) Products:
 - a) Anvil Fig. 228, 292
 - b) Eaton Fig. B3054
 - c) nVent Model 360
 - c. Concentrically Loaded Open Web Joist Hangers (for use with bar joists):
 - 1) Products:
 - a) MCL. M1, M2 or M3
 - d. Concrete Anchors: Fasten to concrete using cast-in or post-installed anchors designed per the requirements of Appendix D of ACI 318-05. Post-installed anchors shall be qualified for use in cracked concrete by ACI-355.2.
 - e. Masonry Anchors: Fasten to concrete masonry units with expansion anchors or self-tapping masonry screws. For expansion anchors into hollow concrete block, use sleeve-type anchors designed for the specific application. Do not fasten in masonry joints. Do not use powder actuated fasteners, wooden plugs, or plastic inserts.
 - f. Steel Structure Welding:
 - 1) Unless otherwise noted, hangers, clips, and auxiliary support steel may be welded in lieu of bolting, clamping, or riveting to the building structural frame. Take adequate precautions during all welding operations for fire prevention and protecting walls and ceilings from smoke damage.

2.3 FOUNDATIONS, BASES, AND SUPPORTS

A. Basic Requirements:

1. Furnish and install foundations, bases, and supports (not specifically indicated on the Drawings or in the Specifications of either the General Construction or Mechanical work as provided by another Contractor) for mechanical equipment.
2. All concrete foundations, bases and supports, shall be reinforced. All steel bases and supports shall receive a prime coat of zinc chromate or red metal primer. After completion of work, give steel supports a final coat of gray enamel.

SECTION 22 05 29
PLUMBING SUPPORTS AND ANCHORS

B. Supports:

1. Provide sufficient clips, inserts, hangers, racks, rods, and auxiliary steel to securely support all suspended material, equipment and conduit without sag.
2. Hang heavy equipment from concrete floors or ceilings with Architect/Engineer-approved concrete inserts, furnished and installed by the Contractor whose work requires them, except where indicated otherwise.

C. Grout:

1. Grout shall be non-shrinking premixed (Master Builders Company "Embecco"), unless otherwise indicated on the drawings or approved by the Architect/Engineer.
2. Use Mix No. 1 for clearances of 1" or less, and Mix No. 2 for all larger clearances.
3. Grout under equipment bases, around pipes, at pipe sleeves, etc., and where shown on the drawings.

2.4 OPENINGS IN FLOORS, WALLS AND CEILINGS

- A. Exact locations of all openings for the installation of materials shall be determined by the Contractor and given to the General Contractor for installation or construction as the structure is built.
- B. Coordinate all openings with other Contractors.
- C. Hire the proper tradesman and furnish all labor, material and equipment to cut openings in or through existing structures, or openings in new structures that were not installed, or additional openings. Repair all spalling and damage to the satisfaction of the Architect/Engineer. Make saw cuts before breaking out concrete to ensure even and uniform opening edges.
- D. Said cutting shall be at the complete expense of each Contractor. Failure to coordinate openings with other Contractors shall not exempt the Contractor from providing openings at Contractor's expense.
- E. Do not cut structural members without written approval of the Architect or Structural Engineer.
- F. Exposed Housing Penetrations: Seal pipes with surface temperature below 150°F, penetrating housings with conical stepped, white silicone, EPDM or neoprene pipe flashings and stainless steel clamps equal to Portals Plus Pipe Boots or Pipetite.

2.5 ROOF PENETRATIONS

- A. Roof Curb Enclosure: Provide weatherproof roof curb and enclosure for pipe penetrations. Refer to drawings for details.
- B. Conical Pipe Boot: Seal pipes with surface temperature below 150°F penetrating single-ply roofs with conical stepped, UV-resistant silicone, EPDM or neoprene pipe flashings and stainless steel clamps equal to Portals Plus Pipe Boots or Pipetite. Color: White shall match roofing membrane.
- C. Break insulation only at the clamp for pipes between 60°F and 150°F. Seal outdoor insulation edges watertight.

2.6 SLEEVES AND LINTELS

- A. Each Contractor shall provide sleeves and lintels for all duct and pipe openings required for the Contractor's work in masonry walls and floors, unless specifically shown as being by others.

SECTION 22 05 29
PLUMBING SUPPORTS AND ANCHORS

- B. Fabricate all sleeves from standard weight black steel pipe or as indicated on the drawings. Provide continuous sleeve. Cut or split sleeves are not acceptable.
- C. Fabricate all lintels for masonry walls from structural steel shapes or as indicated on the drawings. Have all lintels approved by the Architect or Structural Engineer.
- D. Sleeves through the floors on exposed risers shall be flush with the ceiling, with planed squared ends extending 1" above the floor in unfinished areas, and flush with the floor in finished areas, to accept spring closing floor plates.
- E. Sleeves shall not penetrate structural members or masonry walls without approval from the Structural Engineer. Sleeves shall then comply with the Architect/Engineer's design.
- F. Openings through unexcavated floors and/or foundation walls below the floor shall have a smooth finish with sufficient annular space around material passing through opening so slight settling will not place stress on the material or building structure.
- G. Install all sleeves concentric with pipes. Secure sleeves in concrete to wood forms. This Contractor is responsible for sleeves dislodged or moved when pouring concrete.
- H. Where pipes rise through concrete floors that are on earthen grade, provide 3/4" resilient expansion joint material (e.g., foam, rubber, asphalt-coated fiber, bituminous-impregnated felt, or cork) wrapped around the pipe, the full depth of concrete, at the point of penetration. Secure to prevent shifting during concrete placement and finishing.
- I. Size sleeves large enough to allow expansion and contraction movement. Provide continuous insulation wrapping.
- J. Wall Seals ("Link-Seals"):
 - 1. Where shown on the drawings, pipes passing through walls, ceilings, or floors shall have their annular space (sleeve or drilled hole - not tapered hole made with knockout plug) sealed by properly sized sealing elements consisting of a synthetic rubber material compounded to resist aging, ozone, sunlight, water and chemical action.
 - 2. Sleeves, if used, shall be standard weight steel with primed finish and waterstop/anchor continuously welded to sleeve. If piping carries only fluids below 120°F, sleeves may be thermoplastic with integral water seal and textured surface.
 - 3. Sleeves shall be at least 2 pipe sizes larger than the pipes.
 - 4. Pressure shall be maintained by stainless steel bolts and other parts. Pressure plates may be of composite material for Models S and OS.
 - 5. Sealing element shall be as follows:

		Element	
Model	Service	Material	Temperature Range
S	Standard (Stainless)	EPDM	-40°F to 250°F
T	High/Low Temperature (Steam)	Silicone	-67°F to 400°F
T	Fire Seals (1 hour)	Silicone	-67°F to 400°F
FS	Fire Seals (3 hours)	Silicone	-67°F to 400°F
OS	Oil Resistant/Stainless	Nitrile	-40°F to 210°F

- 6. Manufacturers:
 - a. Thunderline Corporation "Link-Seals"
 - b. O-Z/Gedney Company
 - c. Calpico, Inc.
 - d. Innerlynx

SECTION 22 05 29
PLUMBING SUPPORTS AND ANCHORS

- e. Metraflex Company (cold service only)
- f. Polywater PHSD

2.7 ESCUTCHEON PLATES AND TRIM

- A. Fit escutcheons to all insulated or uninsulated exposed pipes passing through walls, floors, or ceilings of finished rooms.
- B. Escutcheons shall be heavy gauge, cold rolled steel, copper coated under a chromium plated finish, heavy spring clip, rigid hinge and latch.
- C. Install galvanized steel (unless otherwise indicated) trim strip to cover vacant space and raw construction edges of all rectangular openings in finished rooms. This includes pipe openings.

2.8 PIPE PENETRATIONS

- A. Seal all pipe penetrations. Seal non-rated walls and floor penetrations with grout or caulk. Backing material may be used.
- B. Seal fire rated wall and floor penetrations with fire seal system as specified.

2.9 PIPE ANCHORS

- A. Provide all items needed to allow adequate expansion and contraction of all piping. All piping shall be supported, guided, aligned, and anchored as required.
- B. Repair all piping leaks and associated damage. Pipes shall not rub on any part of the building.

2.10 FINISH

- A. Prime coat exposed steel hangers and supports. Hangers and supports in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

PART 3 - EXECUTION

3.1 PLUMBING SUPPORTS AND ANCHORS

- A. General Installation Requirements:
 - 1. Install all items per manufacturer's instructions.
 - 2. Coordinate the location and method of support of piping systems with all installations under other Divisions and Sections of the Specifications.
 - 3. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
 - 4. Supports shall extend directly to building structure. Do not support piping from duct hangers unless coordinated with Sheet Metal Contractor prior to installation. Do not allow lighting or ceiling supports to be hung from piping supports.
- B. Supports Requirements:
 - 1. Where building structural steel is fireproofed, all hangers, clamps, auxiliary steel, etc., which attach to it shall be installed prior to application of fireproofing. Repair all fireproofing damaged during pipe installation.
 - 2. Set all concrete inserts in place before pouring concrete.

SECTION 22 05 29
PLUMBING SUPPORTS AND ANCHORS

3. Furnish, install and prime all auxiliary structural steel for support of piping systems that are not shown on the Drawings as being by others.
 4. Install hangers and supports complete with lock nuts, clamps, rods, bolts, couplings, swivels, inserts and required accessories.
 5. Hangers for horizontal piping shall have adequate means of vertical adjustment for alignment.
- C. Pipe Requirements:
1. Support all piping and equipment, including valves, strainers, traps and other specialties and accessories to avoid objectionable or excessive stress, deflection, swaying, sagging or vibration in the piping or building structure during erection, cleaning, testing and normal operation of the systems.
 2. Do not, however, restrain piping to cause it to snake or buckle between supports or to prevent proper movement due to expansion and contraction.
 3. Support piping at equipment and valves so they can be disconnected and removed without further supporting the piping.
 4. Piping shall not introduce strains or distortion to connected equipment.
 5. Parallel horizontal pipes may be supported on trapeze hangers made of structural shapes and hanger rods; otherwise, pipes shall be supported with individual hangers.
 6. Trapeze hangers may be used where ducts interfere with normal pipe hanging.
 7. Provide additional supports where pipe changes direction, adjacent to flanged valves and strainers, at equipment connections and heavy fittings.
 8. Provide at least one hanger adjacent to each joint in grooved end steel pipe with mechanical couplings.
- D. Provided the installation complies with all loading requirements of truss and joist manufacturers, the following practices are acceptable:
1. Loads of 100 lbs. or less may be attached anywhere along the top or bottom chords of trusses or joists with a minimum 3' spacing between loads.
 2. Loads greater than 100 lbs. must be hung concentrically and may be hung from top or bottom chord, provided one of the following conditions is met:
 - a. The hanger is attached within 6" from a web/chord joint.
 - b. Additional L2x2x1/4 web reinforcement is installed per manufacturer's requirements.
 3. It is prohibited to cantilever a load using an angle or other structural component that is attached to a truss or joist in such a fashion that a torsional force is applied to that structural member.
 4. If conditions cannot be met, coordinate installation with truss or joist manufacturer and contact Architect/Engineer.
- E. After piping and insulation installation are complete, cut hanger rods back at trapeze supports so they do not extend more than 3/4" below bottom face of lowest fastener and blunt any sharp edges.
- F. Do not exceed 25 lbs. per hanger and a minimum spacing of 2'-0" on center when attaching to metal roof decking (limitation not required with concrete on metal deck). This 25 lbs. load and 2'-0" spacing include adjacent electrical and architectural items hanging from deck. If the hanger restrictions cannot be achieved, supplemental framing off steel framing will need to be added.
- G. Do not exceed the manufacturer's recommended maximum load for any hanger or support.

SECTION 22 05 29
PLUMBING SUPPORTS AND ANCHORS

H. Steel/Concrete Structure: Spacing of hangers shall not exceed the compressive strength of the insulation inserts, and in no case shall exceed the following:

1. Steel and Fiberglass (Std. Weight or Heavier - Liquid Service):

a. Maximum Spacing:

- 1) 1-1/4" & under: 7'-0"
- 2) 1-1/2": 9'-0"
- 3) 2": 10'-0"
- 4) 2-1/2": 11'-0"
- 5) 3": 12'-0"
- 6) 4" & larger: 12'-0"

2. Steel (Std. Weight or Heavier - Vapor Service):

a. Maximum Spacing:

- 1) 1-1/4" and under: 9'-0"
- 2) 1-1/2": 12'-0"
- 3) 2" & larger: 12'-0"

3. Hard Drawn Copper & Brass (Liquid Service):

a. Maximum Spacing:

- 1) 3/4" and under: 5'-0"
- 2) 1": 6'-0"
- 3) 1-1/4": 7'-0"
- 4) 1-1/2": 8'-0"
- 5) 2": 8'-0"
- 6) 2-1/2": 9'-0"
- 7) 3": 10'-0"
- 8) 4": 12'-0"
- 9) 6": 12'-0"

4. Hard Drawn Copper & Brass (Vapor Service):

a. Maximum Spacing:

- 1) 3/4" & under: 7'-0"
- 2) 1": 8'-0"
- 3) 1-1/4": 9'-0"
- 4) 1-1/2": 10'-0"
- 5) 2": 11'-0"
- 6) 2-1/2" & larger: 12'-0"

5. Plastic Pipe:

a. Hangers shall be spaced based on the piping system manufacturer's instructions or, if no system instructions are available, space hangers at 4'-0" maximum centers.

I. Installation of hangers shall conform to MSS SP-58, 69, 89 and the applicable Plumbing Code.

END OF SECTION 220529

SECTION 22 05 53
PLUMBING IDENTIFICATION

SECTION 22 05 53 - PLUMBING IDENTIFICATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Identification of products installed under Division 22.

1.2 SUBMITTALS

- A. Submit shop drawings under provisions of Section 22 05 00. Include list of items identified, wording, letter sizes, and color coding.
- B. Include valve chart and schedule listing valve tag number, location, function, and valve manufacturer's name and model number.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- 1. 3M
- 2. Bunting
- 3. Calpico
- 4. Craftmark
- 5. Emedco
- 6. Kolbi Industries
- 7. Seton
- 8. W.H. Brady
- 9. Marking Services

2.2 MATERIALS

- A. All pipe markers (purchased or stenciled) shall conform to ANSI A13.1. Marker lengths and letter sizes shall be at least the following:

OD of Pipe or Insulation	Marker Length	Size of Letters
Up to and including 1-1/4"	8"	1/2"
1-1/2" to 2"	8"	3/4"
2-1/2" to 6"	12"	1-1/4"
Plastic tags may be used for outside diameters under 3/4"		

- B. Plastic Nameplates: Laminated three-layer phenolic with engraved black, 1/4" minimum letters on light contrasting background.
- C. Plastic Tags: Minimum 1-1/2" square or round laminated three-layer phenolic with engraved, 1/4" minimum black letters on light contrasting background.
- D. Plastic Pipe Markers: Semi-rigid plastic, preformed to fit around pipe or pipe covering; indicating flow direction and fluid conveyed.
- E. Vinyl Pipe Markers: Colored vinyl with permanent pressure sensitive adhesive backing.

SECTION 22 05 53
PLUMBING IDENTIFICATION

- F. Underground Pipe Markers: Bright colored continuously printed plastic ribbon tape 6" wide by 3.5 mils thick, manufactured for direct burial, with aluminum foil core for location by non-ferric metal detectors and bold lettering identifying buried item.
- G. Tracer Wire:
 - 1. Single copper conductors shall be solid or stranded annealed or hard uncoated copper per UL83 and ASTM requirements. Tracer tape or copper-coated steel wire is not acceptable.
 - 2. Conductor shall be insulated with HMWPE as specified and applied in a concentric manner. The minimum at any point shall not be less than 90% of the specified average thickness in compliance with UL 83.
 - 3. Tracer wire shall be continuously spark tested at 7500 Volts DC. Other electrical and mechanical tests shall be in accordance with UL 1581.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install all products per manufacturer's recommendations.
- B. Degrease and clean surfaces to receive adhesive for identification materials.
- C. Valves:
 - 1. All valves (except shutoff valves at equipment) shall have numbered tags.
 - 2. Provide or replace numbered tags on all existing valves that are connected to new systems or that have been revised.
 - 3. Provide all existing valves used to extend utilities to this project with numbered tags. Review tag numbering sequence with the Owner prior to ordering tags.
 - 4. Secure tags with heavy duty key chain and brass "S" link or with mechanically fastened plastic straps.
 - 5. Attach to handwheel or around valve stem.
 - 6. Number all tags and show the service of the pipe.
 - 7. Provide one Plexiglas framed valve directory listing all valves, with respective tag numbers, uses and locations. Mount directory in location chosen by the Architect/Engineer.
 - 8. Provide one 36" x 24" minimum Plexiglas framed piping schematic showing valve locations with respective tag numbers. Mount directory in location chosen by the Architect/Engineer.
 - 9. Provide two sets of laminated 8-1/2" x 11" (letter size) copies of a valve directory listing all valves, with respective tag numbers, uses, and locations. The directory shall be reviewed by the Owner and Architect/Engineer prior to laminating final copies. Laminated copies shall have brass eyelet in at least one corner for easy hanging.
- D. Pipe Markers:
 - 1. Adhesive Backed Markers: Use Brady Style 1, 2, or 3 on pipes 3" diameter and larger. Use Brady Style 4, 6, or 8 on pipes under 3" diameter. Similar styles by other listed manufacturers are acceptable. Secure all markers at both ends with a wrap of pressure sensitive tape completely around the pipe.
 - 2. Snap-on Markers: Use Seton "Setmark" on pipes up to 5-7/8" OD. Use Seton "Setmark" with nylon or Velcro ties for pipes 6" OD and over. Similar styles by other listed manufacturers are acceptable.

SECTION 22 05 53
PLUMBING IDENTIFICATION

3. Apply markers and arrows in the following locations where clearly visible:
 - a. At each valve.
 - b. On both sides of walls that pipes penetrate.
 - c. At least every 20 feet along all pipes.
 - d. On each riser and each leg of each "T" joint.
 - e. At least once in every room and each story traversed.
4. Underground Pipe Markers: Install 8" to 10" below grade, directly above buried pipes.

E. Equipment:

1. All equipment not easily identifiable such as controls, relays, gauges, etc.; and all equipment in an area remote from its function shall have nameplates or plastic tags listing name, function, and drawing symbol. Do not label exposed equipment in public areas.
2. Provide engraved plastic tags at all hydronic or steam system makeup water meters.
3. Mechanical equipment that is not covered by the U.S. National Appliance Energy Conservation Act (NAECA) of 1987 shall carry a permanent label installed by the manufacturer stating that the equipment complies with the requirements of ASHRAE 90.1.

F. Tracer Wire:

1. Tracer wire shall be installed on top of all non-metallic buried utilities.
2. Tracer wire shall be taped directly to plastic water or drain pipe.
3. Tracer wire shall not be fastened directly or indirectly to gas piping.
4. Tracer wire when attached shall be secured to the pipe a minimum of every 10 feet and at all changes of direction.
5. Tape shall be Polyken "930-35", Protecto-Wrap "310", or approved equal.
6. Tracer wire shall be continuous between boxes and shall be tested for continuity.
7. Splices in tracer wire shall be made with a water proof splice kit to prevent corrosion. Wire nuts shall not be used.
8. The tracer wire shall daylight to grade through a 2" PVC conduit, at the point of the utility entrance to building. PVC conduit shall be capped and labeled as future contact point to locate the utility.

3.2 SCHEDULE

A. Pipes to be marked shall be labeled with text as follows, regardless of which method or material is used:

1. DOMESTIC COLD WATER: White lettering; green background
2. DOMESTIC HOT WATER - 115°F: White lettering; green background
3. DOMESTIC HOT WATER - 140°F: White lettering; green background
4. DOMESTIC HOT WATER CIRCULATING - 115°F: White lettering; green background
5. DOMESTIC HOT WATER CIRCULATING - 140°F: White lettering; green background
6. SANITARY SEWER: Black lettering; yellow background
7. VENT: Black lettering; yellow background
8. All Underground Pipes: Varies
9. Tracer Wire - All other buried types: White lettering; green background

END OF SECTION 220553

SECTION 22 07 19
PLUMBING PIPING INSULATION

SECTION 22 07 19 - PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Piping Insulation.
- B. Insulation Jackets.

1.2 QUALITY ASSURANCE

- A. Applicator: Company specializing in piping insulation application with five years minimum experience.
- B. Materials: Listed and labeled for flame spread/smoke developed rating of no more than 25/50 when tested per ASTM E84 or UL 723 as required by code. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers with appropriate markings of applicable testing agency.
- C. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- D. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

1.3 SUBMITTALS

- A. Submit shop drawings per Section 22 05 00. Include product description, list of materials and thickness for each service, and locations.

PART 2 - PRODUCTS

2.1 INSULATION

- A. Type B: Flexible elastomeric foam insulation; closed-cell, sponge or expanded rubber (polyethylene type is not permitted); ANSI/ASTM C534 Grade 1 Type I for tubular materials; flexible plastic; 0.25 maximum 'K' value at 75°F, listed and labeled at no more than 25/50 when tested per ASTM E84 or UL 723 as required by code. Maximum 1" thick per layer where multiple layers are specified.
- B. Type C: Molded rigid cellular glass; ANSI/ASTM C-552; 0.29 maximum 'K' value at 75°F; density 7.3lb/ft; minimum compressive strength 90 psi parallel to rise; moisture resistant, non-combustible; suitable for -100°F to +900°F. For below grade installations, use asphaltic mastic paper vapor barrier jacket. Use self-seal all-purpose polymer or polypropylene service jacket for above grade installations.

SECTION 22 07 19
PLUMBING PIPING INSULATION

- C. Type E: Preformed rigid cellular polyisocyanurate insulation; ANSI/ASTM C591; maximum 'K' value of 0.19 at 75°F; density 4.0lb/ft; minimum compressive strength 95 psi parallel to rise; moisture resistant; listed and labeled at no more than 25/50 when tested per ASTM E84 or UL 723 as required by code; suitable for -297°F to +300°F.

2.2 VAPOR BARRIER JACKETS

- A. All-purpose polymer or polypropylene service jacket vapor barrier with self-sealing adhesive joints. Beach puncture resistance ratio of at least 50 units. Tensile strength: 35 psi minimum. Single, self-seal acrylic adhesive on longitudinal jacket laps and butt strips.
- B. Polyvinylidene Chloride (PVDC or Saran) film and tape: Durable and highly moisture and moisture vapor resistant. Please refer to manufacturer's recommended installation guidelines.

2.3 JACKET COVERINGS

- A. Plastic Jackets and Fitting Covers: High impact, glossy white, 0.030" thick, self-extinguishing plastic. Suitable for use indoors or outdoors with ultraviolet inhibitors. Suitable for -40°F to 150°F. Listed and labeled at no more than 25/50 when tested per ASTM E84 or UL 723 as required by code.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Install insulation after piping has been tested. Pipe shall be clean, dry and free of rust before applying insulation.

3.2 INSTALLATION

- A. General Installation Requirements:
 - 1. Install materials per manufacturer's instructions, building codes and industry standards.
 - 2. Continue insulation with vapor barrier through penetrations. This applies to all insulated piping. Maintain fire rating of all penetrations.
- B. Insulated Piping Operating Below 60°F:
 - 1. Insulate fittings, valves, unions, flanges, strainers, flexible connections, flexible hoses, and expansion joints. Seal all penetrations of vapor barrier.
 - 2. On piping operating below 60°F in locations that are not mechanically cooled (e.g., penthouses, mechanical rooms, tunnels, chases at exterior walls, etc.), Type B insulation shall be used.
 - 3. All balance valves with fluid operating below 60°F shall be insulated with a removable plug wrapped with vapor barrier tape to allow reading and adjusting of the valve.
- C. Insulated Piping Operating Between 60°F and 140°F:
 - 1. Do not insulate flanges and unions, but bevel and seal ends of insulation at such locations. Insulate all fittings, valves and strainers.
- D. Insulated Piping Operating Above 140°F:
 - 1. Insulate fittings, valves, flanges, and strainers.

SECTION 22 07 19
PLUMBING PIPING INSULATION

2. All balance valves with fluid operating above 140°F shall be insulated and an opening shall be left in the insulation to allow for reading and adjusting the valve.

E. Exposed Piping:

1. Locate and cover seams in least visible locations.
2. Where exposed insulated piping extends above the floor, provide a sheet metal guard around the insulation extending 12" above the floor. Guard shall be 0.016" cylindrical smooth or stucco aluminum and shall fit tightly to the insulation.
3. On exposed piping serving kitchen equipment or plumbing fixtures, the piping shall be insulated unless local code allows it to be uninsulated. In no instance should the uninsulated portion of the piping be more than 4ft in developed length.

3.3 SUPPORT PROTECTION

- A. Provide a shield on all insulated piping at each support between the insulation jacket and the support.

- B. On all insulated piping greater than 1-1/2", provide shield with insulation insert of same thickness and contour as adjoining insulation at each support, between the pipe and insulation jacket, to prevent insulation from sagging and crushing. Inserts shall be as follows:

1. The insert shall be suitable for planned temperatures, be suitable for use with specific pipe material, and shall be a minimum 180° cylindrical segment the same length as metal shields. Inserts shall be:
 - a. Cellular glass (Type C) (for all temperature ranges) with a minimum compressive strength of 90 psi is acceptable for pipe sizes 14" and below. For pipe sizes larger than 14", provide rolled steel plate in addition to the shield.
 - b. Polyisocyanurate insulation (Type E) (for pipes below 300°F with a minimum compressive strength of 24 psi is acceptable for pipe sizes 3" and below, minimum 60 psi for pipe sizes 4" to 10". For pipe sizes larger than 10", provide rolled steel plate in addition to the shield Where insulation is installed on piping located within return air plenums and mechanical rooms, insulation shall be listed and labeled at no more than 25/50 when tested per ASTM E84 or UL 723 as required by code.
 - c. Polyisocyanurate insulation (for pipes below 300°F with a minimum compressive strength of 24 psi is acceptable for pipe sizes 3" and below, minimum 60 psi for pipe sizes 4" to 10". For pipe sizes larger than 10", provide rolled steel plate in addition to the shield Where insulation is installed on piping located within return air plenums and mechanical rooms, insulation shall be listed and labeled at no more than 25/50 when tested per ASTM E84 or UL 723 as required by code.
 - d. As an alternative to separate pipe insulation insert and saddle, properly sized manufactured integral rigid insulation insert and shield assemblies may be used.

1) Products:

- a) Buckaroo CoolDry
- b) Cooper/B-Line Fig. B3380 through B3384
- c) Pipe Shields A1000, A2000

e. Insulation Couplings:

- 1) Molded thermoplastic slip coupling, -65°F to 275°F, sizes up to 4-1/8" OD, and receive insulation thickness up to 1". Suitable for use indoors or outdoors with UV stabilizers. Vertical insulation riser clamps shall have a 1,000lb vertical load rating. On cold pipes operating below 60°F, cover joint and coupling with vapor barrier mastic to ensure continuous vapor barrier.

SECTION 22 07 19
PLUMBING PIPING INSULATION

- 2) PET thermoplastic foam load bearing core with elastomeric foam ends and lap-seal jacket.
- 3) Horizontal Strut Mounted Insulated Pipe Manufacturers:
 - a) Klo-Shure or equal
 - b) Armafix Ecolight

- 4) Vertical:
 - a) Manufacturers: Klo-Shure Titan or equal

- f. Rectangular blocks, plugs, or wood material are not acceptable.
- g. Temporary wood blocking may be used by the Piping Contractor for proper height; however, these must be removed and replaced with proper inserts by the Insulation Contractor. Refer to Supports and Anchors specification section for additional information.

C. Neatly finish insulation at supports, protrusions, and interruptions.

D. Install metal shields between all hangers or supports and the pipe insulation. Shields shall be galvanized sheet metal, half-round with flared edges. Adhere shields to insulation. On cold piping, seal the shields vapor-tight to the insulation as required to maintain the vapor barrier, or add separate vapor barrier jacket.

E. Shields shall be at least the following lengths and gauges:

Pipe Size	Shield Size
1/2" to 3-1/2"	12" long x 18 gauge
4"	12" long x 16 gauge
5" to 6"	18" long x 16 gauge
8" to 14"	24" long x 14 gauge
16" to 24"	24" long x 12 gauge

F. Elastomeric foam insulation shields/saddle; molded thermoplastic rigid pipe saddle sized for insulation outside diameter. Length as indicated above.

G. Ferrous hot piping 4 inches and larger, provide steel saddle at rollers as described in Section 22 05 29 "Plumbing Supports and Anchors".

H. Minimum 1/4" rolled galvanized steel plates shall be provided in addition to the sleeves as reinforcement on large pipes to reduce point loading on roller, trapeze hanger and strut support locations depending on insulation compressive strength. Refer to section above for exact locations.

3.4 INSULATION

A. Type B Insulation:

- 1. Install per manufacturer's instructions or ASTM C1710.

SECTION 22 07 19
PLUMBING PIPING INSULATION

2. Elastomeric Cellular Foam: Where possible, slip insulation over the open end of pipe without slitting. Seal all butt ends, longitudinal seams, and fittings with adhesive. At elbows and tees, use mitered connections. Do not compress or crush insulation at cemented joints. Joints shall be sealed completely and not pucker or wrinkle. Exterior installations shall contain factory applied polymeric, moisture, and UV resistant covering with ends sealed with adhesive and similar cover; or Contractor shall paint the outside of outdoor insulation with two coats of latex enamel paint recommended by the manufacturer.
 3. Insulation Installation on Straight Pipes and Tubes:
 - a. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
 - b. Insulation must be installed in compression to allow for expansion and contraction. Insulation shall be pushed onto the pipe, never pulled. Stretching of insulation may result in open seams and joints.
 4. Insulation Installation on Valves and Pipe Specialties:
 - a. Install preformed sections of same material as straight segments of pipe insulation when available.
 - b. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
 - c. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
- B. Type C Insulation:
1. Seal all longitudinal joints with manufacturer approved adhesive. Secure butt joint strips in a similar manner.
 2. Insulate fittings with prefabricated fittings.
- C. Type E Insulation:
1. Indoors, above grade or below grade, Polyvinylidene chloride (PVDC or Saran) vapor retarder film and tape: Seal all longitudinal joints with manufacturer approved adhesive. Secure butt joint strips in a similar manner. Refer to manufacturer's recommendations for installation guidelines.
 2. Insulate pipe fittings with prefabricated insulation fittings.
- 3.5 JACKET COVER INSTALLATION
- A. Plastic Covering:
1. Provide vapor barrier as specified for insulation type. Cover with plastic jacket covering. Position seams to shed water.
 2. Solvent weld all joints with manufacturer recommended cement.
 3. Overlap all laps and butt joints 1-1/2" minimum. Repair any loose ends that do not seal securely. Solvent weld all fitting covers in the same manner. Final installation shall be watertight.
 4. All joints in areas noted shall meet USDA standards for Totally Sealed Systems, including overlaps of 1" on circumferential and 1.5" to 2" on longitudinal seams.
 5. Use plastic insulation covering on all exposed pipes including, but not limited to:
 - a. All exposed piping in finished spaces unless noted otherwise on the drawings.
 - b. All exposed piping in locker rooms.
 - c. All exposed piping in kitchen areas.

SECTION 22 07 19
PLUMBING PIPING INSULATION

- d. All exposed piping adjacent to cloud ceilings.
 - e. All exposed piping in unfinished areas as noted on drawings (e.g., storage rooms, janitor's closets, utility rooms, etc.).
 - f. All exposed piping in mechanical or equipment rooms below 8'-0" above floor.
 - g. All exposed piping in mechanical rooms that is subject to damage from normal operations. (Example: Piping that must be stepped over routinely.)
 - h. All exposed piping in tunnels designated as passageways, equipment access, or egress.
6. Elastomeric piping insulation may have two coats of latex paint instead of plastic jacket.

3.6 SCHEDULE

- A. Refer to drawings for insulation schedule.

END OF SECTION 220719

SECTION 22 10 00
PLUMBING PIPING

SECTION 22 10 00 - PLUMBING PIPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Pipe and Pipe Fittings.
- B. Valves.
- C. Check Valves.

1.2 QUALITY ASSURANCE

- A. Valves: Manufacturer's name and pressure rating marked on valve body. Remanufactured valves are not acceptable.
- B. Welding Materials and Procedures: Conform to ASME Code and applicable state labor regulations.
- C. Welders Certification: In accordance with ANSI/ASME Sec 9 or ANSI/AWS D1.1.
- D. Piping, Fittings, Valves, and Flux for Potable Water Systems: All components shall be lead free per Federal Act S.3874, Reduction of Lead in Drinking Water Act.

1.3 SUBMITTALS

- A. Submit shop drawings per Section 22 05 00.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store valves in shipping containers with labeling in place.

1.5 COORDINATION DRAWINGS

- A. Reference Coordination Drawings article in Section 22 05 00 for required plumbing systems electronic CAD drawings to be provided to Coordinating Contractor for inclusion into composite coordination drawings.

PART 2 - PRODUCTS

2.1 CAST IRON PIPE

- A. Cast Iron; Standard Weight; Hub and Spigot Joints:
 - 1. Pipe: Standard weight hub and spigot cast iron soil pipe, bituminous corrosion protective coating inside and outside, CISPI 301 and CISPI Trademark.
 - 2. Design Pressure: Gravity Maximum Design Temperature: 180°F
 - 3. Joints: Compression gasket, ASTM C564.
 - 4. Restraints: Install pipe and fittings per the Cast Iron Soil Pipe Institute's Designation 301. Restrain pipe and fittings using an engineered and tested product manufactured for restraining no-hub cast iron soil pipe. Install per manufacturer's recommendations.

SECTION 22 10 00 PLUMBING PIPING

5. Adapters: Heavy duty no-hub transition for joining cast iron and PVC pipe. Adapters shall be tested and certified to ASTM C 1460 and be constructed with Type 304 stainless steel shield, thickness 0.015" shield, gasket material to meet ASTM C564, 1-1/2" to 4" will be 3" wide with four 304 stainless steel bands, and 6" to 10" will be 4" wide with six 304 stainless steel bands and 3/8" 305 stainless steel hex head screws torqued to 80 inch pounds.

B. Cast Iron; Standard Weight; No-Hub Sleeve Gaskets:

1. Pipe: Standard weight no-hub cast iron soil pipe, bituminous corrosion protective coating inside and outside, CISPI 301 and CISPI Trademark.
2. Design Pressure: Gravity Maximum Design Temperature: 180°F
3. Joints: ASTM C1540, FM 1680, and ASTM C-564.
 - a. Super Duty, Shielded Stainless Steel Couplings: Neoprene sleeve gasket, 0.015" thick 304 stainless steel shield, stainless steel 3/8" screw type clamps, minimum of four clamps for 1-1/2" to 4" and six clamps for 5" and larger pipe sizes. Clamps shall be tightened to minimum 80 inch pounds or as manufacturer requires. Husky SD-4000 or equal.
4. Restraints: Install pipe and fittings per the Cast Iron Soil Pipe Institute's Designation 310. Restrain pipe and fittings using an engineered and tested product manufactured for restraining no-hub cast iron soil pipe. Install per manufacturer's recommendations.
5. Adapters: Transition from cast iron soil pipe to other pipe materials with manufactured adapters specifically for the application. Adapter must meet the same requirements as the joints listed above. ASTM C1460. Sticker identifying transition fitting application must be visible to view. For example, the most commonly used transition fitting from cast iron no-hub to PVC would be the Husky SD-4200 series.

2.2 COPPER PIPE

A. Copper Pipe; Type L; Solder Joints:

1. Pipe: Type L hard drawn seamless copper tube, ASTM B88.
2. Design Pressure: 175 psi; Maximum Design Temperature: 200°F.
3. Joints: Solder with 100% lead-free solder and flux, ASTM B32.
4. Fittings: Wrought copper solder joint, ANSI B16.22.

B. Copper Pipe; Type L; Mechanical Press Connection:

1. Pipe: Type L hard drawn seamless copper tube, ASTM B88.
2. Design Pressure: 175 psi; Maximum Design Temperature: 200°F.
3. Joints: Mechanical press connection.
4. Fittings: Copper, ANSI B-16.22, with embedded EPDM O-ring / sealing element engineered for this application, NSF-61.
5. Fitting Identification: Press ends shall provide the ability to identify an unpressed fitting from the floor prior to testing. The function of this feature is to provide the installer quick and easy identification of connections that have not been pressed prior to putting the system into operation.
6. Special Requirements: Mechanical press fitting manufacturer shall provide Contractor training prior to installation.
7. Manufacturers:
 - a. Viega ProPress
 - b. Apollo Press, a division of Aalberts - IPS
 - c. NIBCO Press System Fittings and Valves
 - d. Merit Brass

SECTION 22 10 00
PLUMBING PIPING

e. Mueller Streamline PRS

C. Copper Pipe; Type K; Solder Joints:

1. Pipe: Type K annealed copper tube, ASTM B88.
2. Design Pressure: 150 psi. Maximum Design Temperature: 200°F.
3. Joints: Solder with 100% lead-free solder and flux ASTM B32BCuP silver braze, AWS A5.8.
4. Fittings: Wrought copper solder joint, ANSI B16.22.
5. Corrosion Reducing Wrap: ASTM D-1248, Polyken #930, Northtown Polywrap-C, or equal alternative for copper pipe installed below grade.

D. Copper Pipe: Type DWV; Solder Joints:

1. Pipe: Type DWV hard temper seamless copper drainage tube, ASTM B306.
2. Design Pressure: Gravity Maximum Design Temperature: 180°F
3. Joints: Solder with 100% lead-free solder and flux, ASTM B32.
4. Fittings: Cast brass solder joint drainage type, ANSI B16.23 or wrought copper solder joint drainage type, ANSI B16.29.

2.3 PLASTIC PIPE

A. PVC-DWV; Schedule 40; Solvent Weld Joints:

1. Pipe: Schedule 40 rigid, PVC-DWV, cell classification 12454 for PVC per ASTM D1784, with plain ends, conforming to ASTM Standards D2665 or D2661. Cellular core piping is not acceptable.
2. Design Pressure/Temperature: Gravity at 140°F.
3. Joints: Solvent-weld socket type with solvent recommended by pipe manufacturer.
4. Fittings: PVC-DWV, cell classification 12454 for PVC per ASTM D1784, with solvent-weld socket type ends for Schedule 40 pipe.
5. Limits: Schedule 40 PVC-DWV pipe must not be threaded. Do not use where exposed or in return air plenums.
6. Use: Use PVC only where allowed by local jurisdiction. Comply with all special requirements or limitations.
7. Special Requirements: Provide expansion loop(s) and/or expansion joints in the piping system per the manufacturer's guidelines and as shown on the drawings.

2.4 VALVES

A. Shutoff Valves:

1. For pipe systems where mechanical press connections are allowed, shutoff valves with mechanical press connections are acceptable subject to the requirements in the paragraphs below.
2. Ball Valves:
 - a. BA-1: 3" and under, 150 psi saturated steam, 600 psi CWP, full port, threaded or solder ends (acceptable only if rated for soldering in line with 470°F melting point of lead-free solder), stainless steel ball and trim, Teflon seats and seals.
 - 1) Body: Lead free NSF-372, two-piece bronze of a copper alloy containing less than 15% zinc. Apollo Valves; a division of Aalberts-IPS #77CLF140/240 Series, Milwaukee #UPBA450S, Watts #LFB6080G2-SS, NIBCO #T-585-66-LF, Jomar T-200CSSG.

SECTION 22 10 00 PLUMBING PIPING

- 2) Body: Dezincification resistant brass alloy, lead free NSF-372. Jomar T-100CSSG.
 - 3) Provide solid extended shaft for all insulated piping. (For example, Apollo adds option -04 Stem Extension, NIBCO Nib-Seal Handle-NS, and Jomar modifies valve part number with -IH for insulated handle.)
 - 4) Provide lock out trim for all valves opening to atmosphere installed in domestic water piping over 120°F, heating water piping over 120°F, steam, condensate, boiler feed water piping, and gasoline/kerosene piping, and as indicated on the drawings. Solid extended shaft is not required on valves with lockout trim. (For example, Jomar and NIBCO modify valve part number with -LH for locking handle.)
- b. BA-1A: 2-1/2" and 3", 150 psi saturated steam, 275 psi CWP ANSI Class, 150 psi standard port, carbon steel body, stainless steel ball and trim, Teflon seats and seals. Apollo Valves, a division of Aalberts-IPS #88A-140, NIBCO #F510-CS/66, Milwaukee #F90.
- 1) Provide extended shaft for all valves in insulated piping.
 - 2) Provide lock out trim for all valves opening to atmosphere installed in domestic water piping over 120°F, heating water piping over 120°F, steam, condensate, boiler feed water piping, and gasoline/kerosene piping, and as indicated on the drawings. Solid extended shaft is not required on valves with lock out trim.
- c. BA-11: 2" and under, 300 psig water, standard port, screwed or compression. Bronze body and ball of a copper alloy containing less than 15% zinc, chrome plated, Teflon coated, or stainless steel ball. Teflon or Buna-N seats, lead free NSF-372. One piece "T" style cap and stem. A.Y. McDonald 6100 Series, Mueller 300 Series.
- d. BA-12: 2" and under, 300 psig water, standard port, screwed or compression. Bronze body and ball of a copper alloy containing less than 15% zinc, chrome plated, Teflon coated, or stainless steel ball. Teflon or Buna-N seats, lead free NSF-372. One piece "T" style cap and stem. Minneapolis Pattern threaded top. A.Y. McDonald 6100 Series, Mueller 300 Series.

2.5 STRAINERS

- A. For pipe systems where mechanical press connections are allowed, strainers with mechanical press connections are acceptable subject to the requirements in the paragraphs below.
- B. ST-1: Threaded Ends, 4" and under, lead free bronze or 304 stainless steel body, threaded connections, threaded removable cover, 0.045" 304 stainless steel perforated screen, 125 psi S @ 350°F, 200 psi CWP @ 150°F. Apollo Valves, a division of Aalberts-IPS YB-LF (59LF), Metraflex SSFT, Mueller / Watts LF351, Watts LF777, Jomar T-651G, Zurn SXL.

2.6 CHECK VALVES

- A. For pipe systems where mechanical press connections are allowed, check valves with mechanical press connections are acceptable subject to the requirements in the paragraphs below.
- B. CK-1: Threaded Ends, 2" and under, 125 psi steam @ 406°F, 200 psi CWP @ 150°F, threaded connection, lead free bronze body with brass or bronze disc, horizontal swing. Hammond #UP904, Milwaukee #UP509, NIBCO T-413-Y-LF, Jomar T-511G, Apollo Valves, a division of Aalberts-IPS #161T-LF.

SECTION 22 10 00
PLUMBING PIPING

2.7 LOCK OUT TRIM

- A. Provide lock out trim for all quarter turn shutoff valves opening to atmosphere and installed in domestic water piping over 120°F and as indicated on the drawings.

2.8 VALVE OPERATORS

- A. Provide handwheels for gate valves and gear operators for butterfly valves.

2.9 VALVE CONNECTIONS

- A. Provide all connections to match pipe joints. Valves shall be same size as pipe unless noted otherwise.

2.10 CONNECTIONS BETWEEN DISSIMILAR METALS

- A. Connections between dissimilar metals shall be insulating dielectric types that provide a water gap between the connected metals, and that either allow no metal path for electron transfer or that provide a wide water gap lined with a non-conductive material to impede electron transfer through the water path.
- B. Joints shall be rated for the temperature, pressure, and other characteristics of the service in which they are used, including testing procedure.
- C. Aluminum, iron, steel, brass, copper, bronze, galvanized steel and stainless steel are commonly used and require isolation from each other with the following exceptions:
 - 1. Iron and steel connected to each other.
 - 2. Brass, copper, and bronze connected to each other.
 - 3. Brass or bronze valves and specialties connected in closed systems with steel, iron, or stainless steel on both sides of the brass or bronze valves and specialties. Where two or more brass or bronze items occur together, they shall be connected with brass nipples. Brass or bronze valves and specialties cannot be used as a dielectric separation between pipe materials.
- D. Dielectric protection is required at connections to equipment of a material different than the piping.
- E. Screwed and/or Grooved Joints (acceptable up to 4" size):
 - 1. Dielectric waterway rated for 300 psi CWP and 225°F.
 - 2. Optional: Copper-silicon casting conforming to UNS C87850 with grooved and/or threaded ends.
 - 3. UL classified in accordance with ANSI / NSF-61 for potable water service.
 - 4. Manufacturers:
 - a. Elster Group ClearFlow fittings
 - b. Victaulic Series 647
 - c. Grinnell Series 407
 - d. Matco-Norca
- F. Flanged Joints (any size):
 - 1. Use 1/8" minimum thickness, non-conductive, full-face gaskets.
 - 2. Employ one-piece molded sleeve-washer combinations to break the electrical path through the bolts.

SECTION 22 10 00 PLUMBING PIPING

3. Sleeve-washers are required on one side only, with sleeves minimum 1/32" thick and washers minimum 1/8" thick.
4. Install steel washers on both sides of flanges to prevent damage to the sleeve-washer.
5. Separate sleeves and washers may be used only if the sleeves are manufactured to exact lengths and installed carefully so the sleeves must extend partially past each steel washer when tightened.
6. Manufacturers:
 - a. EPCO
 - b. Central Plastics
 - c. Pipeline Seal and Insulator
 - d. F. H. Maloney
 - e. Calpico

PART 3 - EXECUTION

3.1 PREPARATION

- A. Install all products per manufacturer's recommendations.
- B. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- C. Remove scale and dirt, on inside and outside, before assembly.
- D. Remove all scale, rust, dirt, oils, stickers and thoroughly clean exterior of all bare metal exposed piping, hangers, and accessories in preparation to be painted.
- E. Connect to equipment with flanges or unions. Unions or flanges for servicing and disconnect are not required in installations using grooved joint couplings.
- F. Use only piping materials rated for the maximum temperature of the application, e.g., do not use PVC for dishwasher drainage or piping that receives boiler blowdown.
- G. Roof Penetration (Vent) Flashing:
 1. Built-up Roofing: Flash vents with 3# seamless sheet lead of sufficient size to extend 15" into roofing felts for built-up roofs.
 2. Membrane, Metal or Shingled Roofs: Flash vents with premolded pipe flashing cones for single-ply membrane roofs, metal roofs, or shingled roofs.
- H. Existing building sewers or building drains which are shown on the documents to be reused shall be inspected and recorded by closed circuit television for their condition. Report findings back to the Architect, Engineer, and Owner before proceeding with work so any necessary rework can take place if needed.

3.2 SYSTEM, PIPING AND VALVE SCHEDULE

- A. Cold Water, Hot Water, Tempered Water, Reclaimed Water - Potable and Non-Potable (Above Ground):
 1. Copper Pipe; Type L; Solder Joints: All Sizes
 2. Copper Pipe; Type L; Mechanical Press Connection: 4" and Under
 3. Shutoff Valves: BA-1
 4. Check Valves: CK-1, CK-2, CK-3

SECTION 22 10 00
PLUMBING PIPING

- B. Strainers: ST-1, ST-2 Cold Water, Hot Water, Tempered Water, Reclaimed Water - Potable and Non-Potable (Underground):
 - 1. Copper Pipe; Type K; Solder Joints: All Sizes
- C. Shutoff Valves: BA-1, BA-1A Sanitary Waste and Vent, Gravity (Above Ground):
 - 1. Cast Iron; Standard Weight; Hub and Spigot Joints: All Sizes
 - 2. Cast Iron; Standard Weight; No-Hub Sleeve Gaskets: 1-1/2" to 15" Copper Pipe: Type DWV; Solder Joints: 1-1/4" to 4"
- D. Sanitary Indirect Drainage (Above Ground):
 - 1. Cast Iron; Standard Weight; Hub and Spigot Joints: All Sizes
 - 2. Cast Iron; Standard Weight; No-Hub Sleeve Gaskets: 1-1/2" to 15" Copper Pipe: Type DWV; Solder Joints: 1-1/4" to 4"
- E. Sanitary Waste and Vent, Gravity (Underground):
 - 1. Cast Iron; Standard Weight; Hub and Spigot Joints: All Sizes
 - 2. Cast Iron; Standard Weight; No-Hub Sleeve Gaskets: 1-1/2" to 15"
 - 3. PVC-DWV or ABS-DWV; Schedule 40; Solvent Weld Joints: All Sizes

3.3 TESTING PIPING

- A. Sanitary Drainage, Sanitary Vent:
 - 1. Test all piping with water to prove tight.
 - 2. Test piping before insulation is applied.
 - 3. Hydrostatically test all soil, waste, and vent piping inside of building with 10 feet head of water for 15 minutes. Inspect before fixtures are connected. If leaks appear, repair them and repeat the test.
 - 4. Hydrostatically test interior downspouts with 10 feet head of water for 15 minutes with no leaks.
 - 5. A smoke/air test at the same pressure may be used in lieu of the hydrostatic water test. Exception: Smoke/air test shall not be performed on plastic piping.
 - 6. Test force mains with water at 105% of the operating pump discharge pressure for 15 minutes.
 - 7. Test pressures stated above shall be as listed or as required by the Authority Having Jurisdiction, whichever is most stringent.
- B. Hot Water - Potable and Non-Potable, Cold Water - Potable and Non-Potable, Tempered Water - Potable and Non-Potable:
 - 1. Test pipes underground or in chases and walls before piping is concealed.
 - 2. Test all pipes before the insulation is applied. If insulation is applied before the pipe is tested and a leak develops which ruins the insulation, replace damaged insulation.
 - 3. Test the pipe with 100 psig water pressure or equal inert gas such as nitrogen. Exception: Inert gas test shall not be used to test plastic piping.
 - 4. Hold test pressure for at least 2 hours.
 - 5. Test to be witnessed by the Architect/Engineer's representative, if requested by the Architect/Engineer.
- C. All Other Piping:
 - 1. Test piping at 150% of normal operating pressure.

SECTION 22 10 00 PLUMBING PIPING

2. Piping shall hold this pressure for one hour with no drop in pressure.
3. Test piping using water, nitrogen, or air as compatible with the final service of the pipe. Do not use combustible fluids.
4. Drain and clean all piping after testing is complete.

3.4 CLEANING PIPING

A. All Water Piping:

1. Flush all piping using faucets, flush valves, etc. until the flow is clean.
2. After flushing, thoroughly clean all inlet strainers, aerators, and other such devices.
3. If necessary, remove valves to clean out all foreign material.

3.5 INSTALLATION

A. General Installation Requirements:

1. Provide dielectric connections between dissimilar metals.
2. Route piping in orderly manner and maintain gradient. Install to conserve building space.
3. Group piping whenever practical at common elevations.
4. Install piping to allow for expansion and contraction without stressing pipe, joints, or equipment.
5. Slope water piping and arrange to drain at low points.
6. Install bell and spigot piping with bells upstream.
7. Where pipe supports are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.
8. Seal pipes passing through exterior walls with a wall seal per Section 22 05 29. Provide Schedule 40 galvanized sleeve at least 2 pipe sizes larger than the pipe.
9. All non-potable outlets shall be clearly marked with a permanently affixed laminated sign with 3/8" high lettering saying "Non-Potable Water Not for Human Consumption." Sign shall have black lettering on a yellow background.
10. All vertical pipe drops to sinks or other equipment installed below the ceiling shall be routed within a wall cavity, unless specifically noted otherwise to be surface mounted. For renovation projects, this Contractor is responsible for opening and patching existing walls for installation of piping. Wall patching shall match existing condition.

B. Installation Requirements in Electrical Rooms:

1. Do not install piping or other equipment above electrical switchboards or panelboards. This includes a dedicated space extending 25 feet from the floor to the structural ceiling with width and depth equal to the equipment.

C. Valves/Fittings and Accessories:

1. Install shutoff valves that permit the isolation of equipment/fixtures in each room without isolating any other room or portion of the building. Individual fixture angle stops do not meet this requirement. Exception: Back-to-back rooms in no more than two adjacent rooms.
2. Provide clearance for installation of insulation and access to valves and fittings.
3. Provide access doors for concealed valves and fittings.
4. Install valve stems upright or horizontal, not inverted.
5. Provide one plug valve wrench for every ten plug valves 2" and smaller, minimum of one. Provide each plug valve 2-1/2" and larger with a wrench with set screw.
6. Install corrugated, stainless steel tubing system according to manufacturer's written instructions. Include striker plates to protect tubing from puncture where tubing is restrained and cannot move.

SECTION 22 10 00
PLUMBING PIPING

D. Underground Piping:

1. Install buried water piping outside the building with at least 5 feet of cover. Refer to Section 22 05 00 for Excavation, Fill, Backfill and Compaction requirements
2. Install thrust blocking and restraints on all underground fire protection service piping per NFPA 24 and as shown on drawings.
3. Install underground, sleeved, corrugated, stainless steel tubing system according to manufacturer's written instructions. Extend vent from sleeve to exterior of building and terminate with screened elbow.
4. Direct buried, uninsulated steel pipe shall have a factory applied external protective coating consisting of two coats with an intermediate layer of 18 mil fibrous glass mat. Coating thickness shall total not less than 3/32". The outer coating shall be further protected by a wrapping of heavy Kraft paper. This external protection shall extend and be exposed for a minimum of 1 foot beyond the buried or concealed portion of the pipe.

a. Manufacturers:

- 1) Pipe Line Service Co., Franklin Park, Illinois
- 2) Lithcote Corp., Melrose Park, Illinois

5. As an option, the Contractor may provide factory applied protective coatings consisting of a polyethylene plastic film bonded to the pipe surface by a hot applied thermo-plastic adhesive.

a. Manufacturers:

- 1) Republic Steel Corp. "X-Tru-Coat"

6. Exercise care in handling, storing and laying pipe to avoid damaging factory applied coatings. If any damage occurs, repair the coating to a condition equal to the original.
7. Field application of protective coatings to joints, fittings and to any damaged factory applied coatings shall be similar to factory applied coatings specified above and shall be done in strict accordance with recommendations of the supplier of pipe coatings.
8. After completion of the fabrication, laying and field coating of the joints and fittings, but prior to backfilling, inspect the entire line in the presence of the Architect/Engineer's representative with an electronic holiday detector. Any defects in the protective coatings shall be repaired in accordance with requirements for original coatings.
9. Coat flange bolts and nuts in pits and below ground at the time of installation with a corrosion protective coating.

E. Sanitary and Storm Piping:

1. Install all sanitary and storm piping inside the building with a slope as shown on the drawings.
2. Install horizontal offset at all connections to roof drains to allow for pipe expansion.
3. Slope sanitary and storm piping outside the building to meet invert elevations shown on drawings and to maintain a minimum velocity of 2 feet per second.
4. Sway Bracing: Where horizontal sanitary and/or storm pipes 4 inches and larger change flow direction greater than 45°, rigid bracing or thrust restraints shall be installed to resist movement of the upstream pipe in the direction of pipe flow. The rigid bracing or thrust restraint shall be connected to structure. A change of flow direction from horizontal into a vertical pipe does not require the upstream pipe to be braced.
5. All sanitary and storm piping shall have at least 42" of cover when leaving the building.
6. Starter fittings with internal baffles are not permitted.

SECTION 22 10 00 PLUMBING PIPING

3.6 PIPE ERECTION AND LAYING

- A. Carefully inspect all pipe, fittings, valves, equipment and accessories before installation. Any items that are unsuitable, cracked or otherwise defective shall be removed from the job immediately.
- B. All pipe, fittings, valves, equipment and accessories shall have factory applied markings, stampings, or nameplates with sufficient data to determine their conformance with specified requirements.
- C. Exercise care at every stage of storage, handling, laying and erecting to prevent entry of foreign matter into piping, fittings, valves, equipment and accessories. Do not install any item that is not clean.
- D. Until system is fully operational, all openings in piping and equipment shall be kept closed except when actual work is being performed on that item or system. Closures shall be plugs, caps, blind flanges or other items specifically designed and intended for this purpose.
- E. Run pipes straight and true, parallel to building lines with minimum use of offsets and couplings. Provide only offsets required to provide needed headroom or clearance and to provide needed flexibility in pipe lines.
- F. Make changes in direction of pipes only with fittings or pipe bends. Changes in size only with fittings. Do not use miter fittings, face or flush bushings, or street elbows. All fittings shall be of the long radius type, unless otherwise shown on the drawings or specified.
- G. Provide flanges or unions at all final connections to equipment, traps and valves.
- H. Arrange piping and connections so equipment served may be totally removed without disturbing piping beyond final connections and associated shutoff valves.
- I. Use full and double lengths of pipe wherever possible.
- J. Unless otherwise indicated, install all piping, including shutoff valves and strainers, to coils, pumps and other equipment at line size with reduction in size being made only at control valve or equipment.
- K. Cut all pipe to exact measurement and install without springing or forcing except in the case of expansion loops where cold springing is indicated on the drawings.
- L. Underground pipe shall be laid in dry trenches maintained free of accumulated water. Refer to Section 22 05 00 for Excavation, Fill, Backfill and Compaction requirements.
- M. Unless otherwise indicated, branch take-offs shall be from top of mains or headers at either a 45° or 90° angle from the horizontal plane for air lines, and from top, bottom or side for liquids.
- N. Do not use geotextile fabric with footing tile if silt content of soil exceeds 40% or if clay content exceeds 50%. The fabric shall be installed around 1" river rock or 2" limestone.

3.7 DRAINING AND VENTING

- A. Unless otherwise indicated on the drawings, all horizontal water lines, including branches, shall pitch 1" in 40 feet to low points for complete drainage, removal of condensate and venting.
- B. Maintain accurate grade where pipes pitch or slope for venting and drainage. No pipes shall have pockets due to changes in elevation.

SECTION 22 10 00 PLUMBING PIPING

- C. Provide drain valves at all low points of water piping systems for complete or sectionalized draining.
- D. Use eccentric reducing fittings on horizontal runs when changing size of pipes for proper drainage and venting. Install gravity drain pipes with bottom of pipe and eccentric reducers in a continuous line; all other liquid lines with top of pipe and eccentric reducers in a continuous line.
- E. Provide air vents at high points and wherever else required to eliminate air in all water piping systems.
- F. Install air vents in accessible locations. If necessary to trap and vent air in a remote location, install an 1/8" pipe from the tapping location to an accessible location and terminate with a venting device.
- G. All vent and drain piping shall be of same materials and construction for the service involved.

3.8 PLUMBING VENTS

- A. Vent as shown on the drawings and in accordance with all codes having jurisdiction.
- B. Extend the high side of the soil and waste stacks at least 12" above roof.
- C. Flash pipes at the roof with 3# lead sheet. Extend flashing under roofing 15" in all directions from pipe to be flashed. Extend a lead collar up on the outside of pipe to be flashed and extend 1" beyond the top of the pipe. The 1" excess length of collar shall be turned down into the top of the pipe where it shall fit tight to the inside of the pipe.
- D. Flash pipes at roof with premolded EPDM pipe flashing cones adhered to roof membrane by General Contractor. Secure top of cone with stainless steel clamp and seal watertight.
- E. Increase vent pipes through the roof two pipe sizes with long increasers located at least 12" below the roof.
- F. In no case shall the vent through the roof be less than 4" in diameter.
- G. Vent pipes through the roof shall be located a minimum of 6" from any air intake opening on the roof.

3.9 BRANCH CONNECTIONS

- A. For domestic water and vent systems only, make branch connections with standard tee or cross fittings of the type required for the service.
- B. Reducers are generally not shown. Where pipe sizes change at tee, the tee shall be the size of the largest pipe shown connecting to it.
- C. Do not use double wye or double combination wye and eighth bend DWV fittings in horizontal piping.
- D. Branch connections from the headers and mains may be mechanically formed using an extraction device. The branch piping connection shall be brazed connection for the following services only:
 - 1. Domestic water piping above ground.

SECTION 22 10 00
PLUMBING PIPING

E. Further limit use of mechanically formed fittings as follows:

1. Must have at least same pressure rating as the main.
2. Main must be Type K or L copper tubing.
3. Permanent marking shall indicate insertion depth and orientation.
4. Branch pipe shall conform to the inner curve of the piping main.
5. Main must be 1" or larger.
6. Branch must be 3/4" or larger.

3.10 JOINING OF PIPE

A. Solder Joints (Copper Pipe):

1. Make up joints with 100% lead-free solder, ASTM B32. Cut tubing so ends are perfectly square and remove all burrs inside and outside. Thoroughly clean sockets of fittings and ends of tubing to remove all oxide, dirt and grease just prior to soldering. Apply flux evenly, but sparingly, over all surfaces to be joined. Heat joints uniformly so solder will flow to all mated surfaces. Wipe excess solder, leaving a uniform fillet around cup of fitting.
2. Flux shall be non-acid type.
3. Solder end valves may be installed directly in the piping system if the entire valve is suitable for use with 470°F melting point solder. Remove discs and seals during soldering if they are not suitable for 470°F.

B. Mechanical Press Connection (Copper):

1. Copper press fitting shall be made in accordance with the manufacturer's installation instructions.
2. Fully insert tubing into the fitting and mark tubing.
3. Prior to making connection, the fitting alignment shall be checked against the mark made on the tube to ensure the tubing is fully engaged in the fitting.
4. Joint shall be pressed with a tool approved by the manufacturer.
5. Installers shall be trained by manufacturer personnel or representative. Provide documentation upon request.

C. Hub and Spigot Joints - Sanitary Pipe and Storm Pipe (Cast Iron):

1. Compression Gasket Joints: Joint shall be one-piece double seal compression type gasket made specifically for joining cast iron soil pipe. Gasket shall be neoprene, permitting joint to flex as much as 5 degrees without loss of seal. Gasket shall be extra heavy weight class, conforming to ASTM C-564.

D. Solvent Weld Joints (PVC):

1. Make joints with a two-step process. Use primer conforming to ASTM F656 and solvent cement conforming to ASTM D2564.
2. All contractor personnel that will prepare solvent cemented joints shall be qualified for such bonding practices according to the bonding qualifications procedures described in ASME B31.3, Chapter VII for bonding of plastic piping.

E. No-Hub Sleeve Gaskets (No-Hub) (Cast Iron Pipe):

1. Gasket shall be heavy weight class, conforming to ASTM C564.
2. The gasket shall have an internal center stop.
3. The gasket shall be covered by a stainless steel band secured with a minimum of four stainless steel bands per fitting/joint.

SECTION 22 10 00
PLUMBING PIPING

- 4. Sleeve gaskets shall be installed in accordance with the manufacturer's installation instructions.
 - F. Couplings: Assemblies with combinations of clamps, gaskets, sleeves, and threaded or flanged parts; compatible with piping and system liquid; and made by piping manufacturer for joining system piping.
 - G. Adapters and Transition Fittings: Assemblies with combinations of clamps, couplings, adapters, gaskets, and threaded or flanged parts; compatible with piping and system liquid; and made for joining different piping materials.
 - H. Flanges: Assemblies of companion flanges and gaskets complying with ASME B16.21 and compatible with system liquid, and bolts and nuts.
- 3.11 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM
- A. Disinfection of the domestic water piping shall be completed within three (3) weeks prior to building occupancy. Contractor is responsible for disinfecting water piping if used by workers during construction; disinfection during construction does not eliminate the requirement for final disinfection prior to occupancy. Flushing of piping shall be completed within two (2) weeks prior to building occupancy.
 - B. Provide necessary connections at the start of individual sections of mains for adding chlorine.
 - C. Before starting work, verify system is complete, flushed and clean.
 - D. Follow the disinfection of potable water procedure outlined in this project's applicable plumbing code. For example: IPC 610.1, UPC 609.10, CPC 609.9, and Illinois 890.1180. Where local codes do not outline a disinfection procedure, follow the International Plumbing Code procedure 610.1.
 - E. Bleed water from all outlets to ensure chlorine distribution throughout the entire domestic water system.
 - F. Take water samples, no sooner than 24 hours after flushing, from 2% of outlets and from water entry. Obtain, analyze, and test samples in accordance with AWWA C651, Section 5 - Verification.

END OF SECTION 221000

SECTION 22 10 30
PLUMBING SPECIALTIES

SECTION 22 10 30 - PLUMBING SPECIALTIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Cleanouts.
- B. Traps.
- C. Trap Seals.
- D. Floor Drains and Sinks
- E. Strainers.
- F. Unions.
- G. Balancing Valves.
- H. Water Hammer Arresters.
- I. Air Vents.
- J. Drain Valves.
- K. Relief Valves.

1.2 QUALITY ASSURANCE

- A. Manufacturer: For each product specified, provide components by same manufacturer throughout.
- B. Piping, Fittings, Valves, and Flux for Potable Water Systems: All components shall be lead free per Federal Act S.3874, Reduction of Lead in Drinking Water Act.

1.3 SUBMITTALS

- A. Submit shop drawings under provisions of Section 22 05 00.
- B. Include sizes, rough-in requirements, service sizes, and finishes.

PART 2 - PRODUCTS

2.1 CLEANOUTS

- A. Provide cleanouts as shown and specified on the drawings as well as required by code.
- B. Coordinate floor cleanout cover with surrounding floor finish. Provide either solid, recessed for tile or terrazzo or carpet marker as applicable.
- C. Cleanouts on exposed pipes shall be cast iron with heavy duty cast brass plug with raised head.

SECTION 22 10 30
PLUMBING SPECIALTIES

- D. Cleanout shall be same size as the pipe up to 6" and 6" for larger pipes.

2.2 TRAPS

- A. Provide all individual connections to the sanitary system with P-traps, except where such drains discharge directly into a properly trapped collection basin or sump. Unless otherwise specified or shown, traps shall be:
1. Chromium plated cast brass when used with plumbing fixtures or when installed exposed in finished spaces.
 2. Insulated at accessible lavatories.
 3. Cast iron, deep-seal pattern where concealed above ceiling, below grade or in unfinished areas.
 4. Deep-seal pattern of the same material and/or coating where drainage lines are of special materials or coatings such as polypropylene, PVDF, CPVC, etc.
- B. All traps shall have accessible, removable cleanouts, except where installed on floor drains with removable strainers.
- C. Each trap shall be completely filled with water at the end of construction but before building turnover to the Owner. All floor drains, floor sinks, trench drains, etc. shall be filled with water.

2.3 TRAP SEALS AND PRIMERS

- A. Provide trap seals as specified on the drawings.
- B. Provide trap primers as shown and specified on the drawings.
- C. Where trap primers are shown on drawings, coordinate with corresponding floor drains to ensure they include a side inlet connection for the trap primer line.

2.4 FLOOR DRAINS

- A. Floor drains shall be in the form of a receptor with grate/strainer set flush with the surrounding floor.
- B. Provide floor drains and sinks as shown and specified on the drawings as well as required by code.

2.5 STRAINERS

- A. Unless otherwise indicated, strainers shall be Y-pattern and have stainless steel screens with perforations as follows:
1. Water:
 - a. 1/4" - 2": 3/64" perforations
 - b. 2-1/2" - 10": 1/16" perforations
 - c. 12" - 18": 1/8" perforations
- B. Furnish pipe nipple with shutoff valve to blow down all strainer screens.
- C. Use bronze body strainers in copper piping and iron body strainers in ferrous piping.

SECTION 22 10 30
PLUMBING SPECIALTIES

2.6 UNIONS

- A. Copper pipe - wrought copper fitting - ground joint.
- B. Black Steel (Schedule 40) Pipe - malleable iron, ground joint, 150 psi, bronze to bronze seat.
- C. Galvanized Steel Pipe - galvanized malleable iron, ground joint, 150 psi, bronze to bronze seat.

2.7 BALANCING VALVE

- A. Rated for 125 psi working pressure and 250°F operating temperature, taps for determining flow with a portable meter, positive shutoff valves for each meter connection, memory feature, tight shutoff, and a permanent pressure drop between 1' and 2' water column at full flow with valve 100% open. Furnish with molded, removable insulation covers.
- B. Provide a nomograph to determine flow from meter reading (and valve position on units which sense pressure across a valve). Graph shall extend below the specified minimum flow.
- C. Flow rate of 0.5 GPM or larger: Valves in copper piping shall be brass or bronze. Acceptable Manufacturers: Flow Design "Accusetter", Preso "B+", Armstrong "CVB", Bell & Gossett "Circuit Setter Plus", Griswold "Quickset", Gerand "Balvalve Venturi" or Nibco Globe Style balancing valve.
- D. Flow rate less than 0.5 GPM: Valves in copper piping shall be brass or bronze. Cv value shall be less than 1.0 when valve is completely open, and minimum balanceable flow rate shall not exceed 0.1 GPM with a meter reading of at least 2.5 feet. Acceptable manufacturers: Bell & Gossett "Circuit Setter RF", Flow Design, Preso, Armstrong, Griswold, Gerand, or Nibco balancing valve.
- E. Manufacturer shall size balancing valves for the scheduled flow rate. Flow rate shall be measurable on manufacturer's standard meters.

2.8 BALANCING VALVE WITH FLOW INDICATION

- A. Balancing valve with built-in visual flow meter, adjustable flow control with memory stop feature, external temperature gauge, and tight shutoff.
- B. Maximum working pressure: 150 psi. Maximum Temperature 230°F. Maximum differential pressure: 15 psi. Maximum inlet temperature: 195°F.
- C. Low-lead brass valve, stainless steel springs, EPDM seals.
- D. Manufacturer shall size balancing valves for the scheduled flow rate. Flow rate shall be measurable on the self-contained visual flow meter.
- E. Acceptable Manufacturers:
 - 1. Calieffi 132 Series
 - 2. Watts CSD (provide with separate external temperature gauge)

2.9 WATER HAMMER ARRESTERS

- A. Provide water hammer arresters as shown and specified on the drawings as well as required by code.

SECTION 22 10 30
PLUMBING SPECIALTIES

- B. ANSI A112.26.1; sized and located in accordance with PDI WH-201, precharged for operation between -100°F and 300°F and maximum 250 psig working pressure.

2.10 AIR VENTS

- A. Provide means for venting air at all high points in the piping system and at all other points where air may be trapped.
- B. At end of main and other points where large volume of air may be trapped - Use 1/4" globe valve, angle type, 125 psi, Crane #89, attached to coupling in top of main, 1/4" discharge pipe turned down with cap.

2.11 DRAIN VALVES

- A. Drain valves shall be shutoff valves as specified for the intended service with added 3/4" male hose thread outlet and cap.

PART 3 - EXECUTION

3.1 INSTALLATION AND APPLICATION

- A. Coordinate construction to receive drains at required invert elevations.
- B. Install all items per manufacturer's instructions.
- C. Water Hammer Arresters:
 - 1. Install water hammer arresters in accessible locations. Provide access doors as required. Coordinate type with Architect/Engineer/Owner.
 - 2. Water hammer arrestors shall be installed in cold and hot water lines upstream of all plumbing fixtures or equipment, with a quick acting valve or multiple quick acting valves. Quick acting valves shall be defined as solenoid actuated valves, manual flush valves, sensor activated faucets and flush valves, squeeze handle spray faucets, and other similar type valves.
 - 3. Install multiple water hammer arrestors in toilet group branch piping greater than 20 feet in developed length from the cold and hot water mains.
- D. Cleanouts:
 - 1. Provide cleanouts where shown on the drawings and as required by code, but in no case farther apart than 50 feet in pipe less than 6" size and 100 feet apart in 6" and larger pipes inside the building. Provide cleanouts at bases of all sanitary and storm risers as shown on the drawings and as required by code.
 - 2. Provide a cleanout at the upstream end of a horizontal waste pipe in a plumbing chase serving multiple plumbing fixtures; for example a bank of water closets or lavatories.
 - 3. Provide cleanouts on the branch line connected to individual plumbing fixtures as required by code; for example just below a sink, lavatory or urinal.
 - 4. Extend underfloor cleanouts up to the floor with long sweep elbows.
 - 5. Install a full size, two-way cleanout within 5 feet of the foundation inside or outside of building.
 - 6. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with graphite and linseed oil. Ensure clearance at cleanouts for rodding of drainage system.
 - 7. Wall cleanouts shall be installed above the flow line of the pipe they serve, but no less than 12" above the finished floor.

SECTION 22 10 30
PLUMBING SPECIALTIES

E. Floor Drains and Floor Sinks:

1. Drains in upper floors shall have a flashing of EPDM or similar membrane sheet. The sheet shall be at least 36" X 36" square with the drain in the center. Clamp membrane in auxiliary clamping ring of floor drain. Membrane is not required if upper floor construction is single pour, cast-in-place concrete.
2. Use alternate sealing method when installing drains in existing floor slabs.
3. Coordinate sloping requirements with the architectural plans and specifications.
4. Top of floor drain and sinks grate/strainer shall not extend above the finished floor elevation.
5. Top of floor drain and sink grate/strainer shall not extend above the finished floor elevation. Grate/strainer shall be installed flush with surrounding finished floor. Should the Plumbing Contractor believe this presents a conflict with code, the issue should be evaluated before installation of the floor drain or sink begins. Proceeding with installing a floor drain or sink raised above the finished floor without prior approval will result in the Contractor being required to remove the drain or sink in question and reinstall it at the approved elevation.

F. Balancing Valves:

1. Install balancing valves with straight, unobstructed pipe section both upstream and downstream as required, per manufacturer's installation instructions.

END OF SECTION 221030

SECTION 22 40 00
PLUMBING FIXTURES

SECTION 22 40 00 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. All plumbing fixtures.

1.2 SUBMITTALS

- A. Submit product data under provisions of Section 22 05 00. Submittals shall include fixture carriers for record purposes only. Architect/Engineer does not review or approve carriers except for manufacturer.
- B. Include fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
- C. For fixtures and trim requiring electrical connections, submit product data indicating general assembly, components, electrical power/controls wiring diagrams, and service connections.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All fixtures shall be as shown on the drawings and as scheduled in the plumbing material list. Additional requirements below:
- B. All vitreous china fixtures shall be from the same manufacturer where possible.
- C. All lavatory and sink trim shall be from the same manufacturer where possible.
- D. All fixtures shall be lead free. Faucets, traps, stops, and other fixture accessories shall not contain more lead than allowed per the latest State or Federal Act.
- E. P-Traps and Tailpieces:
 - 1. Lavatories:
 - a. Accessible Type: 1-1/4" chrome plated 17-gauge cast brass offset tailpiece and p-trap with cleanout on bottom of trap.
 - b. Non-Accessible Type: Offset not required for tailpiece, otherwise same.
 - 2. Sinks:
 - a. Accessible Type: 1-1/2" chrome plated 17-gauge cast brass offset tailpiece and p-trap with cleanout on bottom of trap.
 - b. Non-Accessible Type: Offset not required for tailpiece, otherwise same.
 - 3. Acceptable Manufacturers:
 - a. McGuire
 - b. Keeney
 - c. Dearborn Brass
 - d. Zurn

SECTION 22 40 00
PLUMBING FIXTURES

- e. Chicago Faucet
- F. Insulation Covers and Enclosures for Accessible Lavatories and Sinks:
- 1. Premanufactured cover for P-trap, stop valves, and supply lines.
 - a. 1/8" thick vinyl construction, paintable, tool free installation,
 - b. Acceptable Manufacturers:
 - 1) Truebro (Lav Guard 2)
 - 2) Plumberex (Pro-Extreme)
 - 3) McGuire (Prowrap)
 - 4) Buckaroos Inc.
 - 5) Zurn
 - 2. Premanufactured rigid enclosure for concealing lavatory P-trap, stop valves, and supply lines,
 - a. Rigid, high impact PVC, paintable, stainless steel fasteners for anchoring and removal.
 - b. Acceptable Manufacturers:
 - 1) Truebro (Lav Shield #2018)
 - 2) Zurn (Z6900-VG)
 - 3) Approved equal
 - 3. Premanufactured rigid enclosure for concealing sink P-trap, stop valves, supply lines, garbage disposal, etc.
 - a. Rigid, high impact PVC, white or beige (Color by architect), paintable, 36" or 42" widths, stainless steel fasteners for anchoring and removal.
 - b. Acceptable Manufacturers:
 - 1) Truebro (Basin Guard)
 - 2) Approved equal
- G. Angle Stops and Supplies:
- 1. Lavatories, Sinks and Tank Type Water Closets:
 - a. Lead-free, 3/8" chrome plated brass, quarter turn ball valve type with loose key stops, solder or compression connection type.
 - b. Lead-free, 3/8" chrome plated soft copper risers or stainless steel braided reinforced PVC hose.
 - c. Acceptable Manufacturers:
 - 1) McGuire
 - 2) BrassCraft
 - 3) Keeney
 - 4) Zurn
 - 5) Chicago Faucet
- H. Wall Hung Fixture Carriers:
- 1. Material: All Metal, ASME/ANSI A112.6.1M.
 - 2. Lavatory carrier shall be rated to support 250 lbs unless noted otherwise on the drawings.

SECTION 22 40 00
PLUMBING FIXTURES

3. Water closet carrier shall be rated to support 500 lbs unless noted otherwise on the drawings
4. Manufacturers:
 - a. Zurn
 - b. JR Smith
 - c. Wade
 - d. Josam
 - e. Watts
 - f. Mifab
 - g. Sun Drainage Products
 - h. Sioux Chief

PART 3 - EXECUTION

3.1 INSTALLATION

A. General Installation Requirements:

1. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.
2. Install each fixture with trap easily removable for servicing and cleaning. Use screwed tailpiece couplings. Connect fixture waste to stack with slip fitting.
3. Provide fixtures with supply lines, stop valves, reducers, escutcheons, and any other items required for a complete and operational plumbing fixture assembly.
4. Install components level and plumb.
5. Caulk joint between finish floor and floor mounted fixtures and between finish walls and wall mounted fixtures with silicon caulk. Caulk the joint, between rim and fixture where a fixture builds into a counter top, with caulking compound. Refer to DIVISION 7 for "Caulking" requirements. Color to match fixture.
6. Where there is a possibility of water following pipe brackets, etc., into a wall; caulk escutcheons, space around brackets, etc., to exclude water. Refer to DIVISION 7 for "Caulking" requirements.
7. Refer to Plumbing Material List for fixture mounting heights.
8. All non-potable outlets shall be clearly marked with a permanently affixed laminated sign with 3/8" high lettering saying "Non-Potable Water Not for Human Consumption." Sign shall have black lettering on a yellow background.

B. Wall-Mounted Fixture Requirements:

1. All wall-mounted fixtures shall have compatible carriers designed for their intended service and suitable for the space available and configuration of fixtures. All carriers shall extend to the floor and be anchored to the slab as intended by the carrier manufacturer.

C. Floor-Mounted Fixture Requirements:

1. Where floor mounted fixtures are installed on a sloped floor, the open void below the fixture shall be grouted, leveled, and caulked to eliminate stress on the fixture and to prevent water migration to the floor below.

D. Exposed or Inside Accessible Cabinets Traps, Valve and Pipe Requirements:

1. All water or waste piping for plumbing fixtures that is exposed or inside cabinets shall be chrome plated.
2. All exposed flush valves for water closets and urinals shall have a chrome plated hanger to anchor the piping to the wall.

SECTION 22 40 00
PLUMBING FIXTURES

3. All exposed water supply piping and fittings in a finished space to a shower valve, hose bibb, or other water outlet shall be chrome plated.

E. ADA Accessible Exposed Sink and Lavatory Trim:

1. All exposed sink and lavatory traps, piping and angle stops installed at accessible sink and lavatory locations shall include offset style drain tailpiece, p-trap installed near and parallel with back wall, and insulation kit specially manufactured for this installation. Armaflex with duct tape is not acceptable.

F. ADA Accessible Water Closet Requirements:

1. Handicapped accessible water closet flush valve or flush tank handles shall be on the left hand or right hand side of the fixture, whichever is nearer to the center of the stall.
2. Coordinate flush valves in handicap accessible locations with grab bars installed by the General Contractor. Make modifications as necessary to flush valve piping to avoid conflict with grab bars. Common solutions include shortened or offset vacuum breaker tailpieces.

G. Bathtubs and Shower Requirements:

1. All acrylic and fiberglass bathtubs and showers shall have a non-shrink grout or manufacturer-approved material installed between the finished floor and floor of the fixture to prevent damage caused by deflection.
2. All rough-in pockets for showers and tubs located in basement floor installations shall be filled in with concrete and sealed tight.

3.2 ADJUSTING AND CLEANING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.
- B. At completion, clean plumbing fixtures, equipment, and faucet aerator screens.

3.3 FIXTURE ROUGH-IN SCHEDULE

- A. Rough-in fixture piping connections in accordance with table on plumbing drawings of minimum sizes for particular fixtures.

END OF SECTION 224000

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

SECTION 23 05 00 - BASIC HVAC REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Requirements applicable to all Division 23 Sections. Also refer to Division 01 - General Requirements.
- B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 SCOPE OF WORK

- A. This Specification and the associated drawings govern the furnishing, installing, testing and placing into satisfactory operation the Mechanical Systems.
- B. Each Contractor shall provide all new materials indicated on the drawings and/or in these specifications, and all items required to make the portion of the Mechanical Work a finished and working system.
- C. All work will be awarded under a single General Contract. The division of work listed below is for the Contractor's convenience and lists normal breakdown of the work.
- D. Scope of Work:
 - 1. Plumbing Work: Refer to Section 22 05 00 "Basic Plumbing Requirements".
 - 2. Heating Work shall include, but is not necessarily limited to:
 - a. Extend existing steam distribution system including piping, insulation, terminal heating equipment, traps, and specialties. Make final connections to all coils, including those furnished by others.
 - b. Furnish and install firestopping systems for penetrations of fire-rated construction associated with this Contractor's work.
 - 3. Air Conditioning and Ventilating Work shall include, but is not necessarily limited to:
 - a. Furnish and install complete exhaust ductwork systems including all fittings, insulation, inlets, and fans.
 - b. Furnish and install all temperature control systems.
 - c. Furnish and install firestopping systems for penetrations of fire-rated construction associated with this Contractor's work.
 - d. Complete all applicable tests, certifications, forms, and matrices.
 - 4. Testing, Adjusting, and Balancing Work shall include, but is not necessarily limited to:
 - a. Furnish complete testing, adjusting, and balancing as specified in Section 23 05 93, including, but not limited to, air systems, hydronic systems, plumbing systems, and verification of control systems.
 - b. Complete all applicable tests, certifications, forms, and matrices

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

1.3 WORK SEQUENCE

- A. All work that will produce excessive noise or interference with normal building operations, as determined by the Owner, shall be scheduled with the Owner. It may be necessary to schedule such work during unoccupied hours. The Owner reserves the right to determine when restricted construction hours will be required.
- B. Itemize all work and list associated hours and pay scale for each item.

1.4 DIVISION OF WORK BETWEEN MECHANICAL, ELECTRICAL & CONTROL CONTRACTORS

A. Definitions:

- 1. "Mechanical Contractors" refers to the following:
 - a. Plumbing Contractor.
 - b. Heating Contractor.
 - c. Air Conditioning and Ventilating Contractor.
 - d. Temperature Control Contractor.
 - e. Fire Protection Contractor.
 - f. Testing, Adjusting, and Balancing Contractor.
- 2. Motor Control Wiring: The wiring associated with the remote operation of the magnetic coils of magnetic motor starters or relays, or the wiring that permits direct cycling of motors by means of devices in series with the motor power wiring. In the latter case the devices are usually single phase and are usually connected to the motor power wiring through a manual motor starter having "Manual-Off-Auto" provisions.
- 3. Control devices such as start-stop push buttons, thermostats, pressure switches, flow switches, relays, etc., generally represent the types of equipment associated with motor control wiring.
- 4. Motor control wiring is single phase and usually 120 volts. In some instances, the voltage will be the same as the motor power wiring. Generally, where the motor power wiring exceeds 120 volts, a control transformer is used to give a control voltage of 120 volts.
- 5. Temperature Control Wiring: The wiring associated with the operation of a motorized damper, solenoid valve or motorized valve, etc., either modulating or two-position, as opposed to wiring which directly powers or controls a motor used to drive equipment such as fans, pumps, etc.
 - a. This wiring will be from a 120 volt source and may continue as 120 volt, or be reduced in voltage (24 volt) in which case a control transformer shall be furnished as part of the temperature control wiring.
- 6. Control Motor: An electric device used to operate dampers, valves, etc. It may be two-position or modulating. Conventional characteristics of such a motor are 24 volts, 60 cycles, 1 phase, although other voltages may be encountered.
- 7. Voltage is generally specified and scheduled as distribution voltage. Motor submittals may be based on utilization voltage if it corresponds to the correct distribution voltage.

Distribution/Nominal Voltage	Utilization Voltage
120	115
208	200
240	230
277	265
480	460

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

B. General:

1. The purpose of these Specifications is to outline the Electrical and Mechanical Contractor's responsibilities related to electrical work required for items such as temperature controls, mechanical equipment, fans, chillers, compressors and the like. The exact wiring requirements for much of the equipment cannot be determined until the systems have been selected and submittals reviewed. Therefore, the electrical drawings show only known wiring related to such items. All wiring not shown on the electrical drawings, but required for mechanical systems, is the responsibility of the Mechanical Contractor.
2. Where the drawings require the Electrical Contractor to wire between equipment furnished by the Mechanical Contractor, such wiring shall terminate at terminals provided in the equipment. The Mechanical Contractor shall provide complete electrical power/controls wiring diagrams and supervision to the Electrical Contractor and designate the terminal numbers for correct wiring.
3. All electrical work shall conform to the National Electrical Code. All provisions of the Electrical Specifications concerning wiring, protection, etc., apply to wiring provided by the Mechanical Contractor unless noted otherwise.
4. Control low (24V) and control line (120V) voltage wiring, conduit, and related switches and relays required for the automatic control and/or interlock of motors and equipment, including final connection, are to be furnished and installed under Divisions 21, 22 and 23. Materials and installation to conform to Class 1 or 2 requirements.
5. All Contractors shall establish utility elevations prior to fabrication and shall coordinate their material and equipment with other trades. When a conflict arises, priority is as follows:
 - a. Light fixtures.
 - b. Gravity flow piping, including steam and condensate.
 - c. Electrical busduct.
 - d. Sheet metal.
 - e. Electrical cable trays, including access space.
 - f. Sprinkler piping and other piping.
 - g. Electrical conduits and wireway.

C. Mechanical Contractor's Responsibility:

1. Assumes responsibility for internal wiring of all equipment provided by the Mechanical Contractor, for example:
 - a. Boiler Feed Pumps.
 - b. Burners.
 - c. Chillers.
 - d. Computer Room Air Conditioning Units.
 - e. Condensate Return Stations.
 - f. Condensing Units.
 - g. Makeup Air Units.
 - h. Electric Humidifiers.
 - i. Gas Trains.
 - j. Package Air Handling Units.
 - k. Packaged Rooftop Units.
2. Assumes all responsibility for the Temperature Control wiring, when the Temperature Control Contractor is a Subcontractor to the Mechanical Contractor.
3. Shall verify all existing equipment sizes and capacities where units are to be modified, moved or replaced. Contractor shall notify Architect/Engineer of any discrepancies prior to ordering new units or replacement parts, including replacements of equipment motors.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

4. Temperature Control Subcontractor's Responsibility:
 - a. Wiring of all devices needed to make the Temperature Control System functional.
 - b. Verifying any control wiring on the electrical drawings as being by the Electrical Contractor. All wiring required for the Control System, but not shown on the electrical drawings, is the responsibility of the Temperature Control Subcontractor.
 - c. Coordinating equipment locations (such as relays, transformers, etc.) with the Electrical Contractor, where wiring of the equipment is by the Electrical Contractor.
5. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

D. Electrical Contractor's Responsibility:

1. Provides all combination starters, manual starters and disconnect devices shown on the Electrical Drawings or indicated to be by the Electrical Contractor on the Mechanical Drawings or Specifications.
2. Installs and wires all remote control devices furnished by the Mechanical Contractor or Temperature Control Subcontractor when so noted on the Electrical Drawings.
3. Provides motor control and temperature control wiring, where so noted on the drawings.
4. Coordinate with the Mechanical Contractor for size of motors and/or other electrical devices involved with repair or replacement of existing equipment.
5. Furnishes, installs and connects all relays, etc., for automatic shutdown of certain fans upon actuation of the Fire Alarm System as indicated and specified in Division 28.
6. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

1.5 COORDINATION DRAWINGS

A. Definitions:

1. Coordination Drawings: A compilation of the pertinent layout and system drawings that show the sizes and locations, including elevations, of system components and required access areas to ensure that no two objects will occupy the same space.
 - a. Mechanical trades shall include, but are not limited to, mechanical equipment, ductwork, fire protection systems, plumbing piping, medical gas systems, hydronic piping, steam and steam condensate piping, and any item that may impact coordination with other disciplines.
 - b. Electrical trades shall include, but are not limited to, electrical equipment, conduit 1.5" (40 mm) and larger, conduit racks, cable trays, pull boxes, transformers, raceway, busway, lighting, ceiling-mounted devices, and any item that may impact coordination with other disciplines.
 - c. Technology trades shall include, but are not limited to, technology equipment, racks, conduit 1.5" (40 mm) and larger, conduit racks, cable trays, ladder rack, pull boxes, raceway, ceiling-mounted devices, and any item that may impact coordination with other disciplines.
 - d. Maintenance clearances and code-required dedicated space shall be included.
 - e. The coordination drawings shall include all underground, underfloor, in-floor, in chase, and vertical trade items.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

2. Spaces with open/cloud ceiling architecture shall indicate the overhead utilities and locate equipment as required to maintain clearance above lights. The intent for the installation is to maintain a maximum allowable vertical clearance and an organized/clean manner in the horizontal. Notify Architect/Engineer of the maximum clearance which can be maintained. Failure to comply will result in modifications with no cost to Owner.
 - a. In cloud ceiling architecture, when open cabling/wire and/or cable tray crosses gaps between ceiling clouds and/or walls, cabling is to transition to conduits to span the gaps in order to conceal cabling from below.
 3. The contractors shall use the coordination process to identify the proper sequence of installation of all utilities above ceilings and in other congested areas, to ensure an orderly and coordinated end result, and to provide adequate access for service and maintenance.
- B. Participation:
1. The contractors and subcontractors responsible for work defined above shall participate in the coordination drawing process.
 2. One contractor shall be designated as the Coordinating Contractor for purposes of preparing a complete set of composite electronic CAD coordination drawings that include all applicable trades, and for coordinating the activities related to this process. The Coordinating Contractor for this project shall be the Mechanical Contractor.
 - a. The Coordinating Contractor shall utilize personnel familiar with requirements of this project and skilled as draftspersons/CAD operators, competent to prepare the required coordination drawings.
 3. Electronic CAD drawings shall be submitted to the Coordinating Contractor for addition of work by other trades. IMEG will provide electronic file copies of applicable drawings for contractor's use if the contractor signs and returns an "Electronic File Transfer" waiver provided by IMEG. IMEG will not consider blatant reproductions of original file copies an acceptable alternative for coordination drawings.
- C. Drawing Requirements:
1. The file format and file naming convention shall be coordinated with and agreed to by all contractors participating in the coordination process and the Owner.
 - a. Scale of drawings:
 - 1) General plans: 1/4 Inch = 1'-0" (minimum).
 - 2) Mechanical, electrical, communication rooms, and including the surrounding areas within 10 feet: 1/2 Inch = 1'-0" (minimum).
 - 3) Shafts and risers: 1/2 Inch = 1'-0" (minimum).
 - 4) Sections of shafts and mechanical and electrical equipment rooms: 1/4 Inch = 1'-0" (minimum).
 - 5) Sections of congested areas: 1/2 Inch = 1'-0" (minimum).
 2. Ductwork layout drawings shall be the baseline system for other components. Ductwork layout drawings shall be modified to accommodate other components as the coordination process progresses.
 3. There may be more drawings required for risers, top and bottom levels of mechanical rooms, and shafts.
 4. The minimum quantity of drawings will be established at the first coordination meeting and sent to the Architect/Engineer for review. Additional drawings may be required if other areas of congestion are discovered during the coordination process.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

D. General:

1. Coordination drawing files shall be made available to the Architect/Engineer and Owner's Representative. The Architect/Engineer will only review identified conflicts and give an opinion, but will not perform as a coordinator.
2. A plotted set of coordination drawings shall be available at the project site.
3. Coordination drawings are not shop drawings and shall not be submitted as such.
4. The contract drawings are schematic in nature and do not show every fitting and appurtenance for each utility. Each contractor is expected to have included in the bid sufficient fittings, material, and labor to allow for adjustments in routing of utilities made necessary by the coordination process and to provide a complete and functional system.
5. The contractors will not be allowed additional costs or time extensions due to participation in the coordination process.
6. The contractors will not be allowed additional costs or time extensions for additional fittings, reroutings or changes of duct size, that are essentially equivalent sizes to those shown on the drawings and determined necessary through the coordination process.
7. The Architect/Engineer reserves the right to determine space priority of equipment in the event of spatial conflicts or interference between equipment, piping, conduit, ducts, and equipment provided by the trades.
8. Changes to the contract documents that are necessary for systems installation and coordination shall be brought to the attention of the Architect/Engineer.
9. Access panels shall preferably occur only in gypsum board walls or plaster ceilings where indicated on the drawings.
 - a. Access to mechanical, electrical, technology, and other items located above the ceiling shall be through accessible lay-in ceiling tile areas.
 - b. Potential layout changes shall be made to avoid additional access panels.
 - c. Additional access panels shall not be allowed without written approval from the Architect/Engineer at the coordination drawing stage.
 - d. Providing additional access panels shall be considered after other alternatives are reviewed and discarded by the Architect/Engineer and the Owner's Representative.
 - e. When additional access panels are required, they shall be provided without additional cost to the Owner.
10. Complete the coordination drawing process and obtain sign off of the drawings by all contractors prior to installing any of the components.
11. Conflicts that result after the coordination drawings are signed off shall be the responsibility of the contractor or subcontractor who did not properly identify their work requirements, or installed their work without proper coordination.
12. Updated coordination drawings that reflect as-built conditions may be used as record documents.

1.6 QUALITY ASSURANCE

A. Contractor's Responsibility Prior to Submitting Pricing Data:

1. The Contractor is responsible for constructing complete and operating systems. The Contractor acknowledges and understands that the Contract Documents are a two-dimensional representation of a three-dimensional object, subject to human interpretation. This representation may include imperfect data, interpreted codes, utility guidelines, three-dimensional conflicts, and required field coordination items. Such deficiencies can be corrected when identified prior to ordering material and starting installation. The Contractor agrees to carefully study and compare the individual Contract Documents and report at once in writing to the Design Team any deficiencies the Contractor may discover. The Contractor further agrees to require each subcontractor to likewise study the documents and report at once any deficiencies discovered.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

2. The Contractor shall resolve all reported deficiencies with the Architect/Engineer prior to awarding any subcontracts, ordering material, or starting any work with the Contractor's own employees. Any work performed prior to receipt of instructions from the Design Team will be done at the Contractor's risk.
- B. Qualifications:
1. Only products of reputable manufacturers are acceptable.
 2. All Contractors and subcontractors shall employ only workers skilled in their trades.
- C. Compliance with Codes, Laws, Ordinances:
1. Conform to all requirements of the City of Milan, IL Codes, Laws, Ordinances and other regulations having jurisdiction.
 2. Conform to all State Codes.
 3. If there is a discrepancy between the codes and regulations and these specifications, the Architect/Engineer shall determine the method or equipment used.
 4. If the Contractor notes, at the time of bidding, that any parts of the drawings or specifications do not comply with the codes or regulations, Contractor shall inform the Architect/Engineer in writing, requesting a clarification. If there is insufficient time for this procedure, Contractor shall submit with the proposal a separate price to make the system comply with the codes and regulations.
 5. All changes to the system made after letting of the contract, to comply with codes or requirements of Inspectors, shall be made by the Contractor without cost to the Owner.
 6. If there is a discrepancy between manufacturer's recommendations and these specifications, the manufacturer's recommendations shall govern.
 7. All rotating shafts and/or equipment shall be completely guarded from all contact. Partial guards and/or guards that do not meet all applicable OSHA standards are not acceptable. Contractor is responsible for providing this guarding if it is not provided with the equipment supplied.
- D. Permits, Fees, Taxes, Inspections:
1. Procure all applicable permits and licenses.
 2. Abide by all laws, regulations, ordinances, and other rules of the State or Political Subdivision where the work is done, or as required by any duly constituted public authority.
 3. Pay all charges for permits or licenses.
 4. Pay all fees and taxes imposed by the State, Municipal and/or other regulatory bodies.
 5. Pay all charges arising out of required inspections by an authorized body.
 6. Pay all charges arising out of required contract document reviews associated with the project and as initiated by the Owner or authorized agency/consultant.
 7. Where applicable, all fixtures, equipment and materials shall be approved or listed by Underwriter's Laboratories, Inc.
- E. Utility Company Requirements:
1. Secure from the appropriate private or public utility company all applicable requirements.
 2. Comply with all utility company requirements.
 3. Make application for and pay for service connections, such as gas.
 4. Make application for and pay for all meters and metering systems required by the utility company.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

F. Examination of Drawings:

1. The drawings for the mechanical work are completely diagrammatic, intended to convey the scope of the work and to indicate the general arrangements and locations of equipment, outlets, etc., and the approximate sizes of equipment.
2. Contractor shall determine the exact locations of equipment and rough-ins, and the exact routing of pipes and ducts to best fit the layout of the job.
3. Scaling of the drawings is not sufficient or accurate for determining these locations.
4. Where job conditions require reasonable changes in indicated arrangements and locations, such changes shall be made by the Contractor at no additional cost to the Owner.
5. Because of the scale of the drawings, certain basic items, such as fittings, boxes, valves, unions, etc., may not be shown, but where required by other sections of the specifications or required for proper installation of the work, such items shall be furnished and installed.
6. If an item is either on the drawings or in the specifications, it shall be included in this contract.
7. Determination of quantities of material and equipment required shall be made by the Contractor from the documents. Where discrepancies arise between drawings, schedules and/or specifications, the greater number shall govern.
8. Where used in mechanical documents, the word "furnish" shall mean supply for use, the word "install" shall mean connect complete and ready for operation, and the word "provide" shall mean to supply for use and connect complete and ready for operation.
 - a. Any item listed as furnished shall also be installed, unless otherwise noted.
 - b. Any item listed as installed shall also be furnished, unless otherwise noted.

G. Field Measurements:

1. Verify all pertinent dimensions at the job site before ordering any materials or fabricating any supports, pipes or ducts.

H. Electronic Media/Files:

1. Construction drawings for this project have been prepared utilizing Revit.
2. Contractors and Subcontractors may request electronic media files of the contract drawings and/or copies of the specifications. Specifications will be provided in PDF format.
3. Upon request for electronic media, the Contractor shall complete and return a signed "Electronic File Transmittal" form provided by IMEG.
4. If the information requested includes floor plans prepared by others, the Contractor will be responsible for obtaining approval from the appropriate Design Professional for use of that part of the document.
5. The electronic contract documents can be used for preparation of shop drawings and as-built drawings only. The information may not be used in whole or in part for any other project.
6. The drawings prepared by IMEG for bidding purposes may not be used directly for ductwork layout drawings or coordination drawings.
7. The use of these CAD documents by the Contractor does not relieve them from their responsibility for coordination of work with other trades and verification of space available for the installation.
8. The information is provided to expedite the project and assist the Contractor with no guarantee by IMEG as to the accuracy or correctness of the information provided. IMEG accepts no responsibility or liability for the Contractor's use of these documents.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

1.7 WEB-BASED PROJECT SOFTWARE

- A. The General Contractor shall provide a web-based project software site for the purpose of hosting and managing project communication and documentation until completion of the warranty phase.
- B. The web-based project software shall include, at a minimum, the following features: construction schedule, submittals, RFIs, ASIs, construction change directives, change orders, drawing management, specification management, payment applications, contract modifications, meeting minutes, construction progress photos.
- C. Provide web-based project software user licenses for use by the Architect/Engineer. Access will be provided from the start of the project through the completion of the warranty phase.
- D. At project completion, provide digital archive of entire project in format that is readable by common desktop software applications in format acceptable to Architect/Engineer. Provide data in locked format to prevent further changes.

1.8 SUBMITTALS

- A. Submittals shall be required for the following items, and for additional items where required elsewhere in the specifications or on the drawings.

1. Submittals List:

Referenced Specification	Submittal Item
Section	
23 05 29	Hangers and Supports
23 05 53	HVAC Identification
23 05 93	Testing, Adjusting, and Balancing
23 07 19	HVAC Pipe Insulation
23 22 00	Steam and Condensate Piping Systems and Valves
23 22 18	Traps and Condensate Return Equipment
23 31 00	Ductwork
23 34 23	Power Ventilators
23 34 23	Prefabricated Curbs
23 37 00	Grilles, Registers, and Diffusers
23 82 00	Terminal Heat Transfer Equipment

- B. General Submittal Procedures: In addition to the provisions of Division 01, the following are required:

1. Transmittal: Each transmittal shall include the following:

- a. Date
- b. Project title and number
- c. Contractor's name and address
- d. Division of work (e.g., plumbing, heating, ventilating, etc.)
- e. Description of items submitted and relevant specification number
- f. Notations of deviations from the contract documents
- g. Other pertinent data

2. Submittal Cover Sheet: Each submittal shall include a cover sheet containing:

- a. Date
- b. Project title and number

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

- c. Architect/Engineer
 - d. Contractor and subcontractors' names and addresses
 - e. Supplier and manufacturer's names and addresses
 - f. Division of work (e.g., plumbing, heating, ventilating, etc.)
 - g. Description of item submitted (using project nomenclature) and relevant specification number
 - h. Notations of deviations from the contract documents
 - i. Other pertinent data
 - j. Provide space for Contractor's review stamps
3. Composition:
- a. Submittals shall be submitted using specification sections and the project nomenclature for each item.
 - b. Individual submittal packages shall be prepared for items in each specification section. All items within a single specification section shall be packaged together where possible. An individual submittal may contain items from multiple specifications sections if the items are intimately linked (e.g., pumps and motors).
 - c. All sets shall contain an index of the items enclosed with a general topic description on the cover.
4. Content: Submittals shall include all fabrication, erection, layout, and setting drawings; manufacturers' standard drawings; schedules; descriptive literature, catalogs and brochures; performance and test data; electrical power criteria (e.g., voltage, phase, amps, horsepower, kW, etc.) wiring and control diagrams; Short Circuit Current Rating (SCCR); dimensions; shipping and operating weights; shipping splits; service clearances; and all other drawings and descriptive data of materials of construction as may be required to show that the materials, equipment or systems and the location thereof conform to the requirements of the contract documents.
5. Contractor's Approval Stamp:
- a. The Contractor shall thoroughly review and approve all shop drawings before submitting them to the Architect/Engineer. The Contractor shall stamp, date and sign each submittal certifying it has been reviewed.
 - b. Unstamped submittals will be rejected.
 - c. The Contractor's review shall include, but not be limited to, verification of the following:
 - 1) Only approved manufacturers are used.
 - 2) Addenda items have been incorporated.
 - 3) Catalog numbers and options match those specified.
 - 4) Performance data matches that specified.
 - 5) Electrical characteristics and loads match those specified.
 - 6) Equipment connection locations, sizes, capacities, etc. have been coordinated with other affected trades.
 - 7) Dimensions and service clearances are suitable for the intended location.
 - 8) Equipment dimensions are coordinated with support steel, housekeeping pads, openings, etc.
 - 9) Constructability issues are resolved (e.g., weights and dimensions are suitable for getting the item into the building and into place, sinks fit into countertops, etc.).
 - d. The Contractor shall review, stamp and approve all subcontractors' submittals as described above.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

- e. The Contractor's approval stamp is required on all submittals. Approval will indicate the Contractor's review of all material and a complete understanding of exactly what is to be furnished. Contractor shall clearly mark all deviations from the contract documents on all submittals. If deviations are not marked by the Contractor, then the item shall be required to meet all drawing and specification requirements.
6. Submittal Identification and Markings:
- a. The Contractor shall clearly mark each item with the same nomenclature applied on the drawings or in the specifications.
 - b. The Contractor shall clearly indicate the size, finish, material, etc.
 - c. Where more than one model is shown on a manufacturer's sheet, the Contractor shall clearly indicate exactly which item and which data is intended.
 - d. All marks and identifications on the submittals shall be unambiguous.
7. Schedule submittals to expedite the project. Coordinate submission of related items.
8. Identify variations from the contract documents and product or system limitations that may be detrimental to the successful performance of the completed work.
9. Reproduction of contract documents alone is not acceptable for submittals.
10. Incomplete submittals will be rejected without review. Partial submittals will only be reviewed with prior approval from the Architect/Engineer.
11. Submittals not required by the contract documents may be returned without review.
12. The Architect/Engineer's responsibility shall be to review one set of shop drawing submittals for each product. If the first submittal is incomplete or does not comply with the drawings and/or specifications, the Contractor shall be responsible to bear the cost for the Architect/Engineer to recheck and handle the additional shop drawing submittals.
13. Submittals shall be reviewed and approved by the Architect/Engineer before releasing any equipment for manufacture or shipment.
14. Contractor's responsibility for errors, omissions, or deviation from the contract documents in submittals is not relieved by the Architect/Engineer's approval.
15. Schedule shall allow for adequate time to perform orderly and proper review of submittals, including time for consultants and Owner if required, and resubmittals by Contractor if necessary, and to cause no delay in Work or in activities of Owner or other contractors.
- a. Allow at least two weeks for Architect's/Engineer's review and processing of each submittal.
16. Architect/Engineer reserves the right to withhold action on a submittal which, in the Architect/Engineer's opinion, requires coordination with other submittals until related submittals are received. The Architect/Engineer will notify the Contractor, in writing, when they exercise this right.
- C. Electronic Submittal Procedures:
- 1. Distribution: Email submittals as attachments to all parties designated by the Architect/Engineer, unless a web-based submittal program is used.
 - 2. Transmittals: Each submittal shall include an individual electronic letter of transmittal.
 - 3. Format: Electronic submittals shall be in PDF format only. Scanned copies, in PDF format, of paper originals are acceptable. Submittals that are not legible will be rejected. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

4. File Names: Electronic submittal file names shall include the relevant specification section number followed by a description of the item submitted, as follows. Where possible, include the transmittal as the first page of the PDF instead of using multiple electronic files.
 - a. Submittal file name: 23 XX XX.description.YYYYMMDD
 - b. Transmittal file name: 23 XX XX.description.YYYYMMDD
5. File Size: Files shall be transmitted via a pre-approved method. Larger files may require an alternative transfer method, which shall also be pre-approved.

1.9 SCHEDULE OF VALUES

- A. The requirements herein are in addition to the provisions of Division 01.
- B. Format:
 1. Use AIA Document Continuation Sheets G703 or another similar form approved by the Owner and Architect/Engineer.
 2. Submit in Excel format.
 3. Support values given with substantiating data.
- C. Preparation:
 1. Itemize work required by each specification section and list all providers. All work provided by subcontractors and major suppliers shall be listed on the Schedule of Values. List each subcontractor and supplier by company name.
 2. Break down all costs into:
 - a. Material: Delivered cost of product with taxes paid.
 - b. Labor: Labor cost, excluding overhead and profit.
 3. Itemize the cost for each of the following:
 - a. Overhead and profit.
 - b. Bonds.
 - c. Insurance.
 - d. General Requirements: Itemize all requirements.
 4. For each line item having an installed cost of more than \$5,000, break down costs to list major products or operations under each item. At a minimum, provide material and labor cost line items for the following:
 - a. Each piece of equipment requiring shop drawings (e.g., each air handling unit, pump, exhaust fan, etc.). Use the equipment nomenclature (AHU-1, P-1, EF-1, etc.) on the Schedule of Values.
 - b. Each type of small unitary equipment (e.g., FCUs, UHs, CABs, etc.). Multiple units of the same type can be listed together, provided quantities are also listed so unit costs can be determined.
 - c. Each piping system (chilled water, heating water, steam, condensate, etc.). In addition, for larger projects, break down the material and labor for each piping system based on geography (building, floor, and/or wing).
 - d. Each duct system (supply, return, relief, outside air, etc.) listed separately for each unit they serve (AHU-1 supply air ductwork, AHU-1 return air ductwork, etc.).
 - e. Pipe insulation with separate material and labor line items for each piping system listed above.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

- f. Duct insulation with separate material and labor line items for each duct system listed above.
- g. Temperature controls broken down into material and labor for the following:
 - 1) Engineering
 - 2) Controllers, devices, sensors, etc.
 - 3) Control valves
 - 4) Control dampers
 - 5) Conduit
 - 6) Wiring
 - 7) Programming
 - 8) Commissioning
- h. Site utilities (5' beyond building)
- i. Seismic design
- j. Air balancing
- k. Water balancing
- l. Commissioning
- m. Record drawings
- n. Punchlist and closeout

D. Update Schedule of Values when:

- 1. Indicated by Architect/Engineer.
- 2. Change of subcontractor or supplier occurs.
- 3. Change of product or equipment occurs.

1.10 CHANGE ORDERS

- A. A detailed material and labor takeoff shall be prepared for each change order, along with labor rates and markup percentages. Change orders shall be broken down by sheet or associated individual line item indicated in the change associated narrative, whichever provides the most detailed breakdown. Change orders with inadequate breakdown will be rejected.
- B. Itemized pricing with unit cost shall be provided from all distributors and associated subcontractors.
- C. Change order work shall not proceed until authorized.

1.11 EQUIPMENT SUPPLIERS' INSPECTION

- A. The following equipment shall not be placed in operation until a competent installation and service representative of the manufacturer has inspected the installation and certified that the equipment is properly installed, adjusted and lubricated; that preliminary operating instructions have been given; and that the equipment is ready for operation:
 - 1. Air Cooled Condensers
 - 2. Base Mounted Pumps
 - 3. Boilers, Burners and Boiler Trim
 - 4. Computer Room Units
 - 5. Condensing Units
 - 6. Cooling Towers
 - 7. Gas Fired Makeup Air Units
 - 8. Fire Seal Systems
 - 9. Fluid Coolers
 - 10. Seismic Restraints and Equipment Bracing
 - 11. Water Chillers

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

- B. Contractor shall arrange for and obtain supplier's on-site inspection(s) at proper time(s) to assure each phase of equipment installation and/or connection is in accordance with the manufacturer's instructions.
- C. Submit copies of start-up reports to the Architect/Engineer and include copies of Owner's Operation and Maintenance Manuals.

1.12 PRODUCT DELIVERY, STORAGE, HANDLING & MAINTENANCE

- A. Exercise care in transporting and handling to avoid damage to materials. Store materials on the site to prevent damage. Keep materials clean, dry and free from harmful conditions. Immediately remove any materials that become wet or that are suspected of becoming contaminated with mold or other organisms.
- B. Protect equipment, components, and openings with airtight covers and exercise care at every stage of storage, handling, and installation of equipment to prevent airborne dust and dirt from entering or fouling equipment to include, but not limited to:
 - 1. Motor windings and ventilation openings.
 - 2. Bearings.
 - 3. Equipment Pipe and Accessories connections openings. (e.g. boiler connections, coil connections, etc.)
 - 4. Equipment Duct and Accessories connections openings. (e.g. AHU/RTU duct connections; Terminal Air Boxes, etc.)
 - 5. Starter and control cabinets.
 - 6. Heat transfer coils.
 - 7. Pump Seals.
 - 8. Combustion burner and blower equipment (e.g. combustion air intake, combustion vent/flue, etc.)
- C. Equipment and components that are visibly damaged or have been subject to environmental conditions prior to building turnover to Owner that could shorten the life of the component (for example, water damage, humidity, dust and debris, excessive hot or cold storage location, etc.) shall be repaired or replaced with new equipment or components without additional cost to the building owner.
- D. Keep all bearings properly lubricated and all belts properly tensioned and aligned.
- E. Coordinate the installation of heavy and large equipment with the General Contractor and/or Owner. If the Mechanical Contractor does not have prior documented experience in rigging and lifting similar equipment, he/she shall contract with a qualified lifting and rigging service that has similar documented experience. Follow all equipment lifting and support guidelines for handling and moving.
- F. Contractor is responsible for moving equipment into the building and/or site. Contractor shall review site prior to bid for path locations and any required building modifications to allow movement of equipment. Contractor shall coordinate the work with other trades.

1.13 NETWORK / INTERNET CONNECTED EQUIPMENT

- A. These specifications may require certain equipment or systems to have network, Internet and/or remote access capability ("Network Capability"). Any requirement for Network Capability shall be interpreted only as a functional capability and is not to be construed as authority to connect or enable any Network Capability. Network Capability may only be connected or enabled with the express written consent of the Owner.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

1.14 WARRANTY

- A. Provide one-year warranty, unless otherwise noted, to the Owner for all fixtures, equipment, materials, and workmanship.
- B. The warranty period for all work in this Division of the specifications shall commence on the date of final acceptance, unless a whole or partial system or any separate piece of equipment or component is put into use for the benefit of any party other than the installing contractor with prior written authorization. In this instance, the warranty period shall commence on the date when such whole system, partial system or separate piece of equipment or component is placed in operation and accepted in writing by the Owner.
- C. Warranty requirements shall extend to correction, without cost to the Owner, of all Work found to be defective or nonconforming to the contract documents. The Contractor shall bear the cost of correcting all damage resulting from defects or nonconformance with contract documents.

1.15 INSURANCE

- A. Contractor shall maintain insurance coverage as set forth in Division 0 of these specifications.

1.16 MATERIAL SUBSTITUTION

- A. Where several manufacturers' names are given, the scheduled manufacturer is the basis for job design and establishes the quality required.
- B. Equivalent equipment manufactured by the other listed manufacturers may be used. Contractor shall ensure that all items submitted by these other manufacturers meet all requirements of the drawings and specifications and fits in the allocated space. When using other listed manufacturers, the Contractor shall assume responsibility for any and all modifications necessary (including, but not limited to structural supports, electrical connections, piping and ductwork connections and arrangement, plumbing connections and rough-in, and regulatory agency approval, etc.) and coordinate such with other contractors.
- C. Any material, article or equipment of other unnamed manufacturers which will adequately perform the services and duties imposed by the design and is of a quality equal to or better than the material, article or equipment identified by the drawings and specifications may be used if approval is secured in writing from the Architect/Engineer not later than ten days prior to the bid opening.
- D. This Contractor assumes all costs incurred as a result of using the offered material, article or equipment, on the Contractors part or on the part of other Contractors whose work is affected.
- E. This Contractor may list voluntary add or deduct prices for alternate materials on the bid form. These items will not be used in determining the low bidder.
- F. All material substitutions requested later than ten (10) days prior to bid opening must be listed as voluntary changes on the bid form.

PART 2 - PRODUCTS (Not Used)

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

PART 3 - EXECUTION

3.1 JOBSITE SAFETY

- A. Neither the professional activities of the Architect/Engineer, nor the presence of the Architect/Engineer or the employees and subconsultants at a construction site, shall relieve the Contractor and other entity of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending or coordinating all portions of the work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The Architect/Engineer and personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Contractor is solely responsible for jobsite safety. The Architect/Engineer and the Architect/Engineer's consultants shall be indemnified and shall be made additional insureds under the Contractor's general liability insurance policy.

3.2 ARCHITECT/ENGINEER OBSERVATION OF WORK

- A. The Contractor shall provide seven (7) calendar days' notice to the Architect/Engineer prior to:
1. Placing fill over underground and underslab utilities.
 2. Covering exterior walls, interior partitions and chases.
 3. Installing hard or suspended ceilings and soffits.
- B. The Architect/Engineer will have the opportunity to review the installation and provide a written report noting deficiencies requiring correction. The Contractor's schedule shall account for these reviews and show them as line items in the approved schedule.
- C. Above-Ceiling Final Observation
1. All work above the ceilings must be complete prior to the Architect/Engineer's review. This includes, but is not limited to:
 - a. Pipe insulation is installed and fully sealed.
 - b. Pipe and duct wall penetrations are sealed.
 - c. Pipe identification and valve tags are installed.
 - d. Main, branch and flexible ducts are installed.
 - e. Diffusers, registers and grilles are installed and connected to ductwork.
 - f. Terminal air box reheat coil piping or wiring is complete.
 - g. Terminal air box control wiring is complete and all control boxes are closed.
 2. In order to prevent the Above-Ceiling Final Observation from occurring too early, the Contractor shall review the status of the work and certify, in writing, that the work is ready for the Above-Ceiling Final Observation.
 3. It is understood that if the Architect/Engineer finds the ceilings have been installed prior to this review and prior to 7 days elapsing, the Architect/Engineer may not recommend further payments to the contractor until such time as full access has been provided.

3.3 PROJECT CLOSEOUT

- A. The following paragraphs supplement the requirements of Division 01.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

B. Final Jobsite Observation:

1. In order to prevent the Final Jobsite Observation from occurring too early, the Contractor is required to review the completion status of the project and certify that the job is ready for the final jobsite observation.
2. Attached to the end of this section is a typical list of items that represent the degree of job completeness expected prior to requesting a review.
3. Upon Contractor certification that the project is complete and ready for a final observation, the Contractor shall sign the attached certification and return it to the Architect/Engineer so that the final observation can be scheduled.
4. It is understood that if the Architect/Engineer finds the job not ready for the final observation and that additional trips and observations are required to bring the project to completion, the costs incurred by the Architect/Engineer's additional time and expenses will be deducted from the Contractor's contract retainage prior to final payment at the completion of the job.

C. Before final payment is authorized, this Contractor must submit the following:

1. Operation and maintenance manuals with copies of approved shop drawings.
2. Record documents including marked-up or reproducible drawings and specifications.
3. A report documenting the instructions given to the Owner's representatives complete with the number of hours spent in the instruction. The report shall bear the signature of an authorized agent of This Contractor and shall be signed by the Owner's representatives.
4. Inspection by State Boiler Inspector.
5. Start-up reports on all equipment requiring a factory installation inspection or start-up.
6. Provide spare parts, maintenance, and extra materials in quantities specified in individual specification sections. Deliver to project site and place in location as directed; receipt by Architect/Engineer required prior to final payment approval.

3.4 OPERATION AND MAINTENANCE MANUALS

A. General:

1. Provide an electronic copy of the O&M manuals as described below for Architect/Engineer's review and approval. The electronic copy shall be corrected as required to address the Architect/Engineer's comments. Once corrected, electronic copies and paper copies shall be distributed as directed by the Architect/Engineer.
2. Approved O&M manuals shall be completed and in the Owner's possession prior to Owner's acceptance and at least 10 days prior to instruction of operating personnel.

B. Electronic Submittal Procedures:

1. Distribution: Email the O&M manual as attachments to all parties designated by the Architect/Engineer.
2. Transmittals: Each submittal shall include an individual electronic letter of transmittal.
3. Format: Electronic submittals shall be in PDF format only. Scanned copies, in PDF format, of paper originals are acceptable. Submittals that are not legible will be rejected. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.
4. File Names: Electronic submittal file names shall include the relevant specification section number followed by a description of the item submitted, as follows. Where possible, include the transmittal as the first page of the PDF instead of using multiple electronic files.
 - a. O&M file name: O&M.div23.contractor.YYYYMMDD
 - b. Transmittal file name: O&Mtransmittal.div23.contractor.YYYYMMDD

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

5. File Size: Files shall be transmitted via a pre-approved method. Larger files may require an alternative transfer method, which shall also be pre-approved.
6. Provide the Owner with an approved copy of the O&M manual on compact discs (CD), digital video discs (DVD), or flash drives with a permanently affixed label, printed with the title "Operation and Maintenance Instructions", title of the project and subject matter of disc/flash drive when multiple disc/flash drives are required.
7. All text shall be searchable.
8. Bookmarks shall be used, dividing information first by specification section, then systems, major equipment and finally individual items. All bookmark titles shall include the nomenclature used in the construction documents and shall be an active link to the first page of the section being referenced.

C. Operation and Maintenance Instructions shall include:

1. Title Page: Include title page with project title, Architect, Engineer, Contractor, all subcontractors, and major equipment suppliers, with addresses, telephone numbers, website addresses, email addresses and point of contacts. Website URLs and email addresses shall be active links in the electronic submittal.
2. Table of Contents: Include a table of contents describing specification section, systems, major equipment, and individual items.
3. Copies of all final approved shop drawings and submittals. Include Architect's/Engineer's shop drawing review comments. Insert the individual shop drawing directly after the Operation and Maintenance information for the item(s) in the review form.
4. Refer to Section 23 09 00 for additional requirements for Temperature Control submittals.
5. Copy of final approved test and balance reports.
6. Copies of all factory inspections and/or equipment startup reports.
7. Copies of warranties.
8. Schematic electrical power/controls wiring diagrams of the equipment that have been updated for field conditions. Field wiring shall have label numbers to match drawings.
9. Dimensional drawings of equipment.
10. Capacities and utility consumption of equipment.
11. Detailed parts lists with lists of suppliers.
12. Operating procedures for each system.
13. Maintenance schedule and procedures. Include a chart listing maintenance requirements and frequency.
14. Repair procedures for major components.
15. List of lubricants in all equipment and recommended frequency of lubrication.
16. Instruction books, cards, and manuals furnished with the equipment.

3.5 INSTRUCTING THE OWNER'S REPRESENTATIVES

- A. Adequately instruct the Owner's designated representatives in the maintenance, care, and operation of all systems installed under this contract.
- B. The Owner has the option to make a video recording of all instructions. Coordinate schedule of instructions to facilitate this recording.
- C. The instructions shall include:
 1. Explanation of all system flow diagrams.
 2. Explanation of all air handling systems.
 3. Temperature control system operation including calibration, adjustment and proper operating conditions of all sensors.
 4. Maintenance of equipment.
 5. Start-up procedures for all major equipment.
 6. Explanation of seasonal system changes.
 7. Description of emergency system operation.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

D. Notify the Architect/Engineer of the time and place for the verbal instructions to be given to the Owner's representative so a representative can attend if desired.

E. Operating Instructions:

1. Contractor is responsible for all instructions to the Owner's representatives for the mechanical and control systems.
2. If the Contractor does not have staff that can adequately provide the required instructions the Contractor shall include in the bid an adequate amount to reimburse the Owner for the Architect/Engineer to perform these services.

3.6 SYSTEM STARTING AND ADJUSTING

- A. The mechanical systems shall be complete and operating. System startup, testing, adjusting, and balancing to obtain satisfactory system performance is the responsibility of the Contractor. This includes calibration and adjustments of all controls, noise level adjustments and final comfort adjustments as required.
- B. Complete all manufacturer-recommended startup procedures and checklists to verify proper motor rotation, electrical power voltage is within equipment limitations, equipment controls maintain pressures and temperatures within acceptable ranges, all filters and protective guards are in-place, acceptable access is provided for maintenance and servicing, and equipment operation does not pose a danger to personnel or property.
- C. Operate all HVAC systems continuously for at least one week prior to occupancy to bring construction materials to suitable moisture levels. Areas with mechanical cooling shall be maintained below 60% RH.
- D. Contractor shall adjust the mechanical systems and controls at season changes during the one year warranty period, as required, to provide satisfactory operation and to prove performance of all systems in all seasons.
- E. All operating conditions and control sequences shall be tested during the start-up period. Test all interlocks, safety shutdowns, controls, and alarms.
- F. The Contractor, subcontractors, and equipment suppliers shall have skilled technicians to ensure that all systems perform properly. If the Architect/Engineer is requested to visit the job site for trouble shooting, assisting in start-up, obtaining satisfactory equipment operation, resolving installation and/or workmanship problems, equipment substitution issues or unsatisfactory system performance, including call backs during the warranty period, through no fault of the design; the Contractor shall reimburse the Owner on a time and materials basis for services rendered at the Architect/Engineer's standard hourly rates in effect when the services are requested. The Contractor shall pay the Owner for services required that are product, installation or workmanship related. Payment is due within 30 days after services are rendered.

3.7 RECORD DOCUMENTS

- A. The following paragraphs supplement Division 01 requirements.
- B. Maintain at the job site a separate and complete set of mechanical drawings and specifications with all changes made to the systems clearly and permanently marked in complete detail.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

- C. Mark drawings to indicate revisions to piping and ductwork, size and location, both exterior and interior; including locations of coils, dampers, other control devices, filters, and other units requiring periodic maintenance or repair; actual equipment locations, dimensioned from column lines; actual inverts and locations of underground piping; concealed equipment, dimensioned from column lines; mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (e.g., traps, strainers, expansion compensators, tanks, etc.); Change Orders; concealed control system devices.
- D. Refer to Section 23 09 00 for additional requirements for Temperature Control documents.
- E. Before completion of the project, a set of reproducible mechanical drawings will be given to the Contractor for transfer of all as-built conditions from the paper set maintained at the job site. All marks on reproducibles shall be clear and permanent.
- F. Mark specifications to show approved substitutions; Change Orders, and actual equipment and materials used.
- G. Record changes daily and keep the marked drawings available for the Architect/Engineer's examination at any normal work time.
- H. Upon completing the job, and before final payment is made, give the marked-up drawings to the Architect/Engineer.

3.8 ADJUST AND CLEAN

- A. Thoroughly clean all equipment and systems prior to the Owner's final acceptance of the project. Clean all foreign paint, grease, oil, dirt, labels, stickers, and other foreign material from all equipment.
- B. Clean all drain pans and areas where moisture is present. Immediately report any mold, biological growth, or water damage.
- C. Remove all rust, scale, dirt, oils, stickers and thoroughly clean exterior of all exposed bare metal ductwork, piping, hangers, and accessories.
- D. Remove all rubbish, debris, etc., accumulated during construction from the premises.

3.9 SPECIAL REQUIREMENTS

- A. Contractor shall coordinate the installation of all equipment, valves, dampers, operators, etc., with other trades to maintain clear access area for servicing.
- B. All equipment shall be installed in such a way to maximize access to parts needing service or maintenance. Review the final field location, placement, and orientation of equipment with the Owner's designated representative prior to setting equipment.
- C. Installation of equipment or devices without regard to coordination of access requirements and confirmation with the Owner's designated representative will result in removal and reinstallation of the equipment at the Contractor's expense.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

3.10 IAQ MAINTENANCE FOR OCCUPIED FACILITIES UNDER CONSTRUCTION

- A. Contractors shall make all reasonable efforts to prevent construction activities from affecting the air quality of the occupied areas of the building or outdoor areas near the building. These measures shall include, but not be limited to:
1. All contractors shall endeavor to minimize the amount of contaminants generated during construction. Methods to be employed shall include, but not be limited to:
 - a. Minimizing the amount of dust generated.
 - b. Reducing solvent fumes and VOC emissions.
 - c. Maintain good housekeeping practices, including sweeping and periodic dust and debris removal. There should be no visible haze in the air.
 - d. Protect stored on-site and installed absorptive materials from moisture damage.
 2. Request that the Owner designate an IAQ representative.
 3. Review and receive approval from the Owner's IAQ representative for all IAQ-related construction activities and negative pressure containment plans.
 4. Inform the IAQ representative of all conditions that could adversely impact IAQ, including operations that will produce higher than normal dust production or odors.
 5. Schedule activities that may cause IAQ conditions that are not acceptable to the Owner's IAQ representative during unoccupied periods.
 6. Request copies of and follow all of the Owner's IAQ and infection control policies.
 7. Unless no other access is possible, the entrance to construction site shall not be through the existing facility.
 8. To minimize growth of infectious organisms, do not permit damp areas in or near the construction area to remain for over 24 hours.
 9. In addition to the criteria above, provide measures as recommended in the SMACNA "IAQ Guidelines for Occupied Buildings Under Construction".
 10. If permanently installed air handlers are used to serve both construction and occupied areas, all return grilles throughout construction areas shall be sealed to prevent air from construction areas being supplied to occupied areas.
 11. If permanently installed air handlers are used during construction to serve only construction areas and do not supply air to adjacent occupied areas, MERV 8 filtration media shall be used to protect each return air grille or opening. The intent of this will be to prevent construction dust and debris from entering any return or supply air ductwork in the facility. All filtration media shall be replaced immediately prior to occupancy.
 12. Construction areas shall be maintained at a negative pressure at all times during construction. When areas are under construction, HEPA filtered exhaust fan(s) shall be installed in sufficient quantities as required to maintain construction areas at sufficient negative pressure as called for in the Owner's Infection Control Risk Assessment (ICRA). HEPA filtered exhaust fan discharge shall be ducted either outdoors or back into designated hospital areas as called for in the Owner's ICRA.
 13. For each area under construction, the Contractor shall install a negative pressure indicator equivalent to Lamiflow Model L-102F as manufactured by Lamiflow Technologies. Contractor shall regularly monitor and record the negative pressure condition of the construction areas as called for in the Owner's ICRA.

3.11 MAINTAINING CLEAN DUCTWORK THROUGHOUT CONSTRUCTION

- A. Throughout the duration of construction, all ductwork shall be capped or sealed with sheet metal caps, polyethylene film, or other airtight protective to keep dust, dirt, and construction debris out of ducts. Similar means shall be used to seal air-side connections of HVAC equipment to include, but not limited to, air handling units, fans, terminal air boxes, fan coil units, cabinet heaters, blower coils, and the like.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

- B. When air terminal devices are installed, contractors shall seal all supply, return, and exhaust grilles with polyethylene film or other airtight protective to keep dust, dirt, and construction debris out of ducts.
- C. Should HVAC equipment be started during construction, Contractor shall remove airtight protectives and shall install one-inch thick MERV 8 filter media over all return and exhaust grilles to prevent dust, dirt, and construction debris from entering ductwork. Filter media shall cover the entire grille face and shall be secured such that air cannot bypass filter media.
- D. Should filter media become laden with dust and dirt, Contractor shall replace filter media with new media to prevent damage to air distribution system and equipment.
- E. The following steps shall be taken during testing, adjusting, and balancing of each air system:
 - 1. All construction activities in all spaces served by the air system shall stop.
 - 2. All airtight protectives and temporary filter media shall be removed from all portions of the air system.
 - 3. Testing, adjusting, and balancing work shall not commence until all construction activity is stopped and all airtight protectives and temporary filter media is removed.
 - 4. Once testing, adjusting, and balancing work is complete for the air system, airtight protectives or temporary filter media shall be installed over all ductwork openings and air terminals on the air system prior to resuming construction activities in any spaces served by the air system.
- F. The Owner shall agree the building is sufficiently clean prior to the removal of any filtration media and airtight protectives from air terminal devices.

3.12 UTILITY REBATE

- A. Submit utility rebate forms, where offered at project location, with rebate items completed. Rebate may include lighting, lighting controls, variable speed drives, heat pumps, package terminal A/C, air conditioners, chillers, water heaters, programmable thermostats, and motors.
- B. Contractor must submit notification of any value engineering or product substitution that will affect the utility rebate amount prior to approval.

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

READINESS CERTIFICATION PRIOR TO FINAL JOBSITE OBSERVATION

To prevent the final job observation from occurring too early, we require that the Contractor review the completion status of the project and, by copy of this document, certify that the job is indeed ready for the final job observation. The following is a typical list of items that represent the degree of job completeness expected prior to your requesting a final job observation.

1. Penetrations fire sealed and labeled in accordance with specifications.
2. All air handling units operating and balanced.
3. All fans shall be operating and balanced.
4. All pumps, boilers and chillers operating and balanced.
5. All miscellaneous mechanical systems (unit heaters, fan coil units, cabinet heaters, etc.) operating.
6. All temperature control systems operating, programmed and calibrated.
7. Pipe insulation complete, pipes labeled and valves tagged.
8. Fire damper and fire/smoke damper access doors labeled in accordance with specifications.

Accepted by:

Prime Contractor _____

By _____ Date _____

Upon Contractor certification that the project is complete and ready for a final job observation, we require the Contractor to sign this agreement and return it to the Architect/Engineer so that the final observation can be scheduled.

It is understood that if the Architect/Engineer finds the job not ready for the final observation and that additional trips and observations are required to bring the project to completion, the costs incurred by the Architect/Engineers for additional time and expenses will be deducted from the Contractor's contract retainage prior to final payment at the completion of the job.

END OF SECTION 230500

SECTION 23 05 05
HVAC DEMOLITION FOR REMODELING

SECTION 23 05 05 - HVAC DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Mechanical demolition.
- B. Cutting and Patching.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment shall be as specified in individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. THE DRAWINGS ARE INTENDED TO INDICATE THE GENERAL SCOPE OF WORK AND DO NOT SHOW EVERY PIPE, DUCT, OR PIECE OF EQUIPMENT THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY CONDITIONS PRIOR TO SUBMITTING A BID.
- B. Where walls, ceilings, etc., are shown as being removed on general drawings, the Contractor shall remove all mechanical equipment, devices, fixtures, piping, ducts, systems, etc., from the removed area.
- C. Where ceilings, walls, partitions, etc., are temporarily removed and replaced by others, This Contractor shall remove, store, and replace equipment, devices, fixtures, pipes, ducts, systems, etc.
- D. Verify that abandoned utilities serve only abandoned equipment or facilities. Extend services to facilities or equipment that shall remain in operation following demolition.
- E. Coordinate work with all other Contractors and the Owner. Schedule removal of equipment to avoid conflicts.
- F. This Contractor shall verify all existing equipment sizes and capacities where equipment is scheduled to be replaced or modified, prior to ordering new equipment.
- G. Bid submittal shall mean the Contractor has visited the project site and verified existing conditions and scope of work.

3.2 PREPARATION

- A. Disconnect mechanical systems in walls, floors, and ceilings scheduled for removal.
- B. Provide temporary connections to maintain existing systems in service during construction. When work must be performed on operating equipment, use personnel experienced in such operations.

SECTION 23 05 05
HVAC DEMOLITION FOR REMODELING

- C. Existing Heating System: Maintain existing system in service until new system is complete and ready for service. Drain system only to make switchovers and connections. Obtain permission from the Owner at least 48 hours before partially or completely draining system. Minimize outage duration.

3.3 DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK

- A. Demolish and extend existing mechanical work under provisions of Division 2 and this Section.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Remove abandoned ducts and piping to source of supply and/or main lines.
- D. Remove exposed abandoned pipes and ducts, including abandoned pipes and ducts above accessible ceilings. Cut ducts flush with walls and floors, cap duct that remains, and patch surfaces. Cut pipes above ceilings, below floors and behind walls. Cap remaining lines. Repair building construction to match original. Remove all clamps, hangers, supports, etc. associated with pipe and duct removal.
- E. Disconnect and remove mechanical devices and equipment serving equipment that has been removed.
- F. Repair adjacent construction and finishes damaged during demolition and extension work.
- G. Maintain access to existing mechanical installations which remain. Modify installation or provide access panels as appropriate.
- H. Remove unused sections of supply and return air ductwork back to mains. Patch opening with sheet metal and seal airtight. Patch existing insulation to match existing. Where existing ductwork is to be capped and reused, locate the end cap within 6" of the last branch. End caps shall be 3" pressure class and seal class "A".
- I. Extend existing installations using materials and methods compatible with existing installations, or as specified.
- J. Properly reclaim and dispose of all refrigerant in demolished equipment and as required for extension of existing equipment.

3.4 CUTTING AND PATCHING

- A. This Contractor is responsible for all penetrations of existing construction required to complete the work of this project. Refer to Section 23 05 29 for additional requirements.
- B. Penetrations in existing construction should be reviewed carefully prior to proceeding with any work.
- C. Penetrations shall be neat and clean with smooth and/or finished edges. Core drill where possible for clean opening.
- D. Repair existing construction as required after penetration is complete to restore to original condition. Use similar materials and match adjacent construction unless otherwise noted or agreed to by the Architect/Engineer prior to start of work.
- E. Floor slabs may contain conduit systems. This Contractor is responsible for taking any measures required to ensure no conduits or other services are damaged. This includes X-ray or similar non-destructive means.

SECTION 23 05 05
HVAC DEMOLITION FOR REMODELING

- F. This Contractor is responsible for all costs incurred in repair, relocations, or replacement of any cables, conduits, or other services if damaged without proper investigation.

3.5 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment which remain or are to be reused.
- B. Clean all systems adjacent to project which are affected by the dust and debris caused by this construction.
- C. MECHANICAL ITEMS REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE OWNER IN A LOCATION COORDINATED WITH THE OWNER. THE CONTRACTOR SHALL DISPOSE OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.

3.6 SPECIAL REQUIREMENTS

- A. Install temporary filter media over outside air intakes which are within 100 feet of the limits of construction or as noted on the drawings. This Contractor shall complete any cleaning required for existing systems which are affected by construction dust and debris.
- B. Review locations of all new penetrations in existing floor slabs or walls. Determine construction type and review for possible interferences. Bring all concerns to the attention of the Architect/Engineer before proceeding.

END OF SECTION 230505

SECTION 23 05 29
HVAC SUPPORTS AND ANCHORS

SECTION 23 05 29 - HVAC SUPPORTS AND ANCHORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Hangers, Supports, and Associated Anchors.
- B. Equipment Bases and Supports.
- C. Sleeves and Seals.
- D. Flashing and Sealing of Equipment and Pipe Stacks.
- E. Cutting of Openings.
- F. Escutcheon Plates and Trim.

1.2 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 23 05 00. Include plastic pipe manufacturers' support spacing requirements.

1.3 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

- A. Furnish sleeves and hanger inserts to General Contractor for placement into formwork.

PART 2 - PRODUCTS

2.1 HANGER RODS

- A. Hanger rods for single rod hangers shall conform to the following:
 - 1. Steel Pipe:
 - a. Hanger Rod Diameter:
 - 1) 2-1/2" and smaller: 3/8"
 - 2) 3" through 3-5/8": 3/8"
 - 3) 4" through 6": 1/2"
 - 4) 8": 5/8"
 - 5) 10": 3/4"
 - 6) 12": 7/8"
 - 7) 14" and 16": 1"
 - 8) 18" and 24": 1-1/4"
- B. Rods for double rod hangers may be reduced one size. Minimum rod diameter is 3/8 inches.
- C. Hanger rods and accessories used in mechanical spaces or otherwise dry areas shall have ASTM B633 electro-plated zinc finish.

SECTION 23 05 29
HVAC SUPPORTS AND ANCHORS

- D. All hanger rods, nuts, washers, clevises, etc., in damp areas shall have ASTM A123 hot-dip galvanized finish applied after fabrication. This applies to the following areas:

1. Locker Rooms
2. Restrooms with Showers.

2.2 PIPE AND STRUCTURAL SUPPORTS

A. General:

1. Pipe hangers, clamps, and supports shall conform to Manufacturers Standardization Society MSS SP-58, 69, 89, and 127 (where applicable).
2. On all insulated piping, provide at each support an insert of same thickness and contour as adjoining insulation, between the pipe and insulation jacket, to prevent insulation from sagging and crushing. Refer to insulation specifications for materials and additional information.

B. Vertical Supports:

1. Support and laterally brace vertical pipes at every floor level in multi-story structures, unless otherwise noted by applicable codes, but never at intervals over 15 feet. Support vertical pipes with riser clamps installed below hubs, couplings, or lugs. Provide sufficient flexibility to accommodate expansion and contraction to avoid compromising fire barrier penetrations or stressing piping at fixed takeoff locations.

a. Products:

- 1) Eaton Fig B3373 Series
- 2) nVent 510 Series
- 3) Anvil Fig. 90

2. Cold Pipe: Place restrained neoprene mounts beneath vertical pipe riser clamps to prevent sweating of cold pipes. Select neoprene mounts based on the weight of the pipe to be supported. Insulate over mounts.

a. Products:

- 1) Mason RBA, RCA or RDA
- 2) Mason BR

3. Cold Pipe Alternative: Insulated pipe riser clamp with no thermal bridging between clamp and pipe; water repellant calcium silicate insulation material adhered inside the clamp; ASTM A653 galvanized steel clamp.

a. Products:

- 1) Pipeshields E100

4. Wall supports shall be used where vertical height of structure exceeds minimum spacing requirements. Install wall supports at same spacing as hangers or strut supports along vertical length of pipe runs. Wall supports shall be coordinated with the Structural Engineer.

SECTION 23 05 29
HVAC SUPPORTS AND ANCHORS

5. Masonry Anchors: Fasten to concrete masonry units with expansion anchors or self-tapping masonry screws. For expansion anchors into hollow concrete block, use sleeve-type anchors designed for the specific application. Do not fasten in masonry joints. Do not use powder actuated fasteners, wooden plugs, or plastic inserts.

C. Hangers and Clamps:

1. Oversize all hangers, clamps, and supports on insulated piping to allow insulation and jacket to pass through unbroken. This applies to both hot and cold pipes.
2. Hangers in direct contact with bare copper pipe shall include plastic pipe insert similar to Unistrut Cush-A-Clamp, Hydra-Zorb, nVent Cushion Clamp or Eaton Vibra-Clamp within their temperature limits of -65°F to +275°F.
3. On all insulated piping, provide a semi-cylindrical metallic shield and vapor barrier jacket.
4. Ferrous hot piping 4 inches and larger shall have steel saddles tack welded to the pipe at each support with a depth not less than specified for the insulation. Factory fabricated inserts may be used.

a. Products:

- 1) Anvil Fig. 160, 161, 162, 163, 164, 165
- 2) Eaton Fig. 3160, 3161, 3162, 3163, 3164, 3165
- 3) nVent Model 630, 631, 632, 633, 634, 635

5. Unless otherwise indicated, hangers shall be as follows:

a. Clevis Type: Service: Bare Metal Pipe, Rigid Plastic Pipe, Insulated Cold Pipe, Insulated Hot Pipe - 3 inches and Smaller:

1) Products: Bare Steel, Plastic or Insulated Pipe:

- a) Anvil Fig. 260
- b) Eaton Fig. 3100
- c) nVent Model 400

6. Support may be fabricated from U-channel strut or similar shapes. Piping less than 4" in diameter shall be secured to strut with clamps of proper design and capacity as required to maintain spacing and alignment. Strut shall be independently supported from hanger drops or building structure. Size and support shall be per manufacturer's installation requirements for structural support of piping. Clamps shall not interrupt piping insulation.

- a. Strut used in mechanical spaces or otherwise dry areas shall have ASTM B633 electro-plated zinc finish.
- b. Strut used in damp areas listed in hanger rods shall have ASTM A123 hot-dip galvanized finish applied after fabrication.

7. Unless otherwise indicated, pipe supports for use with struts shall be as follows:

a. Clamp Type: Service: Bare Metal Pipe, Rigid Plastic Pipe, Insulated Cold Pipe, Insulated Hot Pipe - 3 inches and smaller:

- 1) Clamps in direct contact with copper pipe shall include plastic pipe insert similar to Unistrut Cush-A-Clamp, Hydra-Zorb, nVent Cushion Clamp or Eaton Vibra-Clamp.
- 2) Pipes subject to expansion and contraction shall have clamps oversized to allow limited pipe movement.

SECTION 23 05 29
HVAC SUPPORTS AND ANCHORS

3) Products: Bare Steel, Plastic or Insulated Pipe:

- a) Unistrut Fig. P1100 or P2500
- b) Eaton Fig. B2000 or B2400
- c) Anvil Fig. AS1200
- d) nVent USC

4) Products: Bare Copper Pipe:

- a) Eaton Fig. BVT
- b) nVent CADDY Cushion Clamp

D. Upper (Structural) Attachments:

1. Unless otherwise shown, upper attachments for hanger rods or support struts shall be as follows:

a. Steel Structure Clamps: C-Type Wide Flange Beam Clamps (for use on top and/or bottom of wide flanges. Not permitted for use with bar-joists.):

1) Products:

- a) Anvil Fig. 86
- b) Eaton Fig. B3033/B3034
- c) nVent Model 300 & 310

b. Scissor Type Beam Clamps (for use with bar-joists and wide flange):

1) Products:

- a) Anvil Fig. 228, 292
- b) Eaton Fig. B3054
- c) nVent Model 360

c. Concentrically Loaded Open Web Joist Hangers (for use with bar joists):

1) Products:

- a) MCL. M1, M2 or M3

d. Concrete Anchors: Fasten to concrete using cast-in or post-installed anchors designed per the requirements of Appendix D of ACI 318-05. Post-installed anchors shall be qualified for use in cracked concrete by ACI-355.2.

e. Masonry Anchors: Fasten to concrete masonry units with expansion anchors or self-tapping masonry screws. For expansion anchors into hollow concrete block, use sleeve-type anchors designed for the specific application. Do not fasten in masonry joints. Do not use powder actuated fasteners, wooden plugs, or plastic inserts.

f. Steel Structure Welding:

- 1) Unless otherwise noted, hangers, clips, and auxiliary support steel may be welded in lieu of bolting, clamping, or riveting to the building structural frame. Take adequate precautions during all welding operations for fire prevention and protecting walls and ceilings from smoke damage.

SECTION 23 05 29
HVAC SUPPORTS AND ANCHORS

2.3 FOUNDATIONS, BASES, AND SUPPORTS

A. Basic Requirements:

1. Furnish and install foundations, bases, and supports (not specifically indicated on the Drawings or in the Specifications of either the General Construction or Mechanical work as provided by another Contractor) for mechanical equipment.
2. All concrete foundations, bases and supports, shall be reinforced. All steel bases and supports shall receive a prime coat of zinc chromate or red metal primer. After completion of work, give steel supports a final coat of gray enamel.

B. Supports:

1. Provide sufficient clips, inserts, hangers, racks, rods, and auxiliary steel to securely support all suspended material, equipment and conduit without sag.
2. Hang heavy equipment from concrete floors or ceilings with Architect/Engineer-approved concrete inserts, furnished and installed by the Contractor whose work requires them, except where indicated otherwise.

C. Grout:

1. Grout shall be non-shrinking premixed (Master Builders Company "Embecco"), unless otherwise indicated on the drawings or approved by the Architect/Engineer.
2. Use Mix No. 1 for clearances of 1" or less, and Mix No. 2 for all larger clearances.
3. Grout under equipment bases, around pipes, at pipe sleeves, etc., and where shown on the drawings.

2.4 OPENINGS IN FLOORS, WALLS AND CEILINGS

- A. Exact locations of all openings for the installation of materials shall be determined by the Contractor and given to the General Contractor for installation or construction as the structure is built.
- B. Coordinate all openings with other Contractors.
- C. Hire the proper tradesman and furnish all labor, material and equipment to cut openings in or through existing structures, or openings in new structures that were not installed, or additional openings. Repair all spalling and damage to the satisfaction of the Architect/Engineer. Make saw cuts before breaking out concrete to ensure even and uniform opening edges.
- D. Said cutting shall be at the complete expense of each Contractor. Failure to coordinate openings with other Contractors shall not exempt the Contractor from providing openings at Contractor's expense.
- E. Do not cut structural members without written approval of the Architect or Structural Engineer.
- F. Exposed Housing Penetrations: Seal pipes with surface temperature below 150°F, penetrating housings with conical stepped, white silicone, EPDM or neoprene pipe flashings and stainless steel clamps equal to Portals Plus Pipe Boots or Pipetite.

2.5 ROOF PENETRATIONS

- A. Conical Pipe Boot: Seal pipes with surface temperature below 150°F penetrating single-ply roofs with conical stepped, UV-resistant silicone, EPDM or neoprene pipe flashings and stainless steel clamps equal to Portals Plus Pipe Boots or Pipetite. Color: White shall match roofing material.

SECTION 23 05 29
HVAC SUPPORTS AND ANCHORS

- B. Break insulation only at the clamp for pipes between 60°F and 150°F. Seal outdoor insulation edges watertight.

2.6 SLEEVES AND LINTELS

- A. Each Contractor shall provide sleeves and lintels for all duct and pipe openings required for the Contractor's work in masonry walls and floors, unless specifically shown as being by others.
- B. Fabricate all sleeves from standard weight black steel pipe or as indicated on the drawings. Provide continuous sleeve. Cut or split sleeves are not acceptable.
- C. Fabricate all lintels for masonry walls from structural steel shapes or as indicated on the drawings. Have all lintels approved by the Architect or Structural Engineer.
- D. Sleeves through the floors on exposed risers shall be flush with the ceiling, with planed squared ends extending 1" above the floor in unfinished areas, and flush with the floor in finished areas, to accept spring closing floor plates.
- E. Sleeves shall not penetrate structural members or masonry walls without approval from the Structural Engineer. Sleeves shall then comply with the Architect/Engineer's design.
- F. Openings through unexcavated floors and/or foundation walls below the floor shall have a smooth finish with sufficient annular space around material passing through opening so slight settling will not place stress on the material or building structure.
- G. Install all sleeves concentric with pipes. Secure sleeves in concrete to wood forms. This Contractor is responsible for sleeves dislodged or moved when pouring concrete.
- H. Where pipes rise through concrete floors that are on earthen grade, provide 3/4" resilient expansion joint material (e.g., foam, rubber, asphalt-coated fiber, bituminous-impregnated felt, or cork) wrapped around the pipe, the full depth of concrete, at the point of penetration. Secure to prevent shifting during concrete placement and finishing.
- I. Size sleeves large enough to allow expansion and contraction movement. Provide continuous insulation wrapping.
- J. Wall Seals ("Link-Seals"):
1. Where shown on the drawings, pipes passing through walls, ceilings, or floors shall have their annular space (sleeve or drilled hole - not tapered hole made with knockout plug) sealed by properly sized sealing elements consisting of a synthetic rubber material compounded to resist aging, ozone, sunlight, water and chemical action.
 2. Sleeves, if used, shall be standard weight steel with primed finish and waterstop/anchor continuously welded to sleeve. If piping carries only fluids below 120°F, sleeves may be thermoplastic with integral water seal and textured surface.
 3. Sleeves shall be at least 2 pipe sizes larger than the pipes.
 4. Pressure shall be maintained by stainless steel bolts and other parts. Pressure plates may be of composite material for Models S and OS.
 5. Sealing element shall be as follows:

Model	Service	Element Material	Temperature Range
S	Standard (Stainless)	EPDM	-40°F to 250°F
T	High/Low Temperature (Steam)	Silicone	-67°F to 400°F
T	Fire Seals (1 hour)	Silicone	-67°F to 400°F
FS	Fire Seals (3 hours)	Silicone	-67°F to 400°F
OS	Oil Resistant/Stainless	Nitrile	-40°F to 210°F

SECTION 23 05 29
HVAC SUPPORTS AND ANCHORS

6. Manufacturers:
- a. Thunderline Corporation "Link-Seals"
 - b. O-Z/Gedney Company
 - c. Calpico, Inc.
 - d. Innerlynx
 - e. Metraflex Company (cold service only)
 - f. Polywater PHSD

2.7 ESCUTCHEON PLATES AND TRIM

- A. Fit escutcheons to all insulated or uninsulated exposed pipes passing through walls, floors, or ceilings of finished rooms.
- B. Escutcheons shall be heavy gauge, cold rolled steel, copper coated under a chromium plated finish, heavy spring clip, rigid hinge and latch.
- C. Install galvanized steel (unless otherwise indicated) trim strip to cover vacant space and raw construction edges of all rectangular openings in finished rooms. This includes pipe openings.

2.8 PIPE PENETRATIONS

- A. Seal all pipe penetrations. Seal non-rated walls and floor penetrations with grout or caulk. Backing material may be used.
- B. Seal fire rated wall and floor penetrations with fire seal system as specified.

2.9 PIPE ANCHORS

- A. Provide all items needed to allow adequate expansion and contraction of all piping. All piping shall be supported, guided, aligned, and anchored as required.
- B. Repair all piping leaks and associated damage. Pipes shall not rub on any part of the building.

2.10 FINISH

- A. Prime coat exposed steel hangers and supports. Hangers and supports in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

PART 3 - EXECUTION

3.1 HVAC SUPPORTS AND ANCHORS

- A. General Installation Requirements:
 - 1. Install all items per manufacturer's instructions.
 - 2. Coordinate the location and method of support of piping systems with all installations under other Divisions and Sections of the Specifications.
 - 3. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
 - 4. Supports shall extend directly to building structure. Do not support piping from duct hangers unless coordinated with Sheet Metal Contractor prior to installation. Do not allow lighting or ceiling supports to be hung from piping supports.

SECTION 23 05 29
HVAC SUPPORTS AND ANCHORS

B. Supports Requirements:

1. Where building structural steel is fireproofed, all hangers, clamps, auxiliary steel, etc., which attach to it shall be installed prior to application of fireproofing. Repair all fireproofing damaged during pipe installation.
2. Set all concrete inserts in place before pouring concrete.
3. Furnish, install and prime all auxiliary structural steel for support of piping systems that are not shown on the Drawings as being by others.
4. Install hangers and supports complete with lock nuts, clamps, rods, bolts, couplings, swivels, inserts and required accessories.
5. Hangers for horizontal piping shall have adequate means of vertical adjustment for alignment.

C. Pipe Requirements:

1. Support all piping and equipment, including valves, strainers, traps and other specialties and accessories to avoid objectionable or excessive stress, deflection, swaying, sagging or vibration in the piping or building structure during erection, cleaning, testing and normal operation of the systems.
2. Do not, however, restrain piping to cause it to snake or buckle between supports or to prevent proper movement due to expansion and contraction.
3. Support piping at equipment and valves so they can be disconnected and removed without further supporting the piping.
4. Piping shall not introduce strains or distortion to connected equipment.
5. Parallel horizontal pipes may be supported on trapeze hangers made of structural shapes and hanger rods; otherwise, pipes shall be supported with individual hangers.
6. Trapeze hangers may be used where ducts interfere with normal pipe hanging.
7. Provide additional supports where pipe changes direction, adjacent to flanged valves and strainers, at equipment connections and heavy fittings.
8. Provide at least one hanger adjacent to each joint in grooved end steel pipe with mechanical couplings.

D. Provided the installation complies with all loading requirements of truss and joist manufacturers, the following practices are acceptable:

1. Loads of 100 lbs. or less may be attached anywhere along the top or bottom chords of trusses or joists with a minimum 3' spacing between loads.
2. Loads greater than 100 lbs. must be hung concentrically and may be hung from top or bottom chord, provided one of the following conditions is met:
 - a. The hanger is attached within 6" from a web/chord joint.
 - b. Additional L2x2x1/4 web reinforcement is installed per manufacturer's requirements.
3. It is prohibited to cantilever a load using an angle or other structural component that is attached to a truss or joist in such a fashion that a torsional force is applied to that structural member.
4. If conditions cannot be met, coordinate installation with truss or joist manufacturer and contact Architect/Engineer.

E. After piping and insulation installation are complete, cut hanger rods back at trapeze supports so they do not extend more than 3/4" below bottom face of lowest fastener and blunt any sharp edges.

SECTION 23 05 29
HVAC SUPPORTS AND ANCHORS

- F. Do not exceed 25 lbs. per hanger and a minimum spacing of 2'-0" on center when attaching to metal roof decking (limitation not required with concrete on metal deck). This 25 lbs. load and 2'-0" spacing include adjacent electrical and architectural items hanging from deck. If the hanger restrictions cannot be achieved, supplemental framing off steel framing will need to be added.
- G. Do not exceed the manufacturer's recommended maximum load for any hanger or support.
- H. Steel/Concrete Structure: Spacing of hangers shall not exceed the compressive strength of the insulation inserts, and in no case shall exceed the following:
 - 1. Steel(Std. Weight or Heavier - Liquid Service):
 - a. Maximum Spacing:
 - 1) 1-1/4" & under: 7'-0"
 - 2) 1-1/2": 9'-0"
 - 3) 2": 10'-0"
 - 4) 2-1/2": 11'-0"
 - 5) 3": 12'-0"
 - 6) 4" & larger: 12'-0"
 - 2. Steel (Std. Weight or Heavier - Vapor Service):
 - a. Maximum Spacing:
 - 1) 1-1/4" and under: 9'-0"
 - 2) 1-1/2": 12'-0"
 - 3) 2" & larger: 12'-0"
- I. Installation of hangers shall conform to MSS SP-58, 69, and 89.

END OF SECTION 230529

SECTION 23 05 53
HVAC IDENTIFICATION

SECTION 23 05 53 - HVAC IDENTIFICATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Identification of products installed under Division 23.

1.2 SUBMITTALS

- A. Submit shop drawings under provisions of Section 23 05 00. Include list of items identified, wording, letter sizes, and color coding.
- B. Include valve chart and schedule listing valve tag number, location, function, and valve manufacturer's name and model number.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. 3M
- B. Bunting
- C. Calpico
- D. Craftmark
- E. Emedco
- F. Kolbi Industries
- G. Seton
- H. W.H. Brady
- I. Marking Services.

2.2 MATERIALS

- A. General:
 - 1. Plastic Nameplates: Laminated three-layer phenolic with engraved black, 1/4" minimum letters on light contrasting background.
 - 2. Plastic Tags: Minimum 1-1/2" square or round laminated three-layer phenolic with engraved, 1/4" minimum black letters on light contrasting background.

SECTION 23 05 53
HVAC IDENTIFICATION

B. Pipe Markers:

1. All pipe markers (purchased or stenciled) shall conform to ANSI A13.1. Marker lengths and letter sizes shall be at least the following:

OD of Pipe or Insulation	Marker Length	Size of Letters
Up to and including 1-1/4"	8"	1/2"
1-1/2" to 2"	8"	3/4"
2-1/2" to 6"	12"	1-1/4"
8" to 10"	24"	2-1/2"
Over 10"	32"	3-1/2"

Plastic tags may be used for outside diameters under 3/4"

2. Plastic Pipe Markers: Semi-rigid plastic, preformed to fit around pipe or pipe covering; indicating flow direction and fluid conveyed.
3. Vinyl Pipe Markers: Colored vinyl with permanent pressure sensitive adhesive backing.
4. Underground Pipe Markers: Bright colored continuously printed plastic ribbon tape 6" wide by 3.5 mils thick, manufactured for direct burial, with aluminum foil core for location by non-ferrous metal detectors and bold lettering identifying buried item.
5. Tracer Wire:
 - a. Single copper conductors shall be solid or stranded annealed or hard uncoated copper per UL83 and ASTM requirements. Tracer tape or copper-coated steel wire is not acceptable.
 - b. Conductor shall be insulated with HMWPE as specified and applied in a concentric manner. The minimum at any point shall not be less than 90% of the specified average thickness in compliance with UL 83.
 - c. Tracer wire shall be continuously spark tested at 7500 Volts DC. Other electrical and mechanical tests shall be in accordance with UL 1581.

C. Ductwork Markers:

1. Ductwork systems shall be provided with preprinted, color-coded lettering indicating service, equipment serving, and arrow showing flow direction. Refer to Part 3 for installation information.
2. Self-Adhesive Vinyl Duct Labels: Colored vinyl with permanent Contact-type permanent pressure-sensitive adhesive backing suitable for indoor and outdoor application compatible with label and with substrate. Stencil painted markers are not permitted on ductwork systems.
3. Maximum Temperature: Able to withstand temperatures up to 160°F.
4. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 inch by 3/4 inch.
5. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and 1-1/2 inches high beyond 72 inches viewing distance. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
6. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions or as separate unit on each duct label to indicate flow direction.
7. Ductwork systems containing hazardous materials shall be provided with minimum 2" x 4" ANSI Z535.2 biohazard warning labels with custom labeling describing hazard. Refer to Part 3 for system and label description.

SECTION 23 05 53
HVAC IDENTIFICATION

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install all products per manufacturer's recommendations.
- B. Degrease and clean surfaces to receive adhesive for identification materials.
- C. Valves:
 - 1. All valves (except shutoff valves at equipment) shall have numbered tags.
 - 2. Provide or replace numbered tags on all existing valves that are connected to new systems or that have been revised.
 - 3. Provide all existing valves used to extend utilities to this project with numbered tags. Review tag numbering sequence with the Owner prior to ordering tags.
 - 4. Secure tags with heavy duty key chain and brass "S" link or with mechanically fastened plastic straps.
 - 5. Attach to handwheel or around valve stem.
 - 6. Number all tags and show the service of the pipe.
 - 7. Provide one Plexiglas framed valve directory listing all valves, with respective tag numbers, uses and locations. Mount directory in location chosen by the Architect/Engineer.
 - 8. Provide one 36" x 24" minimum Plexiglas framed piping schematic showing valve locations with respective tag numbers. Mount directory in location chosen by the Architect/Engineer.
 - 9. Provide two sets of laminated 8-1/2" x 11" (letter size) copies of a valve directory listing all valves, with respective tag numbers, uses, and locations. The directory shall be reviewed by the Owner and Architect/Engineer prior to laminating final copies. Laminated copies shall have brass eyelet in at least one corner for easy hanging.
- D. Pipe Markers:
 - 1. Adhesive Backed Markers: Use Brady Style 1, 2, or 3 on pipes 3" diameter and larger. Use Brady Style 4, 6, or 8 on pipes under 3" diameter. Similar styles by other listed manufacturers are acceptable. Secure all markers at both ends with a wrap of pressure sensitive tape completely around the pipe.
 - 2. Snap-on Markers: Use Seton "Setmark" on pipes up to 5-7/8" OD. Use Seton "Setmark" with nylon or Velcro ties for pipes 6" OD and over. Similar styles by other listed manufacturers are acceptable.
 - 3. Apply markers and arrows in the following locations where clearly visible:
 - a. At each valve.
 - b. On both sides of walls that pipes penetrate.
 - c. At least every 20 feet along all pipes.
 - d. On each riser and each leg of each "T" joint.
 - e. At least once in every room and each story traversed.
 - 4. Underground Pipe Markers: Install 8" to 10" below grade, directly above buried pipes.
- E. Ductwork Markers:
 - 1. Apply ductwork markers on ductwork systems containing hazardous materials in the following locations where clearly visible:
 - a. On both sides of walls that ducts penetrate.
 - b. At least every 20 feet along all ducts.

SECTION 23 05 53
HVAC IDENTIFICATION

- c. On each riser and each leg of each branch connection.
- d. At least once in every room and each story traversed.
- e. At all ductwork access doors.
- f. At all fans and equipment serving ductwork system. Markers shall be clearly visible from the normal maintenance access path to the equipment. Coordinate placement location with Owner.

F. Equipment:

- 1. All equipment not easily identifiable such as controls, relays, gauges, etc.; and all equipment in an area remote from its function such as air handling units, exhaust fans, filters, reheat coils, dampers, etc.; shall have nameplates or plastic tags listing name, function, and drawing symbol. Do not label exposed equipment in public areas.
- 2. Fasten nameplates or plastic tags with stainless steel self-tapping screws or permanently bonding cement.
- 3. Mechanical equipment that is not covered by the U.S. National Appliance Energy Conservation Act (NAECA) of 1987 shall carry a permanent label installed by the manufacturer stating that the equipment complies with the requirements of ASHRAE 90.1.

3.2 SCHEDULE

A. Pipes to be marked shall be labeled with text as follows, regardless of which method or material is used:

- 1. STEAM - 15 PSI: Black lettering; yellow background
- 2. STEAM - 5 PSI: Black lettering; yellow background
- 3. LOW PRESSURE CONDENSATE: Black lettering; yellow background

B. Steam pipe markers shall include operating steam pressure within pipes shown above.

C. Ductwork and Fan Systems: All fans, filters housings, and access doors shall be labeled with text as follows:

- 1. GENERAL EXHAUST AIR: Black lettering; yellow background

END OF SECTION 230553

SECTION 23 05 93
TESTING, ADJUSTING, AND BALANCING

SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Testing, adjusting, and balancing of air systems.
- B. Testing, adjusting, and balancing of heating systems.
- C. Measurement of final operating condition of HVAC systems.

1.2 QUALITY ASSURANCE

- A. Agency shall be a company specializing in the adjusting and balancing of systems specified in this section with minimum three years' experience. Perform work under supervision of AABC Certified Test and Balance Engineer, NEBB Certified Testing, Balancing and Adjusting Supervisor, SMARTA Certified Air and Hydronic Balancer, or TABB Certified Supervisor.
- B. Work shall be performed in accordance with the requirements of the references listed at the start of this section.

1.3 SUBMITTALS

- A. Submit copies of report forms, balancing procedures, and the name and qualifications of testing and balancing agency for approval within 30 days after award of Contract.
- B. Electronic Copies:
 - 1. Submit a certified copy of test reports to the Architect/Engineer for approval. Electronic copies shall be in PDF format only. Scanned copies, in PDF format, of paper originals are acceptable. Copies that are not legible will be returned to the Contractor for resubmittal. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.
 - 2. Electronic file size shall be limited to a maximum of 10MB. Larger files shall be divided into files that are clearly labeled as "1 of 2", "2 of 2", etc.
 - 3. All text shall be searchable.
 - 4. Bookmarks shall be used. All bookmark titles shall be an active link to the index page and index tabs.

1.4 REPORT FORMS

- A. Submit reports on AABC, SMACNA or NEBB forms. Use custom forms approved by the Architect/Engineer when needed to supply specified information.
- B. Include in the final report a schematic drawing showing each system component, including balancing devices, for each system. Each drawing shall be included with the test reports required for that system. The schematic drawings shall identify all testing points and cross-reference these points to the report forms and procedures.
- C. Refer to PART 4 for required reports.

SECTION 23 05 93
TESTING, ADJUSTING, AND BALANCING

1.5 WARRANTY/GUARANTEE

- A. The TAB Contractor shall include an extended warranty of 90 days after owner receipt of a completed balancing report, during which time the Owner may request a recheck of terminals, or resetting of any outlet, coil, or device listed in the test report. This warranty shall provide a minimum of 24 manhours of onsite service time. If it is determined that the new test results are not within the design criteria, the balancer shall rebalance the system according to design criteria.
- B. Warranty/Guarantee must meet one of the following programs: TABB International Quality Assurance Program, AABC National Project Performance Guarantee, NEBB's Conformance Certification.

1.6 SCHEDULING

- A. Coordinate schedule with other trades. Provide a minimum of seven days' notice to all trades and the Architect/Engineer prior to performing each test.
- B. Project will be constructed in phases. Provide balancing report after each phase is complete.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. All procedures must conform to a published standard listed in the References article of this section. All equipment shall be adjusted in accordance with the manufacturer's recommendations. Any system not listed in this specification but installed under the contract documents shall be balanced using a procedure from a published standard listed in the References article.
- B. The Balancing Contractor shall incorporate all pertinent documented construction changes (e.g. submittals/shop drawings, change orders, RFIs, ASIs, etc.) and include in the balancing report.
- C. Recorded data shall represent actual measured or observed conditions.
- D. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing is complete, close probe holes and patch insulation with new materials as specified. Restore vapor barrier and finish as specified.
- E. Permanently mark setting of valves, dampers, and other adjustment devices allowing for settings to be restored. Set and lock memory stops.
- F. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, plugging test holes, and restoring thermostats to specified settings.
- G. The Balancing Contractor shall measure terminal air box air flow, and the TCC shall adjust DDC readout to match. Refer to Section 23 09 00 for additional information.
- H. Installations with systems consisting of multiple components shall be balanced with all system components operating.

SECTION 23 05 93
TESTING, ADJUSTING, AND BALANCING

3.2 EXAMINATION

A. Before beginning work, verify that systems are complete and operable. Ensure the following:

1. General Equipment Requirements:

- a. Equipment is safe to operate and in normal condition.
- b. Equipment with moving parts is properly lubricated.
- c. Temperature control systems are complete and operable.
- d. Proper thermal overload protection is in place for electrical equipment.
- e. Direction of rotation of all fans and pumps is correct.
- f. Access doors are closed and end caps are in place.

2. Duct System Requirements:

- a. All filters are clean and in place. If required, install temporary media.
- b. Duct systems are clean and free of debris.
- c. Fire/smoke and manual volume dampers are in place, functional and open.
- d. Air outlets are installed and connected.
- e. Duct system leakage has been minimized.

3. Pipe System Requirements:

- a. Coil fins have been cleaned and combed.
- b. Hydronic systems have been cleaned, filled, and vented.
- c. Strainer screens are clean and in place.
- d. Shutoff, throttling and balancing valves are open.

B. Report any defects or deficiencies to Architect/Engineer.

C. Promptly report items that are abnormal or prevent proper balancing.

D. If, for design reasons, system cannot be properly balanced, report as soon as observed.

E. Beginning of work means acceptance of existing conditions.

3.3 PREPARATION

A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to the Architect/Engineer for spot checks during testing.

B. Instruments shall be calibrated within six months of testing performed for project, or more recently if recommended by the instrument manufacturer.

3.4 INSTALLATION TOLERANCES

A. $\pm 10\%$ of scheduled values:

- 1. Adjust air inlets and outlets to $\pm 10\%$ of scheduled values.
- 2. Adjust piping systems to $\pm 10\%$ of design values.

B. Adjust exhaust air-handling systems to $+10\%$ / -5% of scheduled values.

SECTION 23 05 93
TESTING, ADJUSTING, AND BALANCING

3.5 ADJUSTING

- A. After adjustment, take measurements to verify balance has not been disrupted or that disruption has been rectified.
- B. Once balancing of systems is complete, at least one damper or valve must be 100% open.
- C. After testing, adjusting and balancing are complete, operate each system and randomly check measurements to verify system is operating as reported in the report. Document any discrepancies.

3.6 SUBMISSION OF REPORTS

- A. Fill in test results on appropriate forms.

PART 4 - SYSTEMS TO BE TESTED, ADJUSTED AND BALANCED

4.1 GENERAL REQUIREMENTS

- A. Title Page:
 - 1. Project name.
 - 2. Project location.
 - 3. Project Architect.
 - 4. Project Engineer (IMEG Corp.).
 - 5. Project General Contractor.
 - 6. TAB Company name, address, phone number.
 - 7. TAB Supervisor's name and certification number.
 - 8. TAB Supervisor's signature and date.
 - 9. Report date.
- B. Report Index
- C. General Information:
 - 1. Test conditions.
 - 2. Nomenclature used throughout report.
 - 3. Notable system characteristics/discrepancies from design.
 - 4. Test standards followed.
 - 5. Any deficiencies noted.
 - 6. Quality assurance statement.
- D. Instrument List:
 - 1. Instrument.
 - 2. Manufacturer, model, and serial number.
 - 3. Range.
 - 4. Calibration date.

4.2 AIR SYSTEMS

- A. Fan Data:
 - 1. Drawing symbol.
 - 2. Location.

SECTION 23 05 93
TESTING, ADJUSTING, AND BALANCING

3. Manufacturer and model.
4. Flow rate (cfm): specified and actual.
5. Total static pressure: specified and actual. (Indicate measurement locations).
6. Inlet pressure.
7. Discharge pressure.
8. Fan RPM.

B. Air Terminal (Inlet or Outlet):

1. Drawing symbol.
2. Room number/location.
3. Terminal type and size.
4. Velocity: specified and actual.
5. Flow rate (cfm): specified and actual.
6. Percent of design flow rate.

4.3 HEATING SYSTEMS

A. Terminal Heat Transfer Units:

1. General Requirement:
 - a. Drawing symbol.
 - b. Location.
 - c. Manufacturer and model.
 - d. Include air data only for forced air units.
2. Flow Rate:
 - a. Flow rate (cfm): specified and actual.
 - b. Water flow rate (cfm): specified and actual.
3. Temperature:
 - a. Entering air temperature: specified and actual.
 - b. Leaving air temperature: specified and actual.
 - c. Entering water temperature: specified and actual.
 - d. Leaving water temperature: specified and actual.
4. Energy:
 - a. Air Btuh (cfm x temperature rise x 1.09).
 - b. Water Btuh (gpm x temperature drop x 500). Repeat tests if not within 10% of air Btuh.

END OF SECTION 230593

SECTION 23 07 19
HVAC PIPING INSULATION

SECTION 23 07 19 - HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Piping Insulation.
- B. Insulation Jackets.

1.2 QUALITY ASSURANCE

- A. Applicator: Company specializing in piping insulation application with five years minimum experience.
- B. Materials: Listed and labeled for flame spread/smoke developed rating of no more than 25/50 when tested per ASTM E84 or UL 723 as required by code. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers with appropriate markings of applicable testing agency.
- C. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- D. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

1.3 SUBMITTALS

- A. Submit shop drawings per Section 23 05 00. Include product description, list of materials and thickness for each service, and locations.

PART 2 - PRODUCTS

2.1 INSULATION

- A. Type C: Molded rigid cellular glass; ANSI/ASTM C-552; 0.29 maximum 'K' value at 75°F; density 7.3lb/ft; minimum compressive strength 90 psi parallel to rise; moisture resistant, non-combustible; suitable for -100°F to +900°F. For below grade installations use asphaltic mastic paper vapor barrier jacket. Use self-seal all-purpose polymer or polypropylene service jacket for above grade installations.
- B. Type H: Semi-Rigid Mineral Wool Fiberboard; ANSI/ASTM C612; 0.30 maximum 'K' value at 200°F. Suitable to 1200°F.

2.2 VAPOR BARRIER JACKETS

- A. All-purpose polymer or polypropylene service jacket vapor barrier with self-sealing adhesive joints. Beach puncture resistance ratio of at least 50 units. Tensile strength: 35 psi minimum. Single, self-seal acrylic adhesive on longitudinal jacket laps and butt strips.

SECTION 23 07 19
HVAC PIPING INSULATION

- B. Polyvinylidene Chloride (PVDC or Saran) film and tape: Durable and highly moisture and moisture vapor resistant. Please refer to manufacturer's recommended installation guidelines.

2.3 JACKET COVERINGS

- A. Plastic Jackets and Fitting Covers: High impact, glossy white, 0.030" thick, self-extinguishing plastic. Suitable for use indoors or outdoors with ultraviolet inhibitors. Suitable for -40°F to 150°F. Listed and labeled at no more than 25/50 when tested per ASTM E84 or UL 723 as required by code.

2.4 REMOVABLE INSULATION JACKETS

- A. Removable insulation jackets shall consist of outer covering, interstitial insulation material, and inner covering.
- B. Inner and outer covering shall be constructed from a minimum 16.5 oz./yd² PTFE fiberglass composite and suitable for insulating surface temperatures up to 550°F.
- C. Interstitial insulation blanket shall be minimum 1-1/2" thick and shall consist of either:
 - 1. Silica and glass-fiber insulation felts and blankets - minimum 6 lb./ft³ density.
 - 2. E-type glass-fiber felts and blankets - minimum 6 lb./ft³ density.
- D. Construction: Inner and outer covering with interstitial insulation material shall be joined into a single assembly using a double sewn lock stitch with 4-6 stitches/inch. The thread used shall be able to withstand minimum 550°F surface temperatures without degradation. The use of hog rings, staples, and wires for closure of assembly are not acceptable. The interstitial insulation shall be sewn as an integral part of the inner and outer coverings to prevent shifting of the insulation. Insulation pins are not an allowable method of preventing the insulation from shifting and shall not be used.
- E. No raw cut jacket edges shall be exposed.
- F. Jackets shall be fastened to equipment and piping components using hook and loop (Velcro) straps and minimum 1" slide buckles.
- G. Jacket coverings shall have an inner covering edge with a continuous strip of hook & loop closure (Velcro) that is parallel to the seam and overlaps the outer covering by a minimum of 2 inches.
- H. Manufacturers:
 - 1. Firwin Corp
 - 2. Lewco Specialty Products
 - 3. ThermaXX Jackets LLC
 - 4. Approved equivalent

PART 3 - EXECUTION

3.1 PREPARATION

- A. Install insulation after piping has been tested. Pipe shall be clean, dry and free of rust before applying insulation.
- B. Patch and repair torn insulation. Paint to match adjacent insulation surface.

SECTION 23 07 19 HVAC PIPING INSULATION

3.2 INSTALLATION

A. General Installation Requirements:

1. Install materials per manufacturer's instructions, building codes and industry standards.
2. Continue insulation with vapor barrier through penetrations. This applies to all insulated piping. Maintain fire rating of all penetrations.
3. All piping and insulation that does not meet 25/50 that is in an air plenum shall have written approval from the Authority Having Jurisdiction and the local fire department for authorization and materials approval. If approval has been allowed, the non-rated material shall be wrapped with a product that has been listed and labeled having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested as a composite in accordance with ASTM E84 or UL 723.
4. On 1" and smaller piping routed through metal wall studs, provide a plastic grommet to protect the piping. The piping shall be insulated between the wall studs, and the insulation shall butt up to each stud.

B. Insulated Piping Operating Above 140°F:

1. Insulate fittings, valves, flanges, float & thermostatic steam traps, and strainers. On gate valves, the insulation shall be extended to cover the entire valve bonnet, leaving only the portion of the stem that is above the bonnet and valve operator exposed.
2. All balance valves with fluid operating above 140°F shall be insulated and an opening shall be left in the insulation to allow for reading and adjusting the valve.
3. The use of removable insulation jackets is acceptable for insulating large and non-cylindrical shaped piping components (e.g., check valves, pressure regulating valves, calibrated balance valves, gate valve bonnets, F&T traps, strainers, line sets, and the like).

C. Exposed Piping:

1. Locate and cover seams in least visible locations.
2. Where exposed insulated piping extends above the floor, provide a sheet metal guard around the insulation extending 12" above the floor. Guard shall be 0.016" cylindrical smooth or stucco aluminum and shall fit tightly to the insulation.

3.3 SUPPORT PROTECTION

A. Provide a shield on all insulated piping at each support between the insulation jacket and the support.

B. On all insulated piping greater than 1-1/2", provide shield with insulation insert of same thickness and contour as adjoining insulation at each support, between the pipe and insulation jacket, to prevent insulation from sagging and crushing. Inserts shall be as follows:

1. The insert shall be suitable for planned temperatures, be suitable for use with specific pipe material, and shall be a minimum 180° cylindrical segment the same length as metal shields. Inserts shall be:
 2.
 - a. Cellular glass (Type C) (for all temperature ranges) with a minimum compressive strength of 90 psi is acceptable for pipe sizes 14" and below. For pipe sizes larger than 14, provide rolled steel plate in addition to the shield.

SECTION 23 07 19
HVAC PIPING INSULATION

- b. As an alternative to separate pipe insulation insert and saddle, properly sized manufactured integral rigid insulation insert and shield assemblies may be used.
 - 1) Products:
 - a) Buckaroo CoolDry
 - b) Cooper/B-Line Fig. B3380 through B3384
 - c) Pipe Shields A1000, A2000
 - c. Insulation Couplings:
 - 1) Molded thermoplastic slip coupling, -65°F to 275°F, sizes up to 4-1/8" OD, and receive insulation thickness up to 1". Suitable for use indoors or outdoors with UV stabilizers. Vertical insulation riser clamps shall have a 1,000lb vertical load rating. On cold pipes operating below 60°F, cover joint and coupling with vapor barrier mastic to ensure continuous vapor barrier.
 - 2) PET thermoplastic foam load bearing core with elastomeric foam ends and lap-seal jacket.
 - 3) Horizontal Strut Mounted Insulated Pipe Manufacturers:
 - a) Klo-Shure or equal
 - b) Armafix Ecolight
 - 4) Vertical Manufacturers:
 - a) Manufacturers: Klo-Shure Titan or equal
 - d. Rectangular blocks, plugs, or wood material are not acceptable.
 - e. Temporary wood blocking may be used by the Piping Contractor for proper height; however, these must be removed and replaced with proper inserts by the Insulation Contractor. Refer to Supports and Anchors specification section for additional information.
- C. Neatly finish insulation at supports, protrusions, and interruptions.
- D. Install metal shields between all hangers or supports and the pipe insulation. Shields shall be galvanized sheet metal, half-round with flared edges. Adhere shields to insulation. On cold piping, seal the shields vapor-tight to the insulation as required to maintain the vapor barrier, or add separate vapor barrier jacket.
- E. Shields shall be at least the following lengths and gauges:

Pipe Size	Shield Size
1/2" to 3-1/2"	12" long x 18 gauge
4"	12" long x 16 gauge
5" to 6"	18" long x 16 gauge
8" to 14"	24" long x 14 gauge
16" to 24"	24" long x 12 gauge
- F. Elastomeric foam insulation shields/saddle; molded thermoplastic rigid pipe saddle sized for insulation outside diameter. Length as indicated above.
- G. Ferrous hot piping 4 inches and larger, provide steel saddle at rollers as described in Section 23 05 29 "HVAC Supports and Anchors".

SECTION 23 07 19 HVAC PIPING INSULATION

- H. Minimum 1/4" rolled galvanized steel plates shall be provided in addition to the sleeves as reinforcement on large pipes to reduce point loading on roller, trapeze hanger and strut support locations depending on insulation compressive strength. Refer to section above for exact locations.

3.4 INSULATION

A. Type C Insulation:

1. Seal all longitudinal joints with manufacturer approved adhesive. Secure butt joint strips in a similar manner.
2. Insulate fittings with prefabricated fittings.

B. Type H Insulation:

1. Apply with edges tightly butted, joints broken.
2. Secure with 16 gauge galvanized, annealed steel wire or 1/2" x 0.015" galvanized steel bands, 12" maximum centers.
3. Install welding studs, clips and angles where required to anchor wires and bands.

3.5 JACKET COVER INSTALLATION

A. Plastic Covering:

1. Provide vapor barrier as specified for insulation type. Cover with plastic jacket covering. Position seams to shed water.
2. Solvent weld all joints with manufacturer recommended cement.
3. Overlap all laps and butt joints 1-1/2" minimum. Repair any loose ends that do not seal securely. Solvent weld all fitting covers in the same manner. Final installation shall be watertight.
4. All joints in areas noted shall meet USDA standards for Totally Sealed Systems, including overlaps of 1" on circumferential and 1.5" to 2" on longitudinal seams.
5. Use plastic insulation covering on all exposed pipes including, but not limited to:
 - a. All exposed piping in finished spaces unless noted otherwise on the drawings.
 - b. All exposed piping in locker rooms.
 - c. All exposed piping in unfinished areas as noted on drawings (e.g., storage rooms, janitor's closets, utility rooms, etc.).
 - d. All exposed piping in mechanical or equipment rooms below 8'-0" above floor.
 - e. All exposed piping in mechanical rooms that is subject to damage from normal operations. (Example: Piping that must be stepped over routinely.)
 - f. All exposed piping in tunnels designated as passageways, equipment access, or egress.

3.6 SCHEDULE

- A. Refer to drawings for insulation schedule.

END OF SECTION 230719

SECTION 23 22 00
STEAM AND STEAM CONDENSATE PIPING

SECTION 23 22 00 - STEAM AND STEAM CONDENSATE PIPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Pipe and Pipe Fittings.
- B. Valves.
- C. Steam Piping System.
- D. Condensate Piping System.

1.2 QUALITY ASSURANCE

- A. Valves: Manufacturer's name and pressure rating marked on valve body. Remanufactured valves are not acceptable.
- B. Welding Materials and Procedures: Conform to ANSI/ASME SEC 9.

1.3 SUBMITTALS

- A. Submit product data under provisions of Section 23 05 00. Include data on pipe fittings, valves and accessories.
- B. Include certification of compliance with ANSI/AWS D1.1 for all welders.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store and protect piping to prevent corrosion and entrance of foreign matter.
- B. Deliver and store valves in shipping containers with labeling in place.

1.5 REGULATORY REQUIREMENTS

- A. Conform to ANSI/ASME B31.9 for the following pipe systems:
 - 1. Boiler external pipe systems that operate up to 15 psi.
 - 2. Non-boiler external pipe systems that operate up to 150 psi.
- B. Conform to ANSI/ASME B31.1 for boiler external pipe systems that operate above 15 psi.
- C. Refer to ANSI/ASME B31.1 and ANSI/ASME B31.9 for "boiler external piping" and "non-boiler external piping" definitions.

1.6 COORDINATION DRAWINGS

- A. Reference Coordination Drawings article in Section 23 05 00 for required steam and steam condensate piping systems electronic CAD drawings to be provided to Coordinating Contractor for inclusion into composite coordination drawings.

SECTION 23 22 00
STEAM AND STEAM CONDENSATE PIPING

PART 2 - PRODUCTS

2.1 STEEL PIPING (0 TO 125 PSIG)

A. Steel Pipe; 0 to 125psig; Standard Weight; Threaded Joints:

1. Design Pressure: 125 psig. Maximum Design Temperature: 353°F.
2. Pipe: Standard weight black steel, threaded and coupled, ASTM A53.
3. Joints: Screwed.
4. Fittings: 125 psi S - 175 psi. WOG, cast iron, ASTM A126, ANSI B16.4.
5. Unions: 250 psi S - 500 psi. WOG, black malleable iron, ground joint with brass seat.

B. Steel Pipe; 0 to 125psig; Extra Strong; Threaded Joints:

1. Design Pressure: 125 psig. Maximum Design Temperature: 353°F.
2. Pipe: Extra strong black steel, threaded and coupled, ASTM A53.
3. Joints: Screwed.
4. Fittings: 125 psi S - 175 psi WOG, cast iron, ASTM A126, ANSI B16.4.
5. Unions: 250 psi S - 500 psi WOG, black malleable iron, ground joint with brass seat.

2.2 COPPER PIPING (0 to 125 psig)

A. Copper Pipe; 0 to 125 psig; Type K; Solder Joint:

1. Design Pressure: 125 psig. Maximum Design Temperature: 353°F.
2. Tubing: Type K drawn temper seamless copper tube, ASTM B88.
3. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver, with melting range 430°F to 535°F. Braze, AWS A5.8, BCuP silver/phosphorus/copper alloy with melting range 1190°F to 1480°F.
4. Fittings: Cast Brass, ASME 16.18 or wrought copper solder joint, ASME B16.22.

2.3 VALVES

A. Boiler/Shutoff Valves:

1. Gate Valves:

- a. GA-1 (0 to 125 psig): 2" and under, 125 psi S @ 353°F, 300 psi WOG @ 150°F, screwed, bronze, rising stem, screwed bonnet. Crane #431, Hammond #IB641, Stockham #B122, Walworth #56, Milwaukee #1150, Watts #B-3210, NIBCO #T-131, Jomar T-351G.
- b. GA-8 (126 to 250 psig): 2" and under, 800# steam, socket weld, forged steel, OS&Y, bolted bonnet. Vogt Valves SW11103.

B. Shutoff Valves:

1. BA-1: 3" and under, 125 psi saturated steam, 600 psi WOG, full port, screwed or solder ends (acceptable only if rated for soldering in line with 470°F melting point of lead-free solder), bronze body of a copper alloy containing less than 15% zinc, stainless steel ball and trim, Teflon seats and seals.
 - a. Body: Bronze
 - 1) Manufacturers: Apollo #77C-140, Stockham #S-206 BR1-R, Milwaukee #BA-400, Watts, Nibco #585-70-66, National Utilities Co., RUB, Jomar T/S-200CSS.

SECTION 23 22 00
STEAM AND STEAM CONDENSATE PIPING

- b. Body: Dezincification resistant brass alloy, lead free. Jomar T/S-100SSS.
 - 2. BA-1A (0 to 125 psig): 2-1/2" and 3", 150 psi saturated steam, 275 psi WOG ANSI Class, 150 psi standard port, carbon steel body stainless steel ball and trim, Teflon seats and seals. Apollo #88A-100, Nibco #F510-CS/66, Milwaukee #F90.
- C. Throttling/Shutoff Valves:
- 1. Globe Valves (0 to 125 psig):
 - a. GL-1 (0 to 125 psig): 2" and under, 125 psi saturated steam, 300 psi WOG, screwed, bronze. Crane #7TF, Stockham #B22T, Walworth #3095, Milwaukee #590, Hammond #IB413, Watts #B-4010-T, NIBCO T-235-Y.
 - b. GL-2 (0 to 125 psig): 2-1/2" thru 10", 125 psi S @ 353°F, 200 psi WOG @ 150°F, flanged, iron body, bronze mounted. Crane #351, Hammond #IR116, Stockham #G-512, Walworth #8906F, Milwaukee #F2981, Watts #F-501, NIBCO F-718-B.
- 2.4 CHECK VALVES
- A. CK-1 (0 to 125 psig): 2" and under, 125 psi S @ 353°F, 200 psi WOG @ 150°F, screwed, bronze, horizontal swing. Crane #37, Hammond #IB904, Stockham #B319, Walworth #3406, Milwaukee #509, NIBCO T-413-Y, Jomar T-511G.
 - B. CK-9 (126 to 250 psig): 2" and under, Class 800, socket weld, forged steel, lift type with bolted cover. Crane FB-3675XU-W, JME 24834SC.
- 2.5 STRAINERS
- A. ST-1 (0 to 125 psig): Cast iron body, screwed ends, screwed cover, 250# steam @ 406°F, 400# WOG @ 150°F. Armstrong #CA1SC, Metraflex #TS, Mueller Steam Specialty Co. #11M, Sarco #IT, Watts #77S, NIBCO T-751. Bronze body strainer 125# may be used as contractor option.
 - B. ST-2 (0 to 125 psig): Cast iron body, 125 lb. flanged ends, bolted cover, 125 psi S @ 353°F, 175 psi WOG @ 150°F. Armstrong #A1FL, Metraflex #TF, Mueller Steam Specialty Co. #758, Sarco #CI-125, Watts #77F, NIBCO F-721.
 - C. ST-5 (126 to 250 psig): Cast steel body, socket weld ends, screwed cover, 600# steam @ 850°F, 1440# WOG @ 150°F. Armstrong #B1SW, Mueller Steam Specialty Co. #862, Sarco #CT.
 - D. ST-6 (126 to 250 psig): Cast steel body, 300# flanged ends, bolted cover, 300# steam, 720# WOG. Armstrong #B1FL, Mueller Steam Specialty Co. #762, Sarco #1738.
 - E. Unless otherwise indicated, strainers shall have stainless steel screens with perforations as follows:
 - 1. Steam All Sizes: 1/32"
 - 2. Condensate All Sizes: 3/64"
 - F. Furnish pipe nipple with gate valve and threaded cap to blow down all strainer screens.

SECTION 23 22 00
STEAM AND STEAM CONDENSATE PIPING

PART 3 - EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends, remove burrs, bevel plain end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Remove all scale, rust, dirt, oils, stickers and thoroughly clean exterior of all bare metal exposed piping, hangers, and accessories in preparation to be painted.
- D. Make connections to equipment with flanges or unions.
- E. After completion, fill, clean, and treat systems.

3.2 PIPING SCHEDULE

- A. Steam (0 to 125 psig):
 - 1. Steel Pipe; 0 to 125 psig; Standard Weight; Threaded Joints: 2" and Under
 - 2. Shutoff Valves: GA-1, GA-2, BA-1, BA-1A
 - 3. Throttling: GL-1, GL-2
 - 4. Check Valves: CK-1, CK-6
 - 5. Strainers: ST-1, ST-2
- B. Condensate Piping (0 to 125 psig):
 - 1. Steel Pipe; 0 to 125 psig; Extra Strong; Threaded Joints: 2" and Under
 - 2. Copper Pipe; 0 to 125 psig; Solder Joint: 2" and Under
 - 3. Shutoff Valves: GA-1, GA-2, BA-1, BA-1A
 - 4. Throttling: GL-1, GL-2
 - 5. Check Valves: CK-1, CK-6
 - 6. Strainers: ST-1, ST-2

3.3 TESTING PIPING

- A. Complete all testing of pipes underground, or in chases and walls, before piping is concealed.
- B. Complete all testing before insulation is applied, or if insulation is applied before the pipe is tested and a leak develops which ruins the insulation, the pipe installing contractor shall arrange and pay for replacing the damaged insulation.
- C. Test piping with water at 150% of the maximum operating pressure.
- D. Hold pressure for at least two hours.
- E. Test to be witnessed by the Architect/Engineer or their representative, if requested by the Architect/Engineer.

SECTION 23 22 00
STEAM AND STEAM CONDENSATE PIPING

3.4 CLEANING PIPING

A. Assembly:

1. Prior to assembly of pipe and piping components, all loose dirt, scale, oil and other foreign matter on internal or external surfaces shall be removed by means consistent with good piping practice subject to the approval of the Architect/Engineer's representative. Chips and burrs from machinery or thread cutting operation shall be blown out of pipe before assembly. Cutting oil shall be wiped from internal and external surfaces.
2. During fabrication and assembly, remove slag and weld spatter from both internal and external pipe joints by peening, chipping and wire brushing.
3. Notify the Architect/Engineer's representative prior to starting any post erection cleaning operation in sufficient time to allow witnessing the operation. Consult with and obtain approval from the Architect/Engineer's representative regarding specific procedures and scheduling. Arrange for proper disposal of cleaning and flushing fluids.
4. When the system is started up for the first time, discharge the condensate to drain per the boiler manufacturer's recommendations or for 24 hours, whichever is more restrictive. Add domestic cold water to the drain at a sufficient rate to reduce the condensate temperature to a maximum of 140°F.

3.5 INSTALLATION

A. General Installation Requirements:

1. Route piping in orderly manner, plumb and parallel to building structure, and maintain gradient.
2. Install piping to conserve building space and not interfere with use of space, other work, or equipment.
3. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
4. Slope steam piping 0.25" in 10 feet in direction of flow. Use eccentric reducers to maintain bottom of pipe level.
5. Slope steam condensate piping 0.5" in 10 feet.
6. Where pipe supports are welded to structural building framing, scrape, brush clean, and apply zinc rich primer to welds.

B. Installation Requirements in Electrical Rooms:

1. Do not install piping or other equipment above electrical switchboards or panelboards. This includes a dedicated space extending 25 feet from the floor to the structural ceiling with width and depth equal to the equipment.

C. Valves/Fittings and Accessories:

1. Provide clearance for installation of insulation and access to valves and fittings.
2. Provide access doors where valves and fittings are not exposed.
3. Provide drip trap assembly at low points and before control valves and pressure reducing valves.
4. Provide loop vents over trapped sections.
5. Prepare pipe, fittings, supports, and accessories for finish painting.
6. Provide drip legs as shown on the drawings, at low points, traps, and the base of all risers in steam, and condensate pipes. Unless otherwise shown, drip legs shall be full pipe size on pipes through 4" and at least 4", but not less than half line size over 4". Drip legs shall be 12" minimum length, with a reducer and a 3/4" shutoff valve.
7. Install valves with stems upright or horizontal, not inverted.
8. Provide shutoff valves in supply and return to all equipment.

SECTION 23 22 00
STEAM AND STEAM CONDENSATE PIPING

9. Install strainers in steam piping with the "wye" of the strainer to the side of the pipe in the horizontal plane to avoid pooling of condensate.

3.6 PIPE ERECTION AND LAYING

- A. Carefully inspect all pipe, fittings, valves, equipment and accessories before installation. Any items that are unsuitable, cracked or otherwise defective shall be rejected and removed from the job immediately.
- B. All pipe, fittings, valves, equipment and accessories shall have factory applied identification sufficient to determine conformance with specified requirements.
- C. Exercise care at every stage of storage, handling, laying and erecting to prevent entry of foreign matter into piping, fittings, valves, equipment and accessories. Do not erect or install any item that is not clean.
- D. During construction, until system is fully operational, keep all openings in piping and equipment closed except when actual work is being performed on that item of system. Use plugs, caps, blind flanges or other items designed for this purpose.
- E. Run pipe straight and true, parallel to building lines with minimum use of offsets and couplings. Provide only offsets required for needed headroom or clearance and to provide needed flexibility in piping.
- F. Change direction of pipes only with fittings or pipe bends. Change size only with fittings. Do not use miter fittings, face or flush bushings, or street elbows. All fittings shall be long radius type, unless otherwise noted.
- G. Provide flanges or unions at all connections to equipment traps and valves to facilitate dismantling.
- H. Arrange piping and connections so equipment served may be serviced or totally removed without disturbing piping beyond final connections and associated shutoff valves.
- I. Use full and double lengths of pipe wherever possible.
- J. Unless otherwise indicated, install all inlet and outlet piping, including shutoff valves and strainers, to coils, pumps and other equipment at line size with reduction in size made only at control valve, pump, or trap.
- K. Cut all pipe to exact measurement and install without springing or forcing.
- L. Avoid creating, even temporarily, undue loads, forces or strains on valves, equipment or building elements with piping connections or supports.
- M. Unless otherwise indicated, branch takeoffs shall be from top of mains or headers at either a 45° or 90° angle from the horizontal plane for steam pipes.
- N. Branch takeoffs shall be from the top, side (if branch is two sizes smaller than main), or any angle from the horizontal plane to the top of piping for liquids.

3.7 BRANCH CONNECTIONS

- A. Make branch connections with standard tee or cross fittings of the type required for the service unless otherwise indicated.

SECTION 23 22 00
STEAM AND STEAM CONDENSATE PIPING

- B. Reducers are generally not shown. Where pipe sizes change at tee, the tee shall be the size of the largest pipe shown connecting to it.
 - C. Branch connections from mains may be cut into black steel pipe using forged weld-on fittings:
 - 1. Steam.
 - 2. Condensate.
 - 3. Boiler Feedwater.
 - D. Use of forged weld-on fittings is further limited as follows:
 - 1. Must have at least same pressure rating as the main.
 - 2. Header or main must be 2-1/2" or over.
 - 3. Branch pipe is at least two sizes under main size.
- 3.8 JOINING OF PIPE
- A. Threaded Joints (Steel Pipe):
 - 1. Screw threads shall conform to ANSI B2.1 "Pipe Threads".
 - 2. Ream pipe ends and remove all burrs and chips formed in cutting and threading.
 - 3. Protect plated pipe and valve bodies from wrench marks.
 - 4. Apply high temperature, anti-seize thread lubricant to male threads.
 - B. Flanged Joints (Steel Pipe):
 - 1. Steel flanges shall conform to ANSI B16.5 "Steel Pipe Flanges and Flanged Fittings". Cast iron flanges shall conform to ANSI B16.1 "Cast Iron Flanged and Flanged Fittings". Steel flanges shall be raised face except when bolted to flat face cast iron flange.
 - 2. Bolting for services up to 399°F shall be ASTM A307, Grade B bolts and heavy hexagonal nuts. Bolting for services from 400°F to 790°F shall be ASTM A193, Grade B-7 with Grade 24 hexagonal nuts. Bolts and nuts shall conform to ANSI B18.2.1 "Square and Hex Bolts" or B18.2.2 "Square and Hex Nuts".
 - 3. Set flange bolts beyond finger tightness with an indicating torque wrench to insure equal tension in all bolts. Tighten bolts so those directly opposite are torqued in sequence.
 - 4. Gaskets for flat face flanges shall be full face type. Gaskets for raised faced flanges shall conform to requirements for "Group I Gaskets" in ANSI B16.5. Unless otherwise specified gaskets shall meet the following requirements:
 - a. Gasket material and thickness approved by manufacturer for intended service, chemical compatibility, pipe system test pressure, and operating temperature range.
 - b. Gaskets used in piping systems for saturated steam service shall be approved by manufacturer for use in saturated steam applications up to and including 150 psig.
 - c. Gaskets used for superheated steam applications and for saturated steam systems with operating pressures greater than 150 psig saturated steam shall be of the spiral wound "chevron" metallic type with flexible graphite filler by the following manufacturers:
 - 1) Flexitallic (LS Style CG)
 - 2) TEADIT (Style 913)
 - 3) Garlock (Flexseal Style RW)
 - 4) Lamons (SpiraSeal Style WR)
 - 5) Leader (Style LG-13)

SECTION 23 22 00
STEAM AND STEAM CONDENSATE PIPING

- d. Gaskets used for steam condensate service including, but not limited to, condensate return, boiler feedwater, and condensate transfer piping systems shall meet the following requirements:
 - 1) Maximum pressure rating of at least 2,000 psig.
 - 2) Maximum continuous temperature rating of at least 650°F.

END OF SECTION 232200

SECTION 23 22 18
STEAM AND STEAM CONDENSATE SPECIALTIES

SECTION 23 22 18 - STEAM AND STEAM CONDENSATE SPECIALTIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Steam Traps
- B. Safety Valves
- C. Trip Stop Valve
- D. Vacuum Breakers

1.2 QUALITY ASSURANCE

- A. Manufacturer: For each product specified, provide components by same manufacturer throughout.
- B. Traps: Remanufactured traps are not acceptable.

1.3 SUBMITTALS

- A. Submit product data under provisions of Section 23 05 00. Include product description, model, dimensions, component sizes, rough-in requirements, service sizes, and finishes.
- B. Submit schedule indicating manufacturer, model number, size, location, rated capacity, and features for each specialty.
- C. Submit electrical power/controls wiring diagrams and product data indicating general assembly, components, safety controls, and service connections.
- D. Submit manufacturer's installation instructions.
- E. Submit operation and maintenance data.
- F. Submit certification that all steam and steam condensate specialties, accessories, and components will withstand seismic forces defined in Section 23 05 50. Include the following:
 - 1. Basis for Certification: Indicate whether certification is based on actual test of assembled components or on calculation.
 - a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
 - b. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
 - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

SECTION 23 22 18
STEAM AND STEAM CONDENSATE SPECIALTIES

PART 2 - PRODUCTS

2.1 STEAM TRAPS

- A. Furnish traps as scheduled on the drawings.
- B. Type T-1: Inverted bucket type with thermic vent, 250 psig rated, cast iron body, side inlet and outlet, and all internal components constructed of stainless steel and renewable in-line.
 - 1. Manufacturers (0-250 psig):
 - a. Armstrong Machine Works Series 800T
 - b. Spirax/Sarco Co., Inc. Type B
 - c. Hoffman Industrial Specialties Co. Series 600 T
 - d. Clark-Reliance Series 120
- C. Type T-2: Thermostatic type with body and cap of cast brass, bronze bellows, stainless steel valve head and seat.
 - 1. Manufacturers: (0-25 psig):
 - a. Spirax/Sarco Co., Inc. Type TD
 - b. Hoffman Industrial Specialties Co. Type C
 - c. Clark-Reliance Series T
- D. Type T-3: Float and thermostatic type, 125 psig rated, cast iron body; balanced pressure thermostatic air vent; stainless steel valve seat, float, brass valve mechanism, and side inlet and outlet.
 - 1. Manufacturers: (0-125 psig):
 - a. Armstrong Machine Works Type A
 - b. Hoffman Industrial Specialties Co. Series H, C, or X
 - c. Spirax/Sarco Co., Inc. Type FT
 - d. Clark-Reliance Type FT

2.2 LOCK OUT TRIM

- A. Provide lock out trim for all quarter turn valves opening to atmosphere installed in steam, condensate, boiler feed water piping, and as indicated on the drawings.

2.3 VACUUM BREAKER

- A. Spring loaded type selected or adjusted for the minimum possible opening pressure, but never over 11" water gauge.
- B. Rated for 150 psig and 366°F.
- C. Manufacturers:
 - 1. Johnson VB8
 - 2. Sarco VB14
 - 3. Hoffman 62
 - 4. B&G 26

SECTION 23 22 18
STEAM AND STEAM CONDENSATE SPECIALTIES

PART 3 - EXECUTION

3.1 INSTALLATION AND APPLICATION

A. General Installation Requirements:

1. Install specialties in accordance with manufacturer's instructions.
2. Size traps to handle minimum of two and one-half times maximum condensate load of apparatus served, unless noted otherwise.
3. All traps shall be minimum 3/4" size.
4. Install traps with unions or flanges at both ends.
5. Provide shutoff valve and strainer at inlet, and check valve and shutoff valve at discharge of traps.
6. Provide minimum 10" long dirt pocket of same size as apparatus return connection between apparatus and trap, unless noted otherwise on drawings.
7. Remove thermostatic elements from traps during temporary and trial usage, and until system has been operated and dirt pockets cleaned of sediment and scale.

B. Insulate steam and steam condensate specialties in accordance with Section 23 07 16 - HVAC Equipment Insulation and Section 23 07 19 - HVAC Piping Insulation.

END OF SECTION 232218

SECTION 23 31 00
DUCTWORK

SECTION 23 31 00 - DUCTWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Aluminum Ductwork
- B. Ductwork Reinforcement
- C. Ductwork Sealants
- D. Rectangular Ductwork
- E. Leakage Testing
- F. Ductwork Penetrations

1.2 SUBMITTALS

- A. Submit shop drawings per Section 23 05 00.
- B. Submit duct fabrication standards in compliance with SMACNA and these specifications. Clearly indicate metal gauges, reinforcement, and joining methods intended for use for each pressure classification. Furnish details of all common duct fittings and joint connections to be used on this project.
- C. The Architect/Engineer may require field verification of sheet metal gauges and reinforcing to verify compliance with these specifications. At the request of the Architect/Engineer, the contractor shall remove a sample of the duct for verification. The contractor shall repair as needed.

1.3 DEFINITIONS

- A. Duct Sizes shown on drawings are inside clear dimensions. Maintain clear dimensions inside any lining.
- B. Transitions are generally not shown in single-line ductwork. Where sizes change at a divided flow fitting, the larger size shall continue through the fitting.
- C. Exterior Duct: Ductwork located outside the conditioned envelope including exposed ductwork above the roof, outside exterior walls, in attics above insulated ceilings, inside parking garages, and crawl spaces.
- D. Interior Duct: Ductwork located within the conditioned envelope including return air plenums and indirectly conditioned spaces.

1.4 COORDINATION DRAWINGS

- A. Reference Coordination Drawings article in Section 23 05 00 for required duct systems electronic CAD drawings to be provided to Coordinating Contractor for inclusion into composite coordination drawings.

SECTION 23 31 00 DUCTWORK

- B. Duct drawings shall be at 1/4" minimum scale complete with the following information:
1. Actual duct routing, ductwork fittings, actual sheet metal dimensions including insulation liner and wrap, duct hanger and support types, ductwork accessories, etc. with lengths and weights noted.
 2. Differentiate ducts that are lined or wrapped. Include insulation thickness, type of insulation, and acoustical lagging.
 3. Location and size of all duct access doors.
 4. Room names and numbers, ceiling types, and ceiling heights.
 5. Indicate location of all beams, bar joists, etc. along with bottom of steel elevations for each member.
 6. IMEG will provide electronic file copies of ventilation drawings for contractor's use if the contractor signs and returns an "Electronic File Transfer" waiver provided by IMEG. IMEG will not consider blatant reproductions of original file copies an acceptable alternative for coordination drawings. Architectural plans will need to be obtained from the Architect.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS AND SUPPORTS

A. Rectangular Duct - Single Wall:

1. General Requirements:
 - a. All ductwork gauges and reinforcements shall be as listed in SMACNA Duct Construction Standards Chapter 2. Where necessary to fit in confined spaces, furnish heaviest duct gauge and least space consuming reinforcement.
 - b. Transitions shall not exceed the angles in Figure 4-7.
2. Exceptions and modifications to the 2005 HVAC Duct Construction Standards are:
 - a. All ducts shall be cross-broken or beaded.
 - b. Snap lock seams are not permitted.
 - c. Turning vanes shall be used in all 90° mitered elbows, unless clearly noted otherwise on the drawings. Vanes shall be as follows:
 - 1) Type 1:
 - a) Description: Single wall type with 22-gauge (0.029") or heavier vanes, 3-1/4" blade spacing, and 4" to 4-1/2" radius. Vanes hemmed if recommended by runner manufacturer. Runners shall have extra-long locking tabs. C-value independently tested at below 0.26. EZ Rail II by Sheet Metal Connectors or equal.
 - b) Usage: Limited to 3,000 fpm and vane lengths 36" and under.
 - 2) Type 2:
 - a) Description: Double wall type with 3-1/4" blade spacing, 4-1/2" radius, 24-gauge minimum, and SMACNA Type 1 runners. C-value below 0.27.
 - b) Usage: No limits other than imposed by the manufacturer. Provide intermediate support for vanes over 48" long.

SECTION 23 31 00
DUCTWORK

- 3) Type 3 (acoustical - where acoustical lagging is located or as noted on drawings):
 - a) Description: Same as Type 2, except filled with fiberglass and with slotted or perforated inner curve. Minimum insertion loss of 9 dB at 250 Hz and 6 dB at 1 KHz.
 - b) Usage: No limits other than imposed by the manufacturer. Provide intermediate support for vanes over 48" long.
 - 4) Turning vanes shall operate quietly. Repair or replace vanes that rattle or flutter.
 - 5) Runners must be installed at a 45° angle. Elbows with different size inlet and outlet must be radius type.
 - 6) Omitting every other vane is prohibited.
- d. Where smooth radius rectangular elbows are shown, they shall be constructed per SMACNA Figure 4-2. Type RE1 shall be constructed with a centerline duct radius R/W of 1.0. Where shown on drawings, Type RE3 elbows with 3 vanes shall be used with centerline duct radius R/W of 0.6 (SMACNA r/W=0.1). RE1 or RE3 elbows may be used where mitered elbows are shown if space permits. Mitered elbows (with or without turning vanes) may not be substituted for radius elbows. Do not make branch takeoffs within 4 duct diameters on the side of the duct downstream from the inside radius of radius elbows.
- e. Rectangular branch and tee connections in ducts over 1" pressure class shall be 45° entry type per Figs. 4-5 and 4-6. Rectangular straight taps are not acceptable above 1" pressure class.
- f. Bellmouth fittings shown on return duct inlets shall expand at a 60-degree total angle horizontally and vertically (space permitting) and have length of at least 25% of the smallest duct dimension.
- g. Round taps off rectangular unlined ducts shall be flanged conical or bellmouth type (equal to Buckley Bellmouth or Sheet Metal Connectors E-Z Tap), or 45° rectangular with transition to round (equal to Sheet Metal Connectors Inc. High Efficiency Takeoff). Straight taps are acceptable if pressure class is 1" or less, round duct is 12" diameter or less, and the tap is not located between fans and TAB devices.
- h. Duct offsets shall be constructed as shown on drawings. Additional offsets required in the field shall be formed of mitered elbows without turning vanes for offsets up to 30° maximum angle in accordance with SMACNA offset Type 2. Offsets of greater than 30° angle shall be formed of radius elbows with centerline radius R/W=1.0 or greater. SMACNA Type 1 offsets are not permitted.
- i. All lined duct shall utilize dovetail joints where round or conical taps occur. The dovetail joints shall extend past the liner before being folded over.
- j. Cushion heads are acceptable only downstream of TAB devices in ducts up to ± 2" pressure class, and must be less than 6" in length.
- k. Slide-on flanged transverse joint systems are acceptable provided they are a manufactured product that has been tested for conformance with Chapter 2 of the SMACNA HVAC Duct Construction Standards for sheet and joint deflection at the specified pressure class.
- 1) Apply sealant to all inside corners. Holes at corners are not acceptable.
 - 2) Manufacturers:
 - a) Ductmate Industries - 25/35/45
 - b) Nexus
 - c) Mez
 - d) WDCI

SECTION 23 31 00
DUCTWORK

- e) Other manufacturers must submit test data and fabrication standards and receive Architect/Engineer's approval before any fabrication begins.
- I. Formed-on flanged transverse joint systems are acceptable provided they are a manufactured product that has been tested for conformance with Chapter 2 of the SMACNA HVAC Duct Construction Standards for sheet and joint deflection at the specified pressure class.
 - 1) Apply sealant to all inside corners. Holes at corners are not acceptable.
 - 2) Flanges shall be 24-gauge minimum (not 26 gauge).
 - 3) Manufacturers:
 - a) Lockformer TDC
 - b) TDF
 - c) United McGill
 - d) Sheet Metal Connectors
 - e) Other manufacturers must submit test data and fabrication standards and receive Architect/Engineer's approval before any fabrication begins.
- B. Round and Flat Oval Spiral Seam Ductwork - Single Wall:
 - 1. Conform to applicable portions of Rectangular Duct Section. Round or flat oval ductwork may be substituted for rectangular ductwork where approved by the Architect/Engineer. The spiral seam ductwork shall meet the standards set forth in this specification. The ductwork shall meet or exceed the specified cross-sectional area and insulation requirements. The substitution shall be coordinated with all other trades prior to installation.
 - 2. Flat oval duct in negative pressure applications shall have flat sides reinforced as required for rectangular ducts of the same gauge with dimensions equal to the flat span of the oval duct.
 - 3. 90° elbows shall be smooth radius or have a minimum of five sections with mitered joints and R/D of at least 1.5.
 - 4. Duct and fittings shall meet the required minimum gauges listed in chapter 3 of the SMACNA requirements for the specified pressure class. Ribbed and lightweight duct are not permitted.
 - 5. Ductwork shall be suitable for velocities up to 5,000 fpm.
 - 6. Divided flow fittings may be made as separate fittings or factory installed taps with sound, airtight, continuous welds at intersection of fitting body and tap.
 - 7. Spot weld and bond all fitting seams in the pressure shell. Coat galvanizing damaged by welding with corrosion resistant paint to match galvanized duct color.
 - 8. Ducts with minor axis less than 22" shall be spiral seam type. Larger ducts may be rolled, longitudinal welded seam type. SMACNA seams RL-2 and RL-3 are not permitted.
 - 9. Reinforce flat oval ducts with external angles. Internal tie rods are permitted only as indicated for rectangular ductwork.
 - 10. Transverse Joint Connections:
 - a. Crimped joints are not permitted.
 - b. Ducts and fittings 36" in diameter and smaller shall have slip joint connections. Size fitting ends to slip inside mating duct sections with minimum 2-inch insertion length and a stop bead. Use inside slip couplings for duct-to-duct joints, and outside slip couplings for fitting-to-fitting joints.
 - c. Ducts and fittings larger than 36" shall have flanged connections.
 - d. Secure all joints with at least 3 sheet metal screws before sealing.

SECTION 23 31 00 DUCTWORK

e. Manufacturers, Slide-on Flanges:

- 1) Ductmate Industries - SpiralMate
- 2) Accuflange
- 3) Sheet Metal Connectors are acceptable.

f. Manufacturers, Self-Sealing Duct Systems:

- 1) Lindab
- 2) Ward "Keating Coupling"

C. Hangers and Supports General Requirements:

1. Hanger and support materials shall be as defined within Materials and Application Specific section below.
2. Strap Hangers: Strap hanger shall be a minimum of 1 inch, 18 gauge attached to the bottom of ducts.
3. Cable Hangers:
 - a. Aircraft cable and slip cable hangers are acceptable for ducts up to 18" diameter. Protective sleeve tubing shall be used on the cable when supporting duct with exterior insulation. Corner saddles are required when supporting rectangular ductwork.
 - b. Manufacturers; Supports:
 - 1) Gripple
 - 2) Ductmate
 - 3) Duro Dyne
 - 4) Architect/Engineer approved
4. Integral Corner Connector Hanger: Integral hanger and corner assembly for use with TDC/TDF style duct flanges. Die stamped offset hanger connects to the flanged corner assembly. For use with aircraft cable or 1/4" or 3/8" diameter threaded rods. Tested to hold up to 1,400 lbs.. Install per manufacturer's ratings and instructions.
 - a. Manufacturers; Supports:
 - 1) EZ Hanger

2.2 MATERIAL AND APPLICATION SPECIFIC

A. Aluminum Ductwork:

1. General Requirements:
 - a. Material: ASTM B209; aluminum sheet, Alloy 3003-H14. Aluminum connectors and bar stock: Alloy 6061-T6. Aluminum or stainless steel fasteners are acceptable.
 - b. All duct gauges and reinforcement shall be as called for in Tables 2-50, 2-51, 2-52, and 3-14 of the SMACNA HVAC Duct Construction Standards.
 - c. Ductwork reinforcement shall be of aluminum.
2. Duct Hangers and Supports Material:
 - a. Ductwork hangers and supports shall be of aluminum. Slip cable hangers are acceptable if constructed of aluminum.
 - b. All fasteners shall be aluminum.

SECTION 23 31 00
DUCTWORK

B. Duct Hangers and Support Material:

1. Ductwork hangers and supports shall be of galvanized or painted steel.
2. All fasteners shall be galvanized, or cadmium plated.

C. Exposed Ductwork (Rectangular, Round, and Flat Oval):

1. The following applies to all ductwork exposed in finished areas in addition to requirements noted above:
 - a. Provide extra shipping protection. Use Cardboard or other protective means to prevent dents and deformed ends.
 - b. Provide cardboard or other means of protection during field fabrication. Protect from scratches. Provide stiffeners to retain shape during fabrication.
 - c. Remove all identification stickers and thoroughly clean exterior of all ducts.
 - d. Locate fitting seams on least visible side of duct.
 - e. Provide exterior finish suitable for field painting without further oil removal.
 - f. Provide ramp-type internal joint couplings. Provide bead of sealant around the inside of the duct about 1/2" from the end of the duct.
 - g. All insulation shall be internal, except at reheat coils.
2. In addition to the paragraphs above, this section applies to all ductwork specified or shown as "Architecturally Exposed":
 - a. All spiral ductwork fittings shall be carbon arc welded.
 - b. Grind all welds to remove irregularities.
 - c. Conical taps shall be one piece. Taps for grilles and takeoffs shall be factory installed with a continuous weld and ground smooth.
 - d. Welds shall be ground smooth and painted.
 - e. All architecturally exposed ducts shall be round or flat oval except where not possible (grilles, reheat coils, etc.).
3. Alternate manufacturers, including shop fabricated duct, must be reviewed before installation. The following information is required:
 - a. Metal gauge of duct and fittings.
 - b. Fitting type and construction.
 - c. Type and size of reinforcement.

2.3 DUCTWORK REINFORCEMENT

- A. All reinforcement shall be external to the duct except that tie rods may be used with the following limitations.
1. Ducts must be over 18" wide.
 2. Duct dimensions must be increased 2" in one dimension (h or w) for each row of tie rods installed.
 3. Tie rods must not exceed 1/2" diameter.
 4. Manufacturer of tie rod system must certify pressure classifications of various arrangements, and this must be in the shop drawings.

SECTION 23 31 00 DUCTWORK

2.4 DUCTWORK SEALANTS

- A. One-part joint sealers shall be water-based mastic systems that meet the following requirements: maximum 48-hour cure time, service temperature of -20°F to +175°F, resistant to mold, mildew and water, flame spread rating below 25 and smoke-developed rating below 50 when tested in accordance with ASTM E84, suitable for all SMACNA seal classes and pressure classes. Mastic used to seal flexible ductwork shall be marked UL 181B-M.
- B. Two-part joint sealers shall consist of a minimum 3" wide mineral-gypsum compound impregnated fiber tape and a liquid sealant. Sealant system shall meet the following requirements: maximum 48-hour cure time, service temperature of 0°F to 200°F, resistant to mold, mildew, and water, flame spread rating below 25 and smoke developed rating below 50 when tested in accordance with ASTM E84, suitable for all SMACNA seal classes and pressure classes.
- C. Pressure sensitive tape used for sealing ductwork shall be minimum 2.5-inch wide, listed and marked UL 181A-P, having minimum 60 oz/inch peel adhesion to steel, and service temperature range from -20°F to +250°F.
- D. Where pressure sensitive tape is called for on drawings and specifications for sealing flexible ductwork, tape shall be minimum 2.5-inch wide, UL 181 B-FX listed, and marked tape having minimum 60 oz/inch peel adhesion to steel and service temperature range from -20°F to +250°F.
 - 1. Manufacturers, Pressure-Sensitive Tape:
 - a. Venture Tape 1581A
 - b. Compac #340
 - c. Scotch Foil Tape 3326
 - d. Polyken 339

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide openings in ducts for thermometers and controllers.
- B. Locate ducts with space around equipment for normal operation and maintenance.
- C. Do not install ducts or other equipment above electrical switchboards or panelboards. This includes a dedicated space extending 25 feet from the floor to the structural ceiling with width and depth equal to the electrical equipment. Unless intended to serve these rooms, do not install any ductwork or equipment in electrical rooms, transformer rooms, electrical closets, telephone rooms or elevator machine rooms.
- D. Provide temporary closures of metal or taped polyethylene on open ducts to prevent dust from entering ductwork.
- E. Supply ductwork shall be free of construction debris, and shall comply with Level "B" of the SMACNA Duct Cleanliness for New Construction Guidelines.
- F. Repair all duct insulation and liner tears.
- G. Install manual volume dampers in branch supply ducts so all outlets can be adjusted. Do not install dampers at air terminal device or in outlets, unless specifically shown.

SECTION 23 31 00 DUCTWORK

- H. Insulate terminal air box reheat coils. Seal insulation tight to form a tight vapor barrier.
- I. Install flexible duct in accordance with the ADC Flexible Duct Performance and Installation Standards.
- J. Install all exterior ductwork per SMACNA Fig. 6-3. Where drawings do not indicate otherwise, ductwork seams and joints shall be sealed watertight and pitched to shed water.
- K. Support all duct systems in accordance with the SMACNA HVAC Duct Construction Standards: Metal and Flexible and the SMACNA Seismic Restraint Manual: Guidelines for Mechanical Systems, where applicable. Refer to Section 23 05 50 for seismic requirements.
- L. Adhesives, sealants, tapes, vapor retarders, films, and other supplementary materials added to ducts, plenums, housing panels, silencers, etc. shall have flame spread/smoke developed ratings of under 25/50 per ASTM E84, NFPA 255, or UL 723.
- M. All duct support shall extend directly to building structure. Do not support ductwork from pipe hangers unless coordinated with piping contractor prior to installation. Do not allow lighting or ceiling supports to be hung from ductwork or ductwork supports.

3.2 DUCTWORK APPLICATION SCHEDULE

- A. Refer to Ductwork Application Schedule below for specific requirements for system, material, shape, pressure class, seal class and insulation application.
- B. Example #15 General Exhaust Duct:
 - 1. Shape:
 - a. Rectangular Duct - Single Wall
 - b. Round and Flat Oval Spiral Seam Ductwork - Single Wall
 - 2. Material: Aluminum
 - 3. Pressure Class: -2"
 - 4. Seal Class: A
 - 5. Insulation: None
 - 6. Additional Requirements: None

3.3 SPECIAL INSULATION REQUIREMENTS

- A. Ductwork Accessories (Fabric Flex Connectors, Equipment Flanges, etc.):
 - 1. Insulation:
 - a. ASHRAE 90.1-2022: 1-1/2" thick Type A (R=4.5)
 - b. IECC-2021: 1-1/2" thick Type A (R=4.5)

3.4 DUCTWORK SEALING

- A. General Requirements:
 - 1. Openings, such as rotating shafts, shall be sealed with bushings or similar.
 - 2. Pressure sensitive tape shall not be used as the primary sealant unless it has been certified to comply with UL-181A or UL-181B by an independent testing laboratory and the tape is used in accordance with that certification.

SECTION 23 31 00 DUCTWORK

3. All connections shall be sealed including, but not limited to, taps, other branch connections, access doors, access panels, and duct connections to equipment. Sealing that would void product listings is not required. Spiral lock seams need not be sealed.
 4. Mastic-based duct sealants shall be applied to joints and seams in minimum 3 inch wide by 20 mil thick bands using brush, putty knife, trowel, or spray, unless manufacturer's data sheet specifies other application methods or requirements.
- B. All ducts systems, regardless of pressure class, shall be Seal Class A as defined by Section 5-1 of SMACNA HVAC Air Duct Leakage Test Manual per the Energy Code, unless specifically noted otherwise. Seal Class A shall include sealing of all transverse joints, longitudinal seams, and duct wall penetrations with welds, gaskets, mastics, or fabric-embedded mastic system. Joints are inclusive of, but not limited to, girth joints, branch and sub-branch intersections, duct collar tap-ins, fitting subsections, louver and air terminal connections to ducts, access door and access panel frames and jambs, duct, plenum, and casing abutments to building structures.
- C. Double-wall ductwork: Install insulation end fittings at all transitions from double to single-wall construction.
- D. Special Requirements for Dedicated Outside Air Systems (DOAS):
1. Apply aluminum-based adhesive sealant tape at non-flanged joints on ducts serving dedicated outside air supply (DOAS) and exhaust system in addition to Class A sealant.
 2. Apply aluminum-based adhesive sealant tape on TAB boxes (all seams and joints of the box and duct connections) serving dedicated outside air supply (DOAS) system.
- 3.5 TESTING
- A. Interior Duct - Less than 3" WG (positive or negative):
1. Leak testing of these pressure classes is not normally required for interior ductwork (inside the building envelope). However, leak tests will be required if, in the opinion of the Architect/Engineer, the leakage appears excessive. All exterior ductwork shall be tested. If duct has outside wrap, testing shall be done before it is applied.
 2. Leak test shall be at the Contractor's expense and shall require capping and sealing all openings.
 3. Seal ducts to bring the air leakage into compliance.
 4. Contractor shall notify the Architect/Engineer five business days prior to pressurizing ductwork for testing.
- B. Test Procedure:
1. Testing shall be as listed in the latest edition of the SMACNA HVAC Duct Leakage Manual, with the following additional requirements:
 - a. The required leakage class for Seal Class A, rectangular ducts, shall be 4; round shall be 2.
 - b. Test pressure shall be the specified duct pressure class. Testing at reduced pressures and converting the results mathematically is not acceptable. This is required to test the structural integrity of the duct system.
 - c. If any leak causes discernible noise at a distance of 3 feet, that leak shall be eliminated, regardless of whether that section of duct passed the leakage test.
 - d. All joints shall be felt by hand, and all discernible leaks shall be sealed.
 - e. Totalling leakage from several tested sections and comparing them to the allowable leakage for the entire system is not acceptable. Each section must pass the test individually.

SECTION 23 31 00
DUCTWORK

- f. Contractor shall notify the Architect/Engineer five business days prior to pressurizing ductwork for testing. Failure to notify the Architect/Engineer of pressure testing may require the contractor to repeat the duct pressure test after proper notification.
- g. Upon completion of the pressure test, the contractor shall submit an air duct leakage test summary report as outlined in the SMACNA HVAC Duct Leakage Test Manual.
- h. All access doors, taps to terminal air boxes, and other accessories and penetrations must be installed prior to testing. Including terminal air boxes in the test is not required.
- i. Positive pressure leakage testing is acceptable for negative pressure ductwork.

3.6 DUCTWORK PENETRATIONS

- A. All duct penetrations of firewalls shall have fire or fire/smoke dampers where required by code.
- B. Dampers shall be compatible with fire rating of wall assembly. Verify actual rating of any wall being penetrated with Architect/Engineer.
- C. Seal all duct penetrations of walls that are not fire rated by caulking or packing with fiberglass. Install trim strip to cover vacant space and raw construction edges of all openings in finished rooms. Install escutcheon ring at all round duct openings in finished rooms. Trim strips and rings shall be same material and finish as exposed duct.

END OF SECTION 233100

SECTION 23 34 23 POWER VENTILATORS

SECTION 23 34 23 - POWER VENTILATORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Roof Exhaust Fan.
- B. Rooftop Fan Curbs.

1.2 QUALITY ASSURANCE

- A. Performance Ratings: Conform to AMCA 210 and bear AMCA Certified Rating Seal.
- B. Sound Ratings: AMCA 301, tested to AMCA 300.
- C. Fabrication: Conform to AMCA 99.
- D. Fan Energy Index (FEI): Fans shall meet or exceed the minimum FEI scheduled at the specified airflow, pressure, and air density (duty point). In no case shall the FEI at the specified duty point fall below 1.1.

1.3 REFERENCES

- A. AMCA 208 - Calculation of the Fan Energy Index (FEI).
- B. AMCA 210 - Laboratory Methods of Testing Fans for Rating Purposes.
- C. AMCA 230 - AMCA 230 - Laboratory Methods of Testing Air Circulating Fans for Rating and Certification.
- D. AMCA 300 - Test Code for Sound Rating Air Moving Devices.
- E. AMCA 301 - Method of Publishing Sound Ratings for Air Moving Devices.
- F. ANSI/AFBMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
- G. ANSI/AFBMA 11 - Load Ratings and Fatigue Life for Roller Bearings.
- H. SMACNA - HVAC Duct Construction Standards (latest edition).

1.4 EXTRA STOCK

- A. Provide one (1) extra belt set for each fan unit.

PART 2 - PRODUCTS

2.1 ROOFTOP EXHAUST FAN - DIRECT DRIVEN

- A. Fan Wheel: Centrifugal type, aluminum or composite with backward inclined or airfoil blades, statically and dynamically balanced.

SECTION 23 34 23
POWER VENTILATORS

- B. Housing: Removable, spun aluminum dome or rectangular top, with square, one piece, aluminum base and curb cap with Venturi inlet cone.
- C. Fan Shaft: Turned, ground and polished steel; keyed to wheel hub.
- D. Any steel parts shall be galvanized or epoxy coated. Non-corrosive fasteners.
- E. Direct drive, motor mounted outside of airstream and ventilated with outside air.
- F. Aluminum or brass bird screen. Plastic mesh will not be allowed.
- G. Mill aluminum finish.
- H. Dampers: Furnish normally closed, electric motorized damper. Provide step-down transformer if required. Install and wire damper to open when fan runs. Dampers shall be aluminum with brass bushings, blade seals and blade tie rods. Leakage shall not exceed 4 cfm/sq.ft @1" SP (or shall be AMCA Class 1 certified).
- I. Motor (as scheduled on drawings):
 - 1. Electronically Commutated Motor (ECM): Motor shall be variable speed, constant torque, brushless permanent magnet (PM) motor for direct-drive applications. Electronics shall be encapsulated for moisture protection and shall include integral surge protection. Motor and controller shall be pre-wired for specific voltage and phase. Motor frame shall be NEMA 48; All EC motors shall be a minimum of 85% efficient at all speeds. Provide motor with onboard motor control module. Motor speed shall be limited to provide electronic overcurrent protection. Provide non-fused, with thermal overload protection, factory mounted and wired disconnect switch mounted inside fan housing. Starter shall provide soft start to reduce inrush current and shall be controllable from 20% to 100% of full rated speed. Operational mode shall be as follows:
 - a. ECM set for constant CFM.
- J. Speed Controller: For single phase shaded pole or permanent split capacity motor fans, furnish solid-state dial speed controller factory mounted inside fan unless shown otherwise on the drawings. Provide permanent marking at balanced point.
- K. Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
- L. Manufacturers:
 - 1. Aerovent "FACX"
 - 2. Cook "ACE-D"
 - 3. Greenheck
 - 4. ILG - CRD
 - 5. ACME PX
 - 6. PennBarry DX
 - 7. Carnes
 - 8. Twin City DCRU
 - 9. Jenco
 - 10. Soler-Palau
 - 11. York

2.2 ROOFTOP FAN CURBS

- A. Furnish and install prefabricated roof curbs for all rooftop fans.

SECTION 23 34 23
POWER VENTILATORS

- B. Size curb to match the curb cap of fan.
- C. Roof Mounting Curb: Curb height as shown on drawings, minimum 14 gauge galvanized steel, one-piece construction, insulated, all welded, wood nailer.
- D. Construction: Unitized construction, continuous arc welded corner seams. Insulated with 1-1/2" thick, 3 lb. density rigid fiberglass board. Damper support angle. Pressure treated wood nailer. Curb without cant.
 - 1. 18-gauge galvanized steel.
- E. If called for in the drawings, curbs shall be of the sound attenuation type. Sound attenuation curbs shall reduce the fan sound rating by at least 40% and not decrease fan cfm more than 8% (which is accounted for in the scheduled fan cfm). Baffles shall be removable for access to the dampers.
- F. Manufacturers:
 - 1. Same manufacturer as the fan

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure roof exhausters with cadmium plated lag screws to roof curb.
- C. If manufacturer has no recommendations, secure roof exhaust fans to curbs with 1/4" lag bolts on 8" maximum centers.
- D. MC shall install and wire factory provided damper to open when the fan runs if the manufacturer does not provide an option to pre-wire the damper.

END OF SECTION 233423

SECTION 23 37 00
AIR INLETS AND OUTLETS

SECTION 23 37 00 - AIR INLETS AND OUTLETS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Grilles And Registers.

1.2 QUALITY ASSURANCE

- A. Test and rate performance of air inlets and outlets per ASHRAE 70.
- B. Test and rate performance of louvers per AMCA 500L-99.
- C. All air handling and distribution equipment mounted outdoors shall be designed to prevent rain intrusion into the airstream when tested at design airflow and with no airflow, using the rain test apparatus described in Section 58 of UL 1995.

1.3 REFERENCES

- A. AMCA 500-L-12 - Laboratory Methods of Testing Louvers for Rating.
- B. ANSI/ASHRAE 70 - Method of Testing for Rating the Air Flow Performance of Inlets and Outlets.
- C. ANSI/ASHRAE/IES Standard 90.1 (latest published edition) - Energy Standard for Buildings Except Low-Rise Residential Buildings.
- D. ASHRAE 170 (latest published edition) - Ventilation of Health Care Facilities.
- E. SMACNA - Duct Construction Standards.

1.4 SUBMITTALS

- A. Submit product data under provisions of Section 23 05 00.
- B. Submit schedule of inlets and outlets indicating type, size, location, application, and noise level.
- C. Review requirements of inlets and outlets as to size, finish, and type of mounting prior to submitting product data and schedules of inlets and outlets.
- D. Submit manufacturer's installation instructions.
- E. Submit electrical power/controls wiring diagrams and product data indicating general assembly, components, safety controls, and service connections.

1.5 REGULATORY REQUIREMENTS

- A. Conform to ANSI/NFPA 90A.
- B. Conform to ASHRAE 90.1.

SECTION 23 37 00
AIR INLETS AND OUTLETS

1.6 EXTRA STOCK

- A. Provide clean filters in all filter return grilles at time of installation.
- B. Provide one additional set of replacement filters for all filter return grilles. Deliver to Owner at job site.

PART 2 - PRODUCTS

2.1 AIR TERMINALS - GRILLES AND REGISTERS

- A. Reference to a grille means an air supply, exhaust or transfer device without a damper.
- B. Reference to a register means an air supply, exhaust or transfer device with a damper.
- C. The type of unit, margin, material, finish, etc., shall be as shown on the drawing schedule and suitable for the intended use.
- D. All margins shall be compatible with ceiling types specified (including 'Thin-Line' T-bar lay-in grid system). Any discrepancies in contract documents shall be brought to the attention of the Architect/Engineer, in writing, prior to Bid Date. Submission of Bid indicates ceiling and air inlet and outlet types have been coordinated.
- E. The capacity and size of the unit shall be as shown on the drawings.
- F. All units shall handle the indicated cfm as shown on the drawings while not exceeding an NC level of 25, referenced to 10^{-12} watts with a 10 dB room effect.
- G. Refer to the drawings for construction material, color and finish, margin style, deflection, and sizes of grilles and registers.
- H. Provide with 3/4" blade spacing. Blades shall have steel friction pivots to allow for blade adjustment, plastic pivots are not acceptable.
- I. Corners of steel grilles and registers shall be welded and ground smooth before painting. Aluminum grilles and registers shall have staked corners.
- J. Where specified to serve registers, provide opposed blade volume dampers operable from the face of the register.
- K. Screw holes for surface fasteners shall be countersunk for a neat appearance. Provide concealed fasteners for installation in lay-in ceilings and as specified on the drawings.
- L. Manufacturers:
 - 1. Tuttle & Bailey
 - 2. Titus
 - 3. Price
 - 4. Nailor
 - 5. Carnes
 - 6. Metalaire
 - 7. Krueger
 - 8. Anemostat
 - 9. Raymon Donco

SECTION 23 37 00
AIR INLETS AND OUTLETS

PART 3 - EXECUTION

3.1 INSTALLATION

A. General Installation Requirements:

1. Install items in accordance with manufacturers' instructions.
2. Install seismic restraints according to SMACNA's "Kitchen Equipment Fabrication Guidelines, Appendix 1, Guidelines for Seismic Restraints for Kitchen Equipment".
3. Check location of inlets and outlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.
4. Install diffusers to ductwork with air tight connections.
5. Flexible ducts shall NOT be joined to flat-oval connections. Provide sheet metal oval-to-round transitions where required.
6. Supply air diffusers in operating rooms (Class B and C surgery) shall be opened and cleaned before the space is used.
7. Supply grille and register blades shall be aimed in the field to provide adequate air distribution in the space. All return grilles and registers blades shall be oriented to minimize sight distance beyond installed device.

B. Volume Damper:

1. Provide manual volume dampers on duct take-off to diffusers when there are multiple connections to a common duct. Locate volume dampers as far as possible from the air inlet or outlet.

C. Maintaining Duct Cleanliness:

1. When grilles, registers, and diffusers are installed, Contractor shall prevent construction dust, dirt, and debris from entering ductwork as required by Section 23 05 00.

END OF SECTION 233700

SECTION 23 82 00
TERMINAL HEAT TRANSFER UNITS

SECTION 23 82 00 - TERMINAL HEAT TRANSFER UNITS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Unit Heaters.

1.2 QUALITY ASSURANCE

- A. All filters shall be UL listed Class 1 or Class 2.
- B. All electrical equipment shall have a UL label.
- C. Factory wired equipment shall conform to ANSI/NFPA 70.

1.3 SUBMITTALS

- A. Submit shop drawings per Section 23 05 00.
- B. Submit catalog data including arrangements, cross sections of cabinets, grilles, bracing, typical elevations.
- C. Submit schedules of equipment and enclosures indicating length, number of pieces of element and enclosure, corner pieces, end caps, cap strips, access doors, and comparison of specified to actual heat output.
- D. Indicate mechanical and electrical service locations and requirements. Show deviations from scheduled products.
- E. Submit manufacturers' installation instructions.
- F. Submit electrical power/controls wiring diagrams and product data indicating general assembly, components, safety controls, and service connections.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Protect units from physical damage by storing in protected areas and leaving factory covers in place.

1.5 REGULATORY REQUIREMENTS

- A. Conform to ASHRAE 90.1.

1.6 OPERATION AND MAINTENANCE DATA

- A. Submit manufacturer's operation and maintenance data. Include operating, installation, maintenance and repair data, and parts listings.

SECTION 23 82 00
TERMINAL HEAT TRANSFER UNITS

PART 2 - PRODUCTS

2.1 UNIT HEATERS

- A. Casings shall be heavy gauge steel with a baked finish.
- B. Coils shall have copper heads and tubes, and aluminum fins.
- C. Units shall have threaded pipe connections for hanger rods.
- D. Fans shall be direct drive propeller type, factory balanced, with fan guards and totally enclosed motors with integral thermal overload protection.
- E. Horizontal units shall have adjustable outlet air louvers.
- F. Provide unit mounted and wired disconnect switch. Contractor shall be responsible for providing and wiring disconnect when using a manufacturer who does not provide factory mounted option.
- G. Products:
 - 1. Trane - S or P
 - 2. Daikin - UHH or UDH
 - 3. Modine - HS or V
 - 4. Vulcan - HV or VV
 - 5. Sterling HS or VS
 - 6. Zehnder-Rittling - H or V
 - 7. Sigma H or V
 - 8. Airtherm HA or VA

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General Installation Requirements:
- B. Install all products per manufacturers' instructions.
 - 1. Coordinate recess sizes for recessed equipment.
 - 2. Protect units with protective covers during construction.
 - 3. Comb all coils to repair bent fins.
- C. Unit Heater:
 - 1. Hang unit heaters from building structure, not from piping. Mount as high as possible within manufacturer's recommended mounting height requirements. If unit heaters cannot be installed within manufacturer's recommended range, notify Architect/Engineer prior to mounting.

3.2 CLEANING

- A. After construction is complete, including painting, clean exposed surfaces of units. Vacuum clean coils and inside of cabinets.

SECTION 23 82 00
TERMINAL HEAT TRANSFER UNITS

- B. Touch-up marred or scratched surfaces of factory-finished cabinets, with materials furnished by manufacturer.
- C. Install new filters.

END OF SECTION 238200

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

SECTION 26 05 00 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Requirements applicable to all Division 26 Sections. Also refer to Division 1 - General Requirements. This section is also applicable to Fire Alarm and Detection Systems Section 28 31 00.
- B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 REFERENCES

- A. NFPA 70 - National Electrical Code (NEC)

1.3 SCOPE OF WORK

- A. This Specification and the associated drawings govern furnishing, installing, testing and placing into satisfactory operation the Electrical Systems.
- B. The Contractor shall furnish and install all new materials as indicated on the drawings, and/or in these specifications, and all items required to make the portion of the Electrical Work a finished and working system.
- C. Separate contracts will be awarded for the following work.
- D. All work will be awarded under a single General Contract. The division of work listed below is for the Contractor's convenience and lists normal breakdown of the work.
- E. Separate contracts will be awarded for the following work. The division of work listed below is for the contractors' convenience and lists a normal breakdown of the work. Please refer to the Construction Manager's scope statements for complete scope of work description.
- F. Description of Systems shall be as follows:
 - 1. Electrical power system to and including luminaires, equipment, motors, devices, etc.
 - 2. Grounding system.
 - 3. Fire alarm system.
 - 4. Wiring system for temperature control system as shown on the drawings.
 - 5. Removal work and/or relocation and reuse of existing systems and equipment.
- G. Work Not Included:
 - 1. Temperature control wiring for plumbing and HVAC equipment (unless otherwise indicated) will be by other Contractors.

1.4 OWNER FURNISHED PRODUCTS

- A. The Owner will supply manufacturer's installation data for Owner-purchased equipment for this project.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

- B. This Contractor shall make all electrical system connections shown on the drawings **or** required for fully functional units.
- C. This Contractor is responsible for all damage to Owner furnished equipment caused during installation.

1.5 WORK SEQUENCE

- A. All work that will produce excessive noise or interference with normal building operations, as determined by the Owner, shall be scheduled with the Owner. It may be necessary to schedule such work during unoccupied hours. The Owner reserves the right to determine when restricted construction hours are required.
- B. Itemize all work and list associated hours and pay scale for each item.

1.6 DIVISION OF WORK BETWEEN MECHANICAL, ELECTRICAL, and CONTROL CONTRACTORS

- A. Division of work is the responsibility of the Prime Contractor. Any scope of work described at any location on the contract document shall be sufficient for including said requirement in the project. The Prime Contractor shall be solely responsible for determining the appropriate subcontractor for the described scope. In no case shall the project be assessed an additional cost for scope that is described on the contract documents on bid day. The following division of responsibility is a guideline based on typical industry practice.
- B. Definitions:
 - 1. "Mechanical Contractors" refers to the Contractors listed in Division 21/22/23 of this Specification.
 - 2. "Technology Contractors" refers to the Contractors furnishing and installing systems listed in Division 27/28 of this Specification.
 - 3. Motor Power Wiring: The single phase or 3 phase wiring extending from the power source (transformer, panelboard, feeder circuits, etc.) through disconnect switches and motor controllers to, and including the connections to the terminals of the motor.
 - 4. Motor Control Wiring: The wiring associated with the remote operation of the magnetic coils of magnetic motor starters or relays, or the wiring that permits direct cycling of motors by means of devices in series with the motor power wiring. In the latter case, the devices are usually single phase, have "Manual-Off-Auto" provisions, and are usually connected into the motor power wiring through a manual motor starter.
 - 5. Control devices such as start-stop push buttons, thermostats, pressure switches, flow switches, relays, etc., generally represent the types of equipment associated with motor control wiring.
 - 6. Motor control wiring is single phase and usually 120 volts. In some instances, the voltage will be the same as the motor power wiring. When the motor power wiring exceeds 120 volts, a control transformer is usually used to give a control voltage of 120 volts.
 - 7. Temperature Control Wiring: The wiring associated with the operation of a motorized damper, solenoid valve or motorized valve, etc., either modulating or two-position, as opposed to wiring that directly powers or controls a motor used to drive equipment such as fans, pumps, etc. This wiring will be from a 120-volt source and may continue as 120 volt, or be reduced in voltage (24 volt), in which case a control transformer shall be furnished as part of the temperature control wiring.
 - 8. Control Motor: An electric device used to operate dampers, valves, etc. It may be two-position or modulating. Conventional characteristics of such a motor are 24 volts, 60 cycles, 1 phase, although other voltages may be encountered.
 - 9. Low Voltage Technology Wiring: The wiring associated with the technology systems, used for analog or digital signals between equipment.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

10. Telecommunications/Technology Rough-in: Relates specifically to the backboxes, necessary plaster rings and other miscellaneous hardware required for the installation or mounting of telecommunications/technology information outlets.

C. General:

1. The purpose of these Specifications is to outline the Electrical and Mechanical Contractors' responsibilities related to electrical work required for items such as temperature controls, mechanical equipment, fans, chillers, compressors, etc. The exact wiring requirements for much of the equipment cannot be determined until the systems have been selected and submittals approved. Therefore, the electrical drawings show only known wiring related to such items. All wiring not shown on the electrical drawings, but required for mechanical systems, is the responsibility of the Mechanical Contractor.
2. Where the drawings require the Electrical Contractor to wire between equipment furnished by the Mechanical Contractor, such wiring shall terminate at terminals provided in the equipment. The Mechanical Contractor shall furnish complete wiring diagrams and supervision to the Electrical Contractor and designate the terminal numbers for correct wiring.
3. The Electrical Contractor shall establish electrical utility elevations prior to fabrication and installation. The Electrical Contractor shall coordinate utility elevations with other trades. When a conflict arises, priority shall be as follows:
 - a. Luminaires.
 - b. Gravity flow piping, including steam and condensate.
 - c. Electrical bus duct.
 - d. Sheet metal.
 - e. Cable trays, including access space.
 - f. Other piping.
 - g. Conduits and wireway.

D. Mechanical Contractor's Responsibility:

1. Assumes responsibility for internal wiring of all equipment furnished by the Mechanical Contractor.
2. Assumes all responsibility for miscellaneous items furnished by the Mechanical Contractor that require wiring but are not shown on the electrical drawings or specified in the Electrical Specification. If items such as relays, flow switches, or interlocks are required to make the mechanical system function correctly or are required by the manufacturer, they are the responsibility of the Mechanical Contractor.
3. Assumes all responsibility for Temperature Control wiring, if the Temperature Control Contractor is a Subcontractor to the Mechanical Contractor.
4. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

E. Temperature Control Contractor's or Subcontractor's Responsibility:

1. Wiring of all devices needed to make the Temperature Control System functional.
2. Verifying any control wiring on the electrical drawings as being by the Electrical Contractor. All wiring required for the Control System, but not shown on the electrical drawings, is the responsibility of the Temperature Control Contractor or Subcontractor.
3. Coordinating equipment locations (such as PE's, EP's, relays, transformers, etc.) with the Electrical Contractor, where wiring of the equipment is by the Electrical Contractor.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

F. Electrical Contractor's Responsibility:

1. Furnishes and installs all combination starters, manual starters and disconnect devices shown on the Electrical Drawings or indicated to be by the Electrical Contractor in the Mechanical Drawings or Specifications.
2. Installs and wires all remote-control devices furnished by the Mechanical Contractor or Temperature Control Contractor when so noted on the Electrical Drawings.
3. Furnishes and installs motor control and temperature control wiring, when noted on the drawings.
4. Furnishes, installs, and connects all relays, etc., for automatic shutdown of certain mechanical equipment (supply fans, exhaust fans, etc.) upon actuation of the Fire Alarm System.
5. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

1.7 QUALITY ASSURANCE

A. Contractor's Responsibility Prior to Submitting Pricing/Bid Data:

1. The Contractor is responsible for constructing complete and operating systems. The Contractor acknowledges and understands that the Contract Documents are a two-dimensional representation of a three-dimensional object, subject to human interpretation. This representation may include imperfect data, interpreted codes, utility guides, three-dimensional conflicts, and required field coordination items. Such deficiencies can be corrected when identified prior to ordering material and starting installation. The Contractor agrees to carefully study and compare the individual Contract Documents and report at once in writing to the Architect/Engineer any deficiencies the Contractor may discover. The Contractor further agrees to require each subcontractor to likewise study the documents and report at once any deficiencies discovered.
2. The Contractor shall resolve all reported deficiencies with the Architect/Engineer prior to awarding any subcontracts, ordering material, or starting any work with the Contractor's own employees. Any work performed prior to receipt of instructions from the Architect/Engineer will be done at the Contractor's risk.

B. Qualifications:

1. Only products of reputable manufacturers as determined by the Architect/Engineer are acceptable.
2. All Contractors and subcontractors shall employ only workmen who are skilled in their trades. At all times, the number of apprentices at the job site shall be less than or equal to the number of journeymen at the job site.

C. Compliance with Codes, Laws, Ordinances:

1. Conform to all requirements of the City of Milan, IL Codes, Laws, Ordinances and other regulations having jurisdiction.
2. If there is a discrepancy between the codes and regulations and these specifications, the Architect/Engineer shall determine the method or equipment used.
3. If the Contractor notes, at the time of bidding, that any parts of the drawings or specifications do not comply with the codes or regulations, Contractor shall inform the Architect/Engineer in writing, requesting a clarification. If there is insufficient time for this procedure, Contractor shall submit with the proposal a separate price to make the system comply with the codes and regulations.
4. All changes to the system made after the letting of the contract to comply with codes or the requirements of the Inspector, shall be made by the Contractor without cost to the Owner.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

5. If there is a discrepancy between manufacturer's recommendations and these specifications, the manufacturer's recommendations shall govern.
6. If there are no local codes having jurisdiction, the current issue of the National Electrical Code shall be followed.

D. Permits, Fees, Taxes, Inspections:

1. Procure all applicable permits and licenses.
2. Abide by all laws, regulations, ordinances, and other rules of the State or Political Subdivision where the work is done, or as required by any duly constituted public authority.
3. Pay all charges for permits or licenses.
4. Pay all fees and taxes imposed by State, Municipal, and other regulatory bodies.
5. Pay all charges arising out of required inspections by an authorized body.
6. Pay all charges arising out of required contract document reviews associated with the project and as initiated by the Owner or authorized agency/consultant.
7. Where applicable, all fixtures, equipment and materials shall be listed by Underwriter's Laboratories, Inc. or a nationally recognized testing organization.
8. Pay all telephone company charges related to the service or change in service.

E. Examination of Drawings:

1. The drawings for the electrical work are completely diagrammatic, intended to convey the scope of the work and to indicate the general arrangements and locations of equipment, outlets, etc., and the approximate sizes of equipment.
2. Contractor shall determine the exact locations of equipment and rough-ins, and the exact routing of raceways to best fit the layout of the job. Conduit entry points for electrical equipment including, but not limited to, panelboards, switchboards, switchgear and unit substations, shall be determined by the Contractor unless noted in the contract documents.
3. Scaling of the drawings will not be sufficient or accurate for determining these locations.
4. Where job conditions require reasonable changes in arrangements and locations, such changes shall be made by the Contractor at no additional cost to the Owner.
5. Because of the scale of the drawings, certain basic items, such as junction boxes, pull boxes, conduit fittings, etc., may not be shown, but where required by other sections of the specifications or required for proper installation of the work, such items shall be furnished and installed.
6. If an item is either shown on the drawings or called for in the specifications, it shall be included in this contract.
7. The Contractor shall determine quantities and quality of material and equipment required from the documents. Where discrepancies arise between drawings, schedules and/or specifications, the greater and better-quality number shall govern.
8. Where used in electrical documents the word "furnish" shall mean supply for use, the word "install" shall mean connect up complete and ready for operation, and the word "provide" shall mean to supply for use and connect up complete and ready for operation.
9. Any item listed as furnished shall also be installed unless otherwise noted.
10. Any item listed as installed shall also be furnished unless otherwise noted.

F. Electronic Media/Files:

1. Construction drawings for this project have been prepared utilizing Revit.
2. Contractors and Subcontractors may request electronic media files of the contract drawings and/or copies of the specifications. Specifications will be provided in PDF format.
3. Upon request for electronic media, the Contractor shall complete and return a signed "Electronic File Transmittal" form provided by IMEG.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

4. If the information requested includes floor plans prepared by others, the Contractor will be responsible for obtaining approval from the appropriate Design Professional for use of that part of the document.
5. The electronic contract documents can be used for preparation of shop drawings and as-built drawings only. The information may not be used in whole or in part for any other project.
6. The drawings prepared by IMEG for bidding purposes may not be used directly for ductwork layout drawings or coordination drawings.
7. The use of these CAD documents by the Contractor does not relieve them from their responsibility for coordination of work with other trades and verification of space available for the installation.
8. The information is provided to expedite the project and assist the Contractor with no guarantee by IMEG as to the accuracy or correctness of the information provided. IMEG accepts no responsibility or liability for the Contractor's use of these documents.

G. Field Measurements:

1. Verify all pertinent dimensions at the job site before ordering any conduit, conductors, wireways, bus duct, fittings, etc.

1.8 WEB-BASED PROJECT SOFTWARE

- A. The General Contractor shall provide a web-based project software site for the purpose of hosting and managing project communication and documentation until completion of the warranty phase.
- B. The web-based project software shall include, at a minimum, the following features: construction schedule, submittals, RFIs, ASIs, construction change directives, change orders, drawing management, specification management, payment applications, contract modifications, meeting minutes, construction progress photos.
- C. Provide web-based project software user licenses for use by the Architect/Engineer. Access will be provided from the start of the project through the completion of the warranty phase.
- D. At project completion, provide digital archive of entire project in format that is readable by common desktop software applications in format acceptable to Architect/Engineer. Provide data in locked format to prevent further changes.

1.9 SUBMITTALS

- A. Submittals shall be required for the following items, and for additional items where required elsewhere in the specifications or on the drawings.

1. Submittals list:

Referenced Specification Section	Submittal Item	Coordination Drawing
26 09 33	Lighting Control System	
26 27 26	Wiring Devices	Ceiling mount
26 51 19	LED Lighting	Yes
28 31 00	Fire Alarm and Detection Systems	Yes
Drawings	Photocells, Timeclocks, Relays	

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

B. General Submittal Procedures: In addition to the provisions of Division 1, the following are required:

1. Transmittal: Each transmittal shall include the following:
 - a. Date
 - b. Project title and number
 - c. Contractor's name and address
 - d. Division of work (e.g., electrical, plumbing, heating, ventilating, etc.)
 - e. Description of items submitted and relevant specification number
 - f. Notations of deviations from the contract documents
 - g. Other pertinent data
2. Submittal Cover Sheet: Each submittal shall include a cover sheet containing:
 - a. Date
 - b. Project title and number
 - c. Architect/Engineer
 - d. Contractor and subcontractors' names and addresses
 - e. Supplier and manufacturer's names and addresses
 - f. Division of work (e.g., electrical, plumbing, heating, ventilating, etc.)
 - g. Description of item submitted (using project nomenclature) and relevant specification number
 - h. Notations of deviations from the contract documents
 - i. Other pertinent data
 - j. Provide space for Contractor's review stamps
3. Composition:
 - a. Submittals shall be submitted using specification sections and the project nomenclature for each item.
 - b. Individual submittal packages shall be prepared for items in each specification section. All items within a single specification section shall be packaged together where possible. An individual submittal may contain items from multiple specifications sections if the items are intimately linked (e.g., pumps and motors).
 - c. All sets shall contain an index of the items enclosed with a general topic description on the cover.
4. Content: Submittals shall include all fabrication, erection, layout, and setting drawings; manufacturers' standard drawings; schedules; descriptive literature, catalogs and brochures; performance and test data; wiring and control diagrams; dimensions; shipping and operating weights; shipping splits; service clearances; and all other drawings and descriptive data of materials of construction as may be required to show that the materials, equipment or systems and the location thereof conform to the requirements of the contract documents.
5. Contractor's Approval Stamp:
 - a. The Contractor shall thoroughly review and approve all shop drawings before submitting them to the Architect/Engineer. The Contractor shall stamp, date and sign each submittal certifying it has been reviewed.
 - b. Unstamped submittals will be rejected.
 - c. The Contractor's review shall include, but not be limited to, verification of the following:
 - 1) Only approved manufacturers are used.
 - 2) Addenda items have been incorporated.
 - 3) Catalog numbers and options match those specified.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

- 4) Performance data matches that specified.
 - 5) Electrical characteristics and loads match those specified.
 - 6) Equipment connection locations, sizes, capacities, etc. have been coordinated with other affected trades.
 - 7) Dimensions and service clearances are suitable for the intended location.
 - 8) Equipment dimensions are coordinated with support steel, housekeeping pads, openings, etc.
 - 9) Constructability issues are resolved (e.g., weights and dimensions are suitable for getting the item into the building and into place, sinks fit into countertops, etc.).
- d. The Contractor shall review, stamp and approve all subcontractors' submittals as described above.
- e. The Contractor's approval stamp is required on all submittals. Approval will indicate the Contractor's review of all material and a complete understanding of exactly what is to be furnished. Contractor shall clearly mark all deviations from the contract documents on all submittals. If deviations are not marked by the Contractor, then the item shall be required to meet all drawing and specification requirements.
6. Submittal Identification and Markings:
- a. The Contractor shall clearly mark each item with the same nomenclature applied on the drawings or in the specifications.
 - b. The Contractor shall clearly indicate the size, finish, material, etc.
 - c. Where more than one model is shown on a manufacturer's sheet, the Contractor shall clearly indicate exactly which item and which data is intended.
 - d. All marks and identifications on the submittals shall be unambiguous.
7. Schedule submittals to expedite the project. Coordinate submission of related items.
8. Identify variations from the contract documents and product or system limitations that may be detrimental to the successful performance of the completed work.
9. Reproduction of contract documents alone is not acceptable for submittals.
10. Incomplete submittals will be rejected without review. Partial submittals will only be reviewed with prior approval from the Architect/Engineer.
11. Submittals not required by the contract documents may be returned without review.
12. The Architect/Engineer's responsibility shall be to review one set of shop drawing submittals for each product. If the first submittal is incomplete or does not comply with the drawings and/or specifications, the Contractor shall be responsible to bear the cost for the Architect/Engineer to recheck and handle the additional shop drawing submittals.
13. Submittals shall be reviewed and approved by the Architect/Engineer before releasing any equipment for manufacture or shipment.
14. Contractor's responsibility for errors, omissions or deviation from the contract documents in submittals is not relieved by the Architect/Engineer's approval.
15. Schedule shall allow for adequate time to perform orderly and proper review of submittals, including time for consultants and Owner if required, and resubmittals by Contractor if necessary, and to cause no delay in Work or in activities of Owner or other contractors.
- a. Allow at least two weeks for Architect's/Engineer's review and processing of each submittal, excluding mailing.
16. Architect/Engineer reserves the right to withhold action on a submittal which, in the Architect/Engineer's opinion, requires coordination with other submittals until related submittals are received. The Architect/Engineer will notify the Contractor, in writing, when they exercise this right.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

C. Electronic Submittal Procedures:

1. Distribution: Email submittals as attachments to all parties designated by the Architect/Engineer, unless a web-based submittal program is used.
2. Transmittals: Each submittal shall include an individual electronic letter of transmittal.
3. Format: Electronic submittals shall be in PDF format only. Scanned copies, in PDF format, of paper originals are acceptable. Submittals that are not legible will be rejected. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.
4. File Names: Electronic submittal file names shall include the relevant specification section number followed by a description of the item submitted, as follows. Where possible, include the transmittal as the first page of the PDF instead of using multiple electronic files.
 - a. Submittal file name: 26 XX XX.description.YYYYMMDD
 - b. Transmittal file name: 26 XX XX.description.YYYYMMDD
5. File Size: Files shall be transmitted via a pre-approved method. Larger files may require an alternative transfer method, which shall also be pre-approved.

1.10 SCHEDULE OF VALUES

A. The requirements herein are in addition to the provisions of Division 1.

B. Format:

1. Use AIA Document Continuation Sheets G703 or another similar form approved by the Owner and Architect/Engineer.
2. Submit in Excel format.
3. Support values given with substantiating data.

C. Preparation:

1. Itemize work required by each specification section and list all providers. All work provided by subcontractors and major suppliers shall be listed on the Schedule of Values. List each subcontractor and supplier by company name.
2. Break down all costs into:
 - a. Material: Delivered cost of product with taxes paid.
 - b. Labor: Labor cost, excluding overhead and profit.
3. Itemize the cost for each of the following:
 - a. Overhead and profit.
 - b. Bonds.
 - c. Insurance.
 - d. General Requirements: Itemize all requirements.

D. Update Schedule of Values when:

1. Indicated by Architect/Engineer.
2. Change of subcontractor or supplier occurs.
3. Change of product or equipment occurs.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

1.11 CHANGE ORDERS

- A. A detailed material and labor takeoff shall be prepared for each change order, along with labor rates and markup percentages. Change orders shall be broken down by sheet or associated individual line item indicated in the change associated narrative, whichever provides the most detailed breakdown. Change orders with inadequate breakdown will be rejected.
- B. Itemized pricing with unit cost shall be provided from all distributors and associated subcontractors.
- C. Change order work shall not proceed until authorized.

1.12 PRODUCT DELIVERY, STORAGE, HANDLING and MAINTENANCE

- A. Exercise care in transporting and handling to avoid damage to materials. Store materials on the site to prevent damage.
- B. Protect equipment, components, and openings with airtight covers and exercise care at every stage of storage, handling, and installation of equipment to prevent airborne dust and dirt from entering or fouling equipment to include, but not limited to:
 - 1. Distribution equipment - branch panels, distribution panels, switchboards, motor control centers, etc.
 - 2. Variable frequency drives.
 - 3. Transformers, ventilated.
 - 4. Electronic equipment, UPS, harmonic filters, power factor correction.
 - 5. Lighting luminaires and lighting control systems.
- C. Equipment and components that are visibly damaged or have been subject to environmental conditions prior to building turnover to Owner that could shorten the life of the component (for example, water damage, humidity, dust and debris, excessive hot or cold storage location, etc.) shall be repaired or replaced with new equipment or components without additional cost to the building owner.
- D. Keep all materials clean, dry and free from damaging environments.
- E. Coordinate the installation of heavy and large equipment with the General Contractor and/or Owner. If the Electrical Contractor does not have prior documented experience in rigging and lifting similar equipment, he/she shall contract with a qualified lifting and rigging service that has similar documented experience. Follow all equipment lifting and support guidelines for handling and moving.
- F. Contractor is responsible for moving equipment into the building and/or site. Contractor shall review site prior to bid for path locations and any required building modifications to allow movement of equipment. Contractor shall coordinate the work with other trades.

1.13 NETWORK / INTERNET CONNECTED EQUIPMENT

- A. These specifications may require certain equipment or systems to have network, Internet and/or remote access capability ("Network Capability"). Any requirement for Network Capability shall be interpreted only as a functional capability and is not to be construed as authority to connect or enable any Network Capability. Network Capability may only be connected or enabled with the express written consent of the Owner.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

B. The following network connected equipment shall be equipped with restricted access protocols:

1. Adjustable trip overcurrent protection devices
2. Power monitoring and control
3. Electrical controls
4. Lighting control system
5. Variable frequency drives
6. Package engine generator and remote annunciator
7. Transfer switch and remote annunciator
8. Static uninterruptible power supply (UPS)
9. Fire alarm and automatic detection

1.14 WARRANTY

- A. Provide one-year warranty for all fixtures, equipment, materials, and workmanship.
- B. The warranty period for all work in this specification Division shall commence on the date of Substantial Completion or successful system performance whichever occurs later. The warranty may also commence if a whole or partial system or any separate piece of equipment or component is put into use for the benefit of any party other than the installing contractor with prior written authorization of the Owner. In this instance, the warranty period shall commence on the date when such whole system, partial system or separate piece of equipment or component is placed in operation and accepted in writing by the Owner.
- C. Warranty requirements extend to correction, without cost to the Owner, of all work found to be defective or nonconforming to the contract documents. The Contractor shall bear the cost of correcting all damage due to defects or nonconformance with contract documents excluding repairs required as a result of improper maintenance or operation, or of normal wear as determined by the Architect/Engineer.

1.15 INSURANCE

- A. This Contractor shall maintain insurance coverage as set forth in Division 1 of these specifications.

1.16 MATERIAL SUBSTITUTION

- A. Where several manufacturers' names are given, the manufacturer for which a catalog number is given is the basis for job design and establishes the quality.
- B. Equivalent equipment manufactured by the other listed manufacturers may be used. Contractor shall ensure that all items submitted by these other manufacturers meet all requirements of the drawings and specifications and fits in the allocated space. When using other listed manufacturers, the Contractor shall assume responsibility for any and all modifications necessary (including, but not limited to structural supports, electrical connections and rough-in, and regulatory agency approval, etc.) and coordinate such with other contractors. The Architect/Engineer shall make the final determination of whether a product is equivalent.
- C. Any material, article or equipment of other unnamed manufacturers which will adequately perform the services and duties imposed by the design and is of a quality equal to or better than the material, article or equipment identified by the drawings and specifications may be used if approval is secured in writing from the Architect/Engineer via addendum. The Contractor assumes all costs incurred as a result of using the offered material, article or equipment, on the Contractors part or on the part of other Contractors whose work is affected.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

- D. Voluntary add or deduct prices for alternate materials may be listed on the bid form. These items will not be used in determining the low bidder. This Contractor assumes all costs incurred as a result of using the offered material or equipment on the Contractors part or on the part of other Contractors whose work is affected.
- E. All material substitutions requested after the final addendum must be listed as voluntary changes on the bid form.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All items of material having a similar function (e.g., safety switches, panelboards, switchboards, contactors, motor starters, dry type transformers) shall be of the same manufacturer unless specifically stated otherwise on drawings or elsewhere in specifications.

PART 3 - EXECUTION

3.1 JOBSITE SAFETY

- A. Neither the professional activities of the Architect/Engineer, nor the presence of the Architect/Engineer or the employees and subconsultants at a construction site, shall relieve the Contractor and any other entity of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending or coordinating all portions of the work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The Architect/Engineer and personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Contractor is solely responsible for jobsite safety. The Architect/Engineer and the Architect/Engineer's consultants shall be indemnified and shall be made additional insureds under the Contractor's general liability insurance policy.

3.2 EXCAVATION, FILL, BACKFILL, COMPACTION

A. General:

- 1. Prior to the commencement of any excavation or digging, the Contractor shall verify all underground utilities with the regional utility locator. Provide prior notice to the locator before excavations. Contact information for most regional utility locaters can be found by calling 811.
- 2. The Contractor shall do all excavating, filling, backfilling, compacting, and restoration in connection with the work.

B. Excavation:

- 1. Make all excavations to accurate, solid, undisturbed earth, and to proper dimensions.
- 2. If excavations are carried in error below indicated levels, concrete of same strength as specified for the foundations or thoroughly compacted sand-gravel fill, as determined by the Architect/Engineer shall be placed in such excess excavations under the foundation. Place thoroughly compacted, clean, stable fill in excess excavations under slabs on grade, at the Contractor's expense.
- 3. Trim bottom and sides of excavations to grades required for foundations.
- 4. Protect excavations against frost and freezing.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

5. Take care in excavating not to damage surrounding structures, equipment or buried pipe. Do not undermine footing or foundation.
 6. Perform all trenching in a manner to prevent cave-ins and risk to workmen.
 7. Where original surface is pavement or concrete, the surface shall be saw cut to provide clean edges and assist in the surface restoration.
 8. If satisfactory bearing soil is not found at the indicated levels, immediately notify the Architect/Engineer or their representative, and do no further work until the Architect/Engineer or their representative gives further instructions.
 9. Excavation shall be performed in all ground conditions, including rock, if encountered. Bidders shall visit the premises and determine the soil conditions by actual observations, borings, or other means. The cost of all such inspections, borings, etc., shall be borne by the bidder.
 10. If a trench is excavated in rock, a compacted bed with a depth of 3" (minimum) of sand and gravel shall be used to support the conduit unless masonry cradles or encasements are used.
 11. Mechanical excavation of the trench to line and grade of the conduit or to the bottom level of masonry cradles or encasements is permitted, unless otherwise indicated on the electrical drawings.
 12. Mechanical excavation of the trench to line and grade where direct burial cables are to be installed is permitted provided the excavation is made to a depth to permit installation of the cable on a fine sand bed at least 3 inches deep.
- C. Dewatering:
1. Furnish, install, operate and remove all dewatering pumps and pipes needed to keep trenches and pits free of water.
- D. Underground Obstructions:
1. Known underground piping, conduit, feeders, foundations, and other obstructions in the vicinity of construction are shown on the drawings. Review all Bid Documents for all trades on the project to determine obstructions indicated. Take great care in making installations near underground obstructions.
 2. If objects not shown on the drawings are encountered, remove, relocate, or perform extra work as directed by the Architect/Engineer.
- E. Fill and Backfilling:
1. No rubbish or waste material is permitted for fill or backfill.
 2. Provide all necessary sand and/or CA6 for backfilling.
 3. Native soil materials may be used as backfill if approved by the Geotechnical Engineer.
 4. Dispose of the excess excavated earth as directed.
 5. Backfill materials (native soil material, sand, and/or CA6) shall be suitable for required compaction, clean and free of perishable materials, frozen earth, debris, earth with a high void content, and stones greater than 4 inches in diameter. Water is not permitted to rise in unbackfilled trenches.
 6. Backfill all trenches and excavations immediately after installing of conduit, or removing forms, unless other protection is directed.
 7. Around piers and isolated foundations and structures, backfill and fill shall be placed and consolidated simultaneously on all sides to prevent wedge action and displacement. Spread fill and backfill materials in 6" uniform horizontal layers with each layer compacted separately to required density.
 8. For conduits that are not concrete encased, lay all conduits on a compacted bed of sand at least 3" deep. Backfill around conduits with sand, in 6" layers and compact each layer.
 9. Conduits that are concrete encased or in a ductbank, conduit spacers, and cradles shall be installed on a bed of compacted CA-6 gravel. Refer to conduit section for backfilling and ductbank requirements.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

10. Backfill with native soil material (if approved) or sand up to grade for all conduits under slabs or paved areas. All other conduits shall have sand backfill to 6" above the top of the conduit.
11. Place all backfill above the sand in uniform layers not exceeding 6" deep. Place then carefully and uniformly tamp each layer to eliminate lateral or vertical displacement.
12. Where the fill and backfill will ultimately be under a building, floor or paving, each layer of fill shall be compacted to 95% of the maximum density as determined by AASHTO Designation T-99 or ASTM Designation D-698. Moisture content of soil at time of compaction shall not exceed plus or minus 2% of optimum moisture content as determined by AASHTO T-99 or ASTM D-698 test.
13. After backfilling of trenches, no superficial loads shall be placed on the exposed surface of the backfill until a period of 48 hours has elapsed.

F. Surface Restoration:

1. Where trenches are cut through graded, planted or landscaped areas, the areas shall be restored to the original condition. Replace all planting and landscaping features removed or damaged to its original condition. At least 6" of topsoil shall be applied where disturbed areas are to be seeded or sodded. All lawn areas shall be sodded unless seeding is called out in the drawings or specifications.
2. Concrete or asphalt type pavement, seal coat, rock, gravel or earth surfaces removed or damaged shall be replaced with comparable materials and restored to original condition. Broken edges shall be saw cut and repaired as directed by Architect/Engineer.

3.3 ARCHITECT/ENGINEER OBSERVATION OF WORK

- A. The contractor shall provide seven (7) calendar days' notice to the Architect/Engineer prior to:
1. Placing fill over underground and underslab utilities.
 2. Covering exterior walls, interior partitions and chases.
 3. Installing hard or suspended ceilings and soffits.
- B. The Architect/Engineer will review the installation and provide a written report noting deficiencies requiring correction. The contractor's schedule shall account for these reviews and show them as line items in the approved schedule.

3.4 PROJECT CLOSEOUT

- A. The following paragraphs supplement the requirements of Division 1.
- B. Final Jobsite Observation:
1. To prevent the Final Jobsite Observation from occurring too early, the Contractor shall review the completion status of the project and certify that the job is ready for the final jobsite observation.
 2. Attached to the end of this section is a typical list of items that represent the degree of job completeness expected prior to requesting a review. The Contractor shall sign the attached certification and return it to the Architect/Engineer so that the final observation can be scheduled.
 3. It is understood that if the Architect/Engineer finds the job not ready for the final observation and additional trips and observations are required to bring the project to completion, the cost of the additional time and expenses incurred by the Architect/Engineer will be deducted from the Contractor's final payment.
- C. The following must be submitted before Architect/Engineer recommends final payment:
1. Operation and maintenance manuals with copies of approved shop drawings.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

2. Record documents including marked-up drawings and specifications.
3. A report documenting the instructions given to the Owner's representatives complete with the number of hours spent in the instruction. The report shall bear the signature of an authorized agent of this Contractor and shall be signed by the Owner's representatives.
4. Provide spare parts, maintenance, and extra materials in quantities specified in individual specification sections. Deliver to project site and place in location as directed and submit receipt to Architect/Engineer.
5. Inspection and testing report by the fire alarm system manufacturer.
6. Start-up reports on all equipment requiring a factory installation or start-up.

D. Circuit Directories:

1. Provide custom typed circuit directory for each branch circuit panelboard. Provide updated custom typed circuit directory for each existing branch circuit panelboard with new or revised circuits per the scope of work. Label shall include equipment name or final approved room name, room number, and load type for each circuit (examples: SUMP SP-1 or ROOM 101 RECEIPT). Revise directory to reflect circuit changes required to balance phase loads. Printed copies of the bid document panel schedules are not acceptable as circuit directories.

3.5 OPERATION AND MAINTENANCE MANUALS

A. General:

1. Provide an electronic copy of the O&M manuals as described below for Architect/Engineer's review and approval. The electronic copy shall be corrected as required to address the Architect/Engineer's comments. Once corrected, electronic copies and paper copies shall be distributed as directed by the Architect/Engineer.
2. Approved O&M manuals shall be completed and in the Owner's possession prior to Owner's acceptance and at least 10 days prior to instruction of operating personnel.

B. Electronic Submittal Procedures:

1. Distribution: Email the O&M manual as attachments to all parties designated by the Architect/Engineer.
2. Transmittals: Each submittal shall include an individual electronic letter of transmittal.
3. Format: Electronic submittals shall be in PDF format only. Scanned copies, in PDF format, of paper originals are acceptable. Submittals that are not legible will be rejected. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.
4. File Names: Electronic submittal file names shall include the relevant specification section number followed by a description of the item submitted, as follows. Where possible, include the transmittal as the first page of the PDF instead of using multiple electronic files.
 - a. O&M file name: O&M.div26.contractor.YYYYMMDD
 - b. Transmittal file name: O&Mtransmittal.div26.contractor.YYYYMMDD
5. File Size: Files shall be transmitted via a pre-approved method. Larger files may require an alternative transfer method, which shall also be pre-approved.
6. Provide the Owner with an approved copy of the O&M manual on compact discs (CD), digital video discs (DVD), or flash drives with a permanently affixed label, printed with the title "Operation and Maintenance Instructions", title of the project and subject matter of disc/flash drive when multiple disc/flash drives are required.
7. All text shall be searchable.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

8. Bookmarks shall be used, dividing information first by specification section, then systems, major equipment and finally individual items. All bookmark titles shall include the nomenclature used in the construction documents and shall be an active link to the first page of the section being referenced.

C. Operation and Maintenance Instructions shall include:

1. Title Page: Include title page with project title, Architect, Engineer, Contractor, all subcontractors, and major equipment suppliers, with addresses, telephone numbers, website addresses, email addresses and point of contacts. Website URLs and email addresses shall be active links in the electronic submittal.
2. Table of Contents: Include a table of contents describing specification section, systems, major equipment, and individual items.
3. Copies of all final approved shop drawings and submittals. Include Architect's/Engineer's shop drawing review comments. Insert the individual shop drawing directly after the Operation and Maintenance information for the item(s) in the review form.
4. Copies of all factory inspections and/or equipment startup reports.
5. Copies of warranties.
6. Schematic wiring diagrams of the equipment that have been updated for field conditions. Field wiring shall have label numbers to match drawings.
7. Dimensional drawings of equipment.
8. Detailed parts lists with lists of suppliers.
9. Operating procedures for each system.
10. Maintenance schedule and procedures. Include a chart listing maintenance requirements and frequency.
11. Repair procedures for major components.
12. Replacement parts and service material requirements for each system and the frequency of service required.
13. Instruction books, cards, and manuals furnished with the equipment.
14. Include record drawings of the one-line diagrams for each major system. The graphic for each piece of equipment shown on the one-line diagram shall be an active link to its associated Operation & Maintenance data.
15. Copies of all panel schedules in electronic Microsoft Excel spreadsheet (.xlsx) file. Each panelboard shall be a separate tab in the workbook.

3.6 INSTRUCTING THE OWNER'S REPRESENTATIVE

- A. Adequately instruct the Owner's designated representatives in the maintenance, care, and operation of the complete systems installed under this contract.
- B. Provide verbal and written instructions to the Owner's representatives by FACTORY PERSONNEL in the care, maintenance, and operation of the equipment and systems.
- C. The Owner has the option to make a video recording of all instructions. Coordinate schedule of instructions to facilitate this recording.
- D. The instructions shall include:
 1. Maintenance of equipment.
 2. Start-up procedures for all major equipment.
 3. Description of emergency system operation.
- E. Notify the Architect/Engineer of the time and place for the verbal instructions to be given to the Owner's representative so a representative can be present if desired.
- F. Minimum hours of instruction time for each item and/or system shall be as indicated in each individual specification section.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

G. Operating Instructions:

1. Contractor is responsible for all instructions to the Owner's representatives for the electrical and specialized systems.
2. If the Contractor does not have staff that can adequately provide the required instructions, the Contractor shall include in the bid an adequate amount to reimburse the Owner for the Architect/Engineer to perform these services.

3.7 RECORD DOCUMENTS

- A. The following paragraphs supplement Division 1 requirements.
- B. Maintain at the job site a separate and complete set of electrical drawings and specifications with all changes made to the systems clearly and permanently marked in complete detail.
- C. Mark drawings and specifications to indicate approved substitutions; Change Orders, and actual equipment and materials used. All Change Orders, RFI responses, Clarifications and other supplemental instructions shall be marked on the documents. Record documents that merely reference the existence of the above items are not acceptable. Should this Contractor fail to complete Record Documents as required by this contract, this Contractor shall reimburse Architect/Engineer for all costs to develop record documents that comply with this requirement. Reimbursement shall be made at the Architect/Engineer's hourly rates in effect at the time of work.
- D. Record changes daily and keep the marked drawings available for the Architect/Engineer's examination at any normal work time.
- E. Upon completing the job, and before final payment is made, give the marked-up drawings to the Architect/Engineer.
- F. Record actual routing of conduits exceeding 2 inches.

3.8 PAINTING

- A. Paint all equipment that is marred or damaged prior to the Owner's acceptance. Paint and color shall match original equipment paint and shall be obtained from the equipment supplier if available. All equipment shall have a finished coat of paint applied unless specifically allowed to be provided with a prime coat only.
- B. Equipment in finished areas that will be painted to match the room decor will be painted by others. Should this Contractor install equipment in a finished area after the area has been painted, the Contractor shall have the equipment and all its supports, hangers, etc., painted to match the room decor. Painting shall be performed as described in project specifications.
- C. Equipment cabinets, casings, covers, metal jackets, etc., located in equipment rooms or concealed spaces, shall be furnished in standard finish, free from scratches, abrasions, chippings, etc.
- D. Equipment in occupied spaces, or if standard to the unit, shall have a baked primer with baked enamel finish coat free from scratches, abrasions, chipping, etc. If color option is specified or is standard to the unit, verify with the Architect the color preference before ordering.

3.9 ADJUST AND CLEAN

- A. Thoroughly clean all equipment and systems prior to the Owner's final acceptance of the project.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

- B. Clean all foreign paint, grease, oil, dirt, labels, stickers, etc. from all equipment.
- C. Remove all rubbish, debris, etc., accumulated during construction from the premises.

3.10 SPECIAL REQUIREMENTS

- A. Coordinate the installation of all equipment, controls, devices, etc., with other trades to maintain clear access area for servicing.
- B. Install all equipment to maximize access to parts needing service or maintenance. Review the final location, placement, and orientation of equipment with the Owner's representative prior to setting equipment.
- C. Installation of equipment or devices without regard to coordination of access requirements and confirmation with the Owner's representative will result in removal and reinstallation of the equipment at the Contractor's expense.
- D. Raceway and Cable Routing Restrictions: Raceways and cable are restricted from being routed in the following locations, unless serving the space or permitted by the authority having jurisdiction.
 - 1. Elevator machine rooms and hoistways.
 - 2. Exit enclosures.
 - 3. Other areas restricted by code.
 - 4. Technology, data, server rooms.
 - 5. Fire pump and sprinkler rooms.
 - 6. Normal power in emergency power equipment rooms: Limited to feeders and branch circuits serving the emergency power equipment located in the room.
 - 7. Emergency power in normal power equipment rooms: Limited to feeders and branch circuits serving the normal power equipment located in the room.

3.11 INDOOR AIR QUALITY (IAQ) MAINTENANCE FOR OCCUPIED FACILITIES UNDER CONSTRUCTION

- A. Contractors shall make all reasonable efforts to prevent construction activities from affecting the air quality of the occupied areas of the building or outdoor areas near the building. These measures shall include, but not be limited to:
 - 1. General Contractor shall erect and maintain dust barriers throughout the construction work. These barriers shall be reasonably airtight and shall prevent entry into the construction zone by unauthorized persons. Reasonably airtight means construction equivalent to full-height temporary or permanent walls with joints taped or sealed, and shafts and other penetrations sealed as well as possible. Fire resistant polyethylene is acceptable; if flame spread/smoke developed ratings are demonstrated to conform to the applicable building codes and licensing acts.
 - 2. All contractors shall endeavor to minimize the amount of contaminants generated during construction. Methods to be employed shall include, but not be limited to:
 - a. Minimizing the amount of dust generated.
 - b. Reducing solvent fumes and VOC emissions.
 - c. Maintain good housekeeping practices, including sweeping and periodic dust and debris removal. There should be no visible haze in the air.
 - 3. Request that the Owner designate an IAQ representative.
 - 4. Review and receive approval from the Owner's IAQ representative for all IAQ-related construction activities and negative pressure containment plans.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

5. Inform the IAQ representative of all conditions that could adversely impact IAQ, including operations that will produce higher than normal dust production or odors.
6. Schedule activities that may cause IAQ conditions that are not acceptable to the Owner's IAQ representative during unoccupied periods.
7. Request copies of and follow all Owner's IAQ and infection control policies.
8. Unless no other access is possible, the entrance to construction site shall not be through the existing facility.
9. To minimize growth of infectious organisms, do not permit damp areas in or near the construction area to remain for over 24 hours.
10. In addition to the criteria above, provide measures as recommended in the SMACNA "IAQ Guidelines for Occupied Buildings under Construction".

3.12 SYSTEM STARTING AND ADJUSTING

- A. The electrical systems shall be complete and operating. System startup, testing, adjusting, and balancing to obtain satisfactory system performance is the responsibility of the Contractor. This includes all calibration and adjustment of electrical controls, balancing of loads, troubleshooting and verification of software, and final adjustments that may be needed.
- B. Complete all manufacturer-recommended startup procedures and checklists to verify proper equipment operation and does not pose a danger to personnel or property.
- C. All operating conditions and control sequences shall be tested during the start-up period. Testing all interlocks, safety shut-downs, controls, and alarms.
- D. The Contractor, subcontractors, and equipment suppliers shall have skilled technicians to ensure that all systems perform properly. If the Architect/Engineer is requested to visit the job site for trouble shooting, assisting in start-up, obtaining satisfactory equipment operation, resolving installation and/or workmanship problems, equipment substitution issues or unsatisfactory system performance, including call backs during the warranty period, through no fault of the design; the Contractor shall reimburse the Owner on a time and materials basis for services rendered at the Architect/Engineer's standard hourly rates in effect when the services are requested. The Contractor shall pay the Owner for services required that are product, installation or workmanship related. Payment is due within 30 days after services are rendered.

3.13 FIELD QUALITY CONTROL

- A. General:
 1. Conduct all tests required during and after construction. Submit test results in NETA format, or equivalent form, that shows the test equipment used, calibration date, tester's name, ambient test conditions, humidity, conductor length, and results corrected to 40°C.
 2. Supply necessary instruments, meters, etc., for the tests. Supply competent technicians with training in the proper testing techniques.
 3. All cables and wires shall be tested for shorts and grounds following installation and connection to devices. Replace shorted or grounded wires and cables.
 4. Any wiring device, electrical apparatus or luminaire, if grounded or shorted on any integral "live" part, shall have all defective parts or materials replaced.
 5. Test cable insulation of service and panel feeder conductors for proper insulation values. Tests shall include the cable, all splices, and all terminations. Each conductor shall be tested and shall test free of short circuits and grounds and have an insulation value not less than Electrical Code Standards. Take readings between conductors, and between conductors and ground.
 6. If the results obtained in the tests are not satisfactory, make adjustments, replacements, and changes as needed. Then repeat the tests, and make additional tests, as the Architect/Engineer or authority having jurisdiction deems necessary.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

- B. Other Equipment:
 - 1. Give other equipment furnished and installed by the Contractor all standard tests normally made to assure that the equipment is electrically sound, all connections properly made, phase rotation correct, fuses and thermal elements suitable for protection against overloads, voltage complies with equipment nameplate rating, and full load amperes are within equipment rating.
- C. If any test results are not satisfactory, make adjustments, replacements and changes as needed and repeat the tests and make additional tests as the Architect/Engineer or authority having jurisdiction deem necessary.

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

READINESS CERTIFICATION PRIOR TO FINAL JOBSITE OBSERVATION

To prevent the final job observation from occurring too early, we require that the Contractor review the completion status of the project and, by copy of this document, certify that the job is indeed ready for the final job observation. The following is a typical list of items that represent the degree of job completeness expected prior to your requesting a final job observation.

1. Penetrations of fire-rated construction fire sealed in accordance with specifications.
2. Electrical panels have typed circuit identification.
3. Operation and Maintenance manuals have been submitted as per Section 26 05 00.
4. Bound copies of approved shop drawings have been submitted as per Section 26 05 00.
5. Report of instruction of Owner's representative has been submitted as per Section 26 05 00.
6. Fire alarm inspection and testing report has been submitted as per Sections 26 05 00 and 28 31 00.
7. Start-up reports from factory representative have been submitted as per Section 26 05 00.

Accepted by:

Prime Contractor _____

By _____ Date _____

Upon Contractor certification that the project is complete and ready for a final job observation, we require the Contractor to sign this agreement and return it to the Architect/Engineer so that the final observation can be scheduled.

It is understood that if the Architect/Engineer finds the job not ready for the final observation and that additional trips and observations are required to bring the project to completion, the costs incurred by the Architect/Engineers for additional time and expenses will be deducted from the Contractor's contract retainage prior to final payment at the completion of the job.

END OF SECTION 260500

SECTION 26 05 05
ELECTRICAL DEMOLITION FOR REMODELING

SECTION 26 05 05 - ELECTRICAL DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Electrical demolition

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work shall be as specified in individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. THE DRAWINGS ARE INTENDED TO INDICATE THE SCOPE OF WORK REQUIRED AND DO NOT INDICATE EVERY BOX, CONDUIT, OR WIRE THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID AND VERIFY EXISTING CONDITIONS.
- B. Where walls, ceilings, structures, etc., are indicated as being removed on general or electrical drawings, the Contractor shall be responsible for the removal of all electrical equipment, devices, fixtures, raceways, wiring, systems, etc., from the removed area.
- C. Where ceilings, walls, structures, etc., are temporarily removed and replaced by others, this Contractor shall be responsible for the removal, storage, and replacement of equipment, devices, fixtures, raceways, wiring, systems, etc.
- D. Where mechanical or technology equipment is indicated as being removed on electrical, mechanical, or technology drawings, the Contractor shall be responsible for disconnecting the equipment and removing all starters, VFD, controllers, electrical equipment, raceways, wiring, etc. associated with the device.
- E. Verify that abandoned wiring and equipment serve only abandoned equipment or facilities. Extend conduit and wire to facilities and equipment that will remain in operation following demolition. Extension of conduit and wire to equipment shall be compatible with the surrounding area. Extended conduit and conductors to match existing size and material.
- F. Coordinate scope of work with all other Contractors and the Owner at the project site. Schedule removal of equipment and electrical service to avoid conflicts.
- G. Bid submittal shall mean the Contractor has visited the project site and has verified existing conditions and scope of work.

3.2 PREPARATION

- A. The Contractor shall obtain approval from the Owner before turning off power to circuits, feeders, panels, etc. Coordinate all outages with Owner.

SECTION 26 05 05
ELECTRICAL DEMOLITION FOR REMODELING

- B. Coordinate utility service outages with Utility Company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations. Assume all equipment and systems must remain operational unless specifically noted otherwise on drawings.
- D. Disconnect electrical systems in walls, floors, structures, and ceilings scheduled for removal.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Demolish and extend existing electrical work under provisions of Division 1 of Specifications and this Section.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Remove abandoned wiring and raceway to source of supply. Existing conduit in good condition may be reused in place by including an equipment ground conductor in reused conduit. Reused conduit and boxes shall have supports revised to meet current codes. Relocating conduit shall not be allowed.
- D. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces. Remove all associated clamps, hangers, supports, etc. associated with raceway removal.
- E. Disconnect and remove outlets and devices that are to be demolished. Remove outlet or devices' associated back box, supports, and conduit and conductors back to source. Patch opening created from removal of device to match surrounding finishes.
- F. Disconnect and remove abandoned panelboards and distribution equipment.
- G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories. Ballasts in light fixtures installed prior to 1980 shall be incinerated in EPA approved incinerator or disposed of in EPA certified containers and deposited in an EPA landfill certified for PCB disposal or recycled by permitted ballast recycler. Punctured or leaking ballasts must be disposed of according to Federal Regulations under the Toxic Substance Control Act. Provide Owner and Architect/Engineer with a Certificate of Destruction to verify proper disposal.
- I. Repair adjacent construction and finishes damaged during demolition and extension work. Patch openings to match existing surrounding finishes.
- J. Maintain access to existing electrical installations that remain active. Modify installation or provide junction boxes and access panel as appropriate.
- K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified. Extended conduit and conductors to match existing size and material.
- L. HID and fluorescent lamps, determined by the Toxicity Characteristic Leachate procedure (TCLP), to be hazardous waste shall be disposed of in an EPA-permitted hazardous waste disposal facility or by a permitted lamp recycler.

SECTION 26 05 05
ELECTRICAL DEMOLITION FOR REMODELING

- M. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- N. This Contractor is responsible for all costs incurred in repair, relocations, or replacement of any cables, conduits, or other services if damaged without proper investigation.

3.4 EXISTING ENCLOSURES - NEW EQUIPMENT

- A. Existing enclosures may be reused to house new equipment including branch panels, industrial controls, and similar systems pending documented verification of the following provided with the applicable new equipment submittals.
 - 1. New equipment or panelboard is listed for the existing enclosure or application.
 - 2. Existing enclosure and new equipment is field evaluated by the manufacturer or nationally recognized testing laboratory for the available fault current, condition, and application.
 - 3. Authority Having Jurisdiction (AHJ) approval.

3.5 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment that remain or are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.
- C. ELECTRICAL ITEMS (E.G., LIGHTING FIXTURES, RECEPTACLES, SWITCHES, CONDUIT, WIRE, ETC.) REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE OWNER IN A LOCATION COORDINATED WITH THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF MATERIAL THE OWNER DOES NOT WANT.

3.6 INSTALLATION

- A. Install relocated materials and equipment under the provisions of Division 1 of Specifications.

END OF SECTION 260505

SECTION 26 05 13 WIRE AND CABLE

SECTION 26 05 13 - WIRE AND CABLE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Building wire
- B. Cabling for remote control, signal, and power limited circuits
- C. Metal-clad cable (MC)

1.2 RELATED WORK

- A. Section 26 05 53 - Electrical Identification: Refer to electrical identification for color and identification labeling requirements.

1.3 REFERENCES

- A. NEMA WC 70 - Power Cables Rated 2,000V or Less for the Distribution of Electrical Energy
- B. NFPA 70 - National Electrical Code (NEC)
- C. UL 44 - Thermoset-Insulated Wires and Cables
- D. UL 83 - Thermoplastic-Insulated Wires and Cables
- E. UL 1581 - Standard for Electrical Wires, Cables, and Flexible Cords

PART 2 - PRODUCTS

2.1 BUILDING WIRE

- A. Feeders and Branch Circuits 8 AWG and larger: Copper, stranded conductor, 600-volt insulation, THHN/THWN or XHHW-2.
- B. Feeders and Branch Circuits 8 AWG and larger in Underground Conduit: Copper, stranded conductor, 600-volt insulation, THWN or XHHW-2.
- C. Feeders and Branch Circuits 10 AWG and Smaller: Copper, solid or stranded conductor, 600-volt insulation, THHN/THWN, unless otherwise noted on the drawings.
- D. Control Circuits: Copper, stranded conductor 600-volt insulation, THHN/THWN.
- E. Each 120 and 277-volt branch circuit shall have a dedicated neutral conductor. Neutral conductors shall be considered current-carrying conductors for wire derating.

SECTION 26 05 13 WIRE AND CABLE

2.2 CABLING FOR REMOTE CONTROL, SIGNAL, AND POWER LIMITED CIRCUITS

- A. Wire for the following specialized systems shall be as designated on the drawings, or elsewhere in these specifications. If not designated on the drawings or specifications, the system manufacturer's recommendations shall be followed.
 - 1. Fire alarm
 - 2. Low voltage switching and lighting control
 - 3. Other specialized cabling, signal, and power limited cabling. Refer to the appropriate Division 23, 27, or 28 requirements; including, but not limited, to the following:
 - a. Building Automation Systems and Controls, Division 23.
- B. Control Cable for Class 1 Remote Control and Signal Circuits: Copper conductor, 600-volt insulation, rated 60°C, individual conductors twisted together, shielded, and covered with a PVC jacket.
- C. Control Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300-volt insulation, rated 60°C, individual conductors twisted together, shielded, and covered with a PVC jacket; UL listed.
- D. Plenum Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300-volt insulation, rated 60°C, individual conductors twisted together, shielded, and covered with a nonmetallic jacket; UL listed for use in air handling ducts, hollow spaces used as ducts, and plenums.

2.3 METAL-CLAD CABLE (MC)

- A. Conductors shall be copper, 600-volt insulation, THHN. Metal clad cable shall be constructed in strict accordance with Underwriters Laboratories, Inc. Standard for Metal-Clad Cables, UL 15694, exterior of metal interlocked armor.
- B. Minimum conductor size for branch circuit wiring shall be 12 AWG, with larger wires used where specified.
- C. Metal-clad cable shall ONLY be used for light fixture whips.

PART 3 - EXECUTION

3.1 WIRE AND CABLE INSTALLATION SCHEDULE

- A. Above Accessible Ceilings:
 - 1. Building wire shall be installed in raceway.
 - 2. Metal clad cable, Type MC, 1/2" size with minimum #12 conductors and ground, shall be allowed for flexible whips to individual luminaires on non-essential circuits. The flexible whips shall be between 18" to 72" in length per Electrical Code.
- B. All Other Locations: Building wire in raceway.
- C. Above Grade: All conductors installed above grade shall be type "THHN".
- D. Underground or In Slab: All conductors shall be type "THWN".

SECTION 26 05 13 WIRE AND CABLE

- E. Low Voltage Cable (less than 100 volts): Low voltage cables in ducts, plenums, and other air handling spaces shall be plenum listed. Low voltage cables in non-accessible areas shall be installed in conduit. Low voltage cable may be installed without conduit in accessible areas using the following types of cable supports. Cable support types/systems shall comply with the warranty requirements of the low voltage cable manufacturer.

- F. Low Voltage Cable (less than 100 volts): Low voltage cable shall be installed in raceway.

3.2 CONTRACTOR CHANGES

- A. The basis of design is copper conductors installed in raceway based on ambient temperature of 30°C, NEC Table 310.16 (2011 - 2017 edition 310.15(B)(16)). The Contractor shall be responsible for derating and sizing conductors and conduits to equal or exceed the ampacity of the basis of design circuits, if he/she chooses to use methods or materials other than the basis of design.
- B. Conductor length(s) listed on plans and schedules. The drawings are diagrammatic with intent to convey the components of the electrical distribution system. Conductor length(s) when listed on plans and schedules are for engineering calculation purposes. Conductor length(s) shall NOT be used for bidding purposes.
- C. Record drawing shall include the calculations and sketches.

3.3 GENERAL WIRING METHODS

- A. Use no wire smaller than 12 AWG for power and lighting circuits, and no smaller than 14 AWG for control wiring.
- B. Use no wire smaller than 18 AWG for low voltage control wiring below 100 volts.
- C. Use 10 AWG conductor for 20 ampere, 120-volt branch circuit home runs longer than 75 feet, and for 20 ampere, 277-volt branch circuit home runs longer than 200 feet.
- D. Use no wire smaller than 8 AWG for outdoor lighting circuits.
- E. The ampacity of multiple conductors in one conduit shall be derated per the Electrical Code. In no case shall more than 4 conductors be installed in one conduit to such loads as motors larger than 1/4 HP, panelboards, motor control centers, etc.
- F. Where installing parallel feeders, place an equal number of conductors for each phase of a circuit in same raceway or cable.
- G. Splice only in junction or outlet boxes.
- H. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- I. Make conductor lengths for parallel circuits equal.
- J. All conductors shall be continuous in conduit from last outlet to their termination.
- K. Terminate all spare conductors on terminal blocks, and label the spare conductors.
- L. Cables or wires shall not be laid out on the ground before pulling.
- M. Cables or wires shall not be dragged over earth or paving.

SECTION 26 05 13 WIRE AND CABLE

- N. Care shall be taken so as not to subject the cable or wire to high mechanical stresses that would cause damage to the wire and cable.
- O. At least six (6)-inch loops or ends shall be left at each outlet for installation connection of luminaires or other devices.
- P. All wires in outlet boxes not connected to fixtures or other devices shall be rolled up, spliced if continuity of circuit is required, and insulated.

3.4 WIRING INSTALLATION IN RACEWAYS

- A. Pull all conductors into a raceway at the same time. Use UL listed wire pulling lubricant for pulling 4 AWG and larger wires.
- B. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.
- C. Pulling shall be continuous without unnecessary stops and starts with wire or cable only partially through raceway.
- D. Where reels of cable or wire are used, they shall be set up on jacks close to the point where the wire or cable enters the conduit or duct so that the cable or wire may be unreeled and run into the conduit or duct with a minimum of change in the direction of the bend.
- E. Conductors shall not be pulled through conduits until plastering or masonry work is completed and conduits are free from moisture. Care shall be taken so that long pulls of wire or pulls around several bends are not made where the wire may be permanently stretched and the insulation damaged.
- F. Only nylon rope shall be permitted to pull cables into conduit and ducts.
- G. Completely and thoroughly swab raceway system before installing conductors.

3.5 CABLE INSTALLATION

- A. Provide protection for exposed cables where subject to damage.
- B. Use suitable cable fittings and connectors.
- C. Run all open cable parallel or perpendicular to walls, ceilings, and exposed structural members. Follow the routing as illustrated on the drawings as closely as possible. Cable routing on drawings scaled 1/4"=1'-0" or less shall be considered diagrammatical, unless noted otherwise. The correct routing, when shown diagrammatically, shall be chosen by the Contractor based on information in the contract documents; in accordance with the manufacturer's written instructions, applicable codes, the NECA's "Standard of Installation", recognized industry standards; and coordinated with other contractors.
- D. Open cable shall be supported by the appropriate size J-hooks or other means if called for on the drawings. Wire and cable from different systems shall not be installed in the same J-hook. J-hooks shall be sized with 20% spare capacity. J-hooks shall provide proper bend radius support for data cable and fiber cables.
- E. Open cable installed above suspended ceilings shall not rest on the suspended ceiling construction, nor utilize the ceiling support system for wire and cable support.

SECTION 26 05 13 WIRE AND CABLE

- F. J-hook support spans shall be based on the smaller of the manufacturer's load ratings and code requirements. In no case shall horizontal spans exceed 5 feet and vertical spans exceed 4 feet. All J-hooks shall be installed where completely accessible and not blocked by piping, ductwork, inaccessible ceilings, etc. J-hooks shall be independently rigidly attached to a structural element. J-hooks shall be installed to provide 2" horizontal separation and 6" vertical separation between systems.
- G. Open cable shall only be installed where specifically shown on the drawings, or permitted in these specifications.

3.6 WIRING CONNECTIONS AND TERMINATIONS

- A. Splice and tap only in accessible junction boxes.
- B. Use solderless, tin-plated copper, compression terminals (lugs) applied with circumferential crimp for conductor terminations, 8 AWG and larger.
- C. Use solderless, tin-plated, compression terminals (lugs) applied with indenter crimp for copper conductor terminations, 10 AWG and smaller.
- D. Use solderless pressure connectors with insulating covers for copper wire splices and taps, 8 AWG and smaller. For 10 AWG and smaller, use insulated spring wire connectors with plastic caps.
- E. Use compression connectors applied with circumferential crimp for conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor. Cold shrink connector insulator with 1kV rating shall be used in damp and wet locations.
- F. Thoroughly clean wires before installing lugs and connectors.
- G. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.
- H. Phase Sequence: All apparatus shall be connected to operate in the phase sequence A-B-C representing the time sequence in which the phase conductors so identified reach positive maximum voltage.
- I. As a general rule, applicable to switches, circuit breakers, starters, panelboards, switchgear and the like, the connections to phase conductors are intended thus:
 - 1. Facing the front and operating side of the equipment, the phase identification shall be:
 - a. Left to Right - A-B-C
 - b. Top to Bottom - A-B-C
- J. Connection revisions as required to achieve correct rotation of motors shall be made at the load terminals of the starters or disconnect switches.
- K. Use antioxidant joint compound on all aluminum conductor terminations. Apply antioxidant joint compound per manufacturer's recommendations.

3.7 MC CABLE INSTALLATION

- A. Cable shall be supported by an approved means every 4.5' and within 12" of outlet boxes, junction boxes, cabinets, or fittings.

SECTION 26 05 13
WIRE AND CABLE

- B. Cable may be unsupported in the following conditions:
 - 1. Cable is no longer than 2' in length at terminals where flexibility is necessary.
 - 2. Cable is not more than 4.5' from the last point of support for connections within an accessible ceiling to light fixtures or equipment.
- C. Conductor ampacity shall be derated as required by the Electrical Code where more than three current carrying conductors are used.
- D. Each 120 and 277-volt circuit shall have a dedicated neutral conductor. Neutral conductors shall be considered current-carrying conductors for cable derating.
- E. Cables shall be cut using a rotary cutter as recommended by the manufacturer to eliminate nicking and cutting of the conductors.
- F. Bending radius shall comply with the requirements listed in the Electrical Code for the type and size of cable being installed, but shall not be less than 5-times the diameter of the cable in any case.
- G. At cable terminations, a fitting shall be provided to protect wires from abrasion, unless the design of the outlet boxes or fittings is such as to afford equivalent protection, and, in addition, an insulating bushing or its equivalent protection shall be provided between the conductors and the armor.

3.8 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Division 1.
- B. Building Wire and Power Cable Testing: Perform an insulation-resistance test on each conductor with respect to ground and adjacent conductors. Test shall be made by means of a low-resistance ohmmeter, such as a "Megger". The applied potential shall be 500 volts dc for 300 volt rated cable and 1000 volts dc for 600 volt rated cable. The test duration shall be one minute. Insulation resistance must be greater than 100 mega-ohm for 600 volt and 25 mega-ohm for 300 volt rated cables per NETA Acceptance Testing Standard. Verify uniform resistance of parallel conductors.
- C. Inspect wire and cable for physical damage and proper connection.
- D. Torque test conductor connections and terminations to manufacturer's recommended values.
- E. Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.
- F. Documentation indicating that the torque wrench has been calibrated not more than 30 days prior to tightening of lugs shall be provided.
- G. Protection of wire and cable from foreign materials:
 - 1. It is the Contractor's responsibility to provide adequate physical protection to prevent foreign material application or contact with any wire or cable type. Foreign material is defined as any material that would negatively impact the validity of the manufacturer's performance warranty. This includes, but is not limited to, overspray of paint (accidental or otherwise), drywall compound, or any other surface chemical, liquid, or compound that could come in contact with the cable, cable jacket, or cable termination components.

SECTION 26 05 13
WIRE AND CABLE

- H. Overspray of paint on any wire or cable will not be accepted. It shall be the Contractor's responsibility to replace any component containing overspray, in its entirety, at no additional cost to the project. Cleaning of the cables with harsh chemicals is not allowed.

END OF SECTION 260513

SECTION 26 05 26
GROUNDING AND BONDING

SECTION 26 05 26 - GROUNDING AND BONDING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Equipment grounding system
- B. Bonding system

1.2 QUALITY ASSURANCE

- A. Comply with UL 467 Grounding and Bonding Equipment.

1.3 REFERENCES

- A. NFPA 70 - National Electrical Code (NEC)

1.4 SUMMARY

- A. This section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

PART 2 - PRODUCTS

2.1 GROUNDING CONDUCTORS

- A. For insulated conductors, comply with Division 26 Section 26 05 13 "Wire and Cable".
- B. Material: Copper.
- C. Equipment Grounding Conductors: Insulated. Refer to Section 26 05 53 for insulation color.

2.2 CONNECTOR PRODUCTS

- A. Comply with UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.
- B. Connectors: Hydraulic compression type, in kit form, and selected per manufacturer's written instructions.
- C. Bolted Connectors: Bolted-pressure-type connectors.

SECTION 26 05 26
GROUNDING AND BONDING

PART 3 - EXECUTION

3.1 CONNECTIONS

- A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
 - 1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
 - 2. Make connections with clean, bare metal at points of contact.
 - 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
 - 4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
 - 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- B. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.
- C. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.
- D. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically non-continuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.
- E. Connections at back boxes, junction boxes, pull boxes, and equipment terminations: The equipment grounding conductor(s) associated with all circuits in the box shall be connected together and to the box using a suitable grounding screw. The removal of the respective receptacle, luminaire, or other device served by the box shall not interrupt the grounding continuity.
- F. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.
- G. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.2 INSTALLATION

- A. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.
- B. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage. Each grounding conductor that passes through a below grade wall must be provided with a waterstop.

SECTION 26 05 26
GROUNDING AND BONDING

- C. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then use a bolted clamp. Bond straps directly to the basic structure, taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

- D. In raceways, use insulated equipment grounding conductors.

3.3 EQUIPMENT GROUNDING SYSTEM

- A. Comply with Electrical Code, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by Electrical Code are indicated.
- B. Install equipment grounding conductors in all feeders and circuits. Terminate each end on a grounding lug or bus.

3.4 FIELD QUALITY CONTROL

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

3.5 GRADING AND PLANTING

- A. Restore surface features, including vegetation, at areas disturbed by Work of this Section. Reestablish original grades, unless otherwise indicated. If sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition. Include application of topsoil, fertilizer, lime, seed, sod, sprig, and mulch. Comply with Division 2. Maintain restored surfaces. Restore disturbed paving.

END OF SECTION 260526

SECTION 26 05 27 SUPPORTING DEVICES

SECTION 26 05 27 - SUPPORTING DEVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Conduit and Equipment Supports
- B. Fastening Hardware

1.2 QUALITY ASSURANCE

- A. Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

1.3 REFERENCES

- A. UL 62275 - Cable Management Systems - Cables Ties for Electrical Installations

1.4 COORDINATION

- A. Coordinate size, shape and location of concrete pads with section on Cast-in-Place Concrete or Concrete Topping.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Allied Support Systems
- B. Cooper B-Line
- C. Erico, Inc.
- D. Hilti
- E. Power Fasteners
- F. Orbit Industries

2.2 MATERIAL

- A. Support Channel: Hot-dip galvanized for wet/damp locations; painted steel for interior/dry locations. All field cut ends shall be touched up with matching finish to inhibit rusting.
- B. Hardware: Corrosion resistant.

SECTION 26 05 27 SUPPORTING DEVICES

C. Anchorage and Structural Attachment Components:

1. Strength: Defined in reports by ICBO Evaluation Service or another agency acceptable to Authorities Having Jurisdiction.
 - a. Structural Safety Factor: Strength in tension and shear of components used shall be at least two times the maximum seismic forces to which they will be subjected.
2. Through Bolts: Structural type, hex head, high strength. Comply with ASTM A 325.
3. Welding Lugs: Comply with MSS-SP-69, Type 57.
4. Beam clamps for Steel Beams and Joists: Double sided or concentric open web joist hangers. Single-sided type is not acceptable.
5. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for seismically rated rigid equipment mountings, and matched to the type and size of attachment devices used.
6. Concrete Anchors: Fasten to concrete using cast-in or post-installed anchors designed per the requirements of Appendix D of ACI 318-05. Post-installed anchors shall be qualified for use in cracked concrete by ACI-355.2.
7. Masonry Anchors: Fasten to concrete masonry units with expansion anchors or self-tapping masonry screws. For expansion anchors into hollow concrete block, use sleeve-type anchors designed for the specific application. Do not fasten in masonry joints. Do not use powder actuated fasteners, wooden plugs, or plastic inserts.

D. Conduit Sleeves and Lintels:

1. Each Contractor shall provide, to the General Contractor for installation, lintels for all openings required for the Contractor's work in masonry walls and conduit sleeves for floors, unless specifically shown as being by others.
2. Refer to Structural plans and specifications for lintel requirements and sizes.
3. Fabricate all lintels from structural steel shapes or as indicated on the drawings. All lintels and grouped wall openings shall be approved by the Architect or Structural Engineer.
4. Fabricate all sleeves from standard weight black steel pipe. Provide continuous sleeve. Cut or split sleeves are not acceptable. Sleeves through concrete walls may be high density polyethylene pipe penetration sleeve with a water stop collar, suitable for use with Link-Seal mechanical seals. Century-Line Model CS.
5. Sleeves through the floors on exposed risers shall be flush with the ceiling, with planed squared ends extending 1" above the floor in unfinished areas, and flush with the floor in finished areas, to accept spring closing floor plates.
6. Sleeves shall not penetrate structural members without approval from the Structural Engineer.
7. Openings through unexcavated floors and/or foundation walls below the floor shall have a smooth finish with sufficient annular space around material passing through opening so slight settling will not place stress on the material or building structure.
8. Install all sleeves concentric with conduits. Secure sleeves in concrete to wood forms. This Contractor is responsible for sleeves dislodged or moved when pouring concrete.
9. Where conduits rise through concrete floors that are on earthen grade, provide 3/4" resilient expansion joint material (asphalt and cork) wrapped around the pipe, the full depth of concrete, at the point of penetration. Secure to prevent shifting during concrete placement and finishing.
10. Size sleeves large enough to allow expansion and contraction movement.

E. Cable Ties for Cable Management Systems:

1. Cables ties, UL Listed, Type 21 or Type 21S, and test to UL Standard 62275 for Cable Management Systems.

SECTION 26 05 27 SUPPORTING DEVICES

2. Acceptable Applications: Low Voltage Wire and Cabling.
 - a. Bundle wires and cables within cable trays, auxiliary gutters, and similar applications.
 - b. Organize and support wiring and cables within equipment and distribution systems.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using expansion anchors in concrete and beam clamps on structural steel.
- B. Trapeze support installation: Cut hanger rods back at trapeze supports so they do not extend more than 3/4" below bottom face of lowest fastener and blunt any sharp edges.
- C. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.
- D. Do not fasten supports to ceiling systems, piping, ductwork, mechanical equipment, or conduit, unless otherwise noted.
- E. Do not use powder-actuated anchors without specific permission.
- F. Do not drill structural steel members.
- G. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.
- H. In wet locations and on all building floors below exterior earth grade install free-standing electrical equipment on concrete pads.
- I. Install cabinets and panelboards with minimum of four anchors. Provide horizontal backing/support framing in stud walls for rigid mounting.
- J. Bridge studs top and bottom with channels to support flush-mounted cabinets and panelboards in stud walls.
- K. Do not exceed 25 lbs. per hanger and a minimum spacing of 2'-0" on center when attaching to metal roof decking (excludes concrete on metal deck). This 25 lbs. load and 2'-0" spacing include adjacent electrical and mechanical items hanging from deck. If the hanger restrictions cannot be achieved, supplemental framing off steel framing will need to be added.
- L. Refer to Section 26 05 33 for special conduit supporting requirements.

3.2 FINISH

- A. Prime coat exposed steel hangers and supports. Hangers and supports in crawl spaces, pipe shafts, and above suspended ceiling spaces are not considered exposed.

SECTION 26 05 27
SUPPORTING DEVICES

- B. Trim all ends of exposed field fabricated steel hangers, slotted channel and threaded rod to within 1" of support or fastener to eliminate potential injury to personnel unless shown otherwise on the drawings. Smooth ends and install elastomeric insulation with two coats of latex paint if exposed steel is within 6'-6" of finish floor and presents potential injury to personnel.

END OF SECTION 260527

SECTION 26 05 33
CONDUIT AND BOXES

SECTION 26 05 33 - CONDUIT AND BOXES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Rigid metallic conduit and fittings (RMC)
- B. Electrical metallic tubing and fittings (EMT)
- C. Flexible metallic conduit and fittings (FMC)
- D. Liquidtight flexible metallic conduit and fittings (LFMC)
- E. Rigid polyvinyl chloride conduit and fittings (PVC)
- F. Wall and ceiling outlet boxes
- G. Electrical connection
- H. Pull and junction boxes

1.2 RELATED WORK

- A. Section 26 05 53 - Electrical Identification: Refer to electrical identification for color and identification labeling requirements.

1.3 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI C80.1 - Rigid Steel Conduit, Zinc-Coated
 - 2. ANSI C80.3 - Electrical Metallic Tubing, Zinc-Coated and Fittings
 - 3. ANSI C80.4 - Fittings for Rigid Metal Conduit and Electrical Metallic Tubing
 - 4. ANSI C80.6 - Intermediate Metal Conduit, Zinc Coated
 - 5. ANSI/NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers and Box Supports
 - 6. ANSI/NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports
- B. Federal Specifications (FS):
 - 1. A-A-50553A - Fittings for Conduit, Metal, Rigid, (Thick-Wall and Thin-Wall (EMT) Type
 - 2. A-A-55810 - Specification for Flexible Metal Conduit
- C. NECA "Standards of Installation"
- D. National Electrical Manufacturers Association (NEMA):
 - 1. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing and Cable
 - 2. RN 1 - Polyvinyl chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit, Rigid Aluminum Conduit, and Intermediate Metal Conduit
 - 3. TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit
 - 4. TC 9 - Fittings for PVC Plastic Utilities Duct for Underground Installation

SECTION 26 05 33 CONDUIT AND BOXES

- E. NFPA 70 - National Electrical Code (NEC)
- F. Underwriters Laboratories (UL): Applicable Listings
 - 1. UL 1 - Flexible Metal Conduit
 - 2. UL 6 - Rigid Metal Conduit
 - 3. UL 360 - Liquid Tight Flexible Steel Conduit
 - 4. UL514-B - Conduit Tubing and Cable Fittings
 - 5. UL651-A - Type EB and a PVC Conduit and HDPE Conduit
 - 6. UL651-B - Continuous Length HDPE Conduit
 - 7. UL746A - Standard for Polymeric Materials - Short Term Property Evaluations
 - 8. UL797 - Electrical Metal Tubing
 - 9. UL1242 - Intermediate Metal Conduit
- G. Definitions:
 - 1. Fittings: Conduit connection or coupling.
 - 2. Body: Enlarged fittings with opening allowing access to the conductors for pulling purposes only.
 - 3. Mechanical Spaces: Enclosed areas, usually kept separated from the general public, where the primary use is to house service equipment and to route services. These spaces generally have exposed structures, bare concrete and non-architecturally emphasized finishes.
 - 4. Finished Spaces: Enclosed areas where the primary use is to house personnel and the general public. These spaces generally have architecturally emphasized finishes, ceilings and/or floors.
 - 5. Concealed: Not visible by the general public. Often indicates a location either above the ceiling, in the walls, in or beneath the floor slab, in column coverings, or in the ceiling construction.
 - 6. Above Grade: Not directly in contact with the earth. For example, an interior wall located at an elevation below the finished grade shall be considered above grade but a wall retaining earth shall be considered below grade.
 - 7. Slab: Horizontal pour of concrete used for a floor or sub-floor.

PART 2 - PRODUCTS

2.1 RIGID METALLIC CONDUIT (RMC) AND FITTINGS

- A. Manufacturers:
 - 1. Atkore Allied Tube & Conduit
 - 2. NUCOR/NUCOR
 - 3. Electroline
 - 4. Western Tube
 - 5. Wheatland Tube Co
 - 6. or approved equal.
- B. Manufacturers of RMC Conduit Fittings:
 - 1. ABB/Thomas & Betts
 - 2. Eaton/Crouse-Hinds
 - 3. Electroline
 - 4. Emerson Appleton & OZ Gedney
 - 5. Hubbell Raco and Killark
 - 6. NSI Bridgeport
 - 7. Orbit Industries

SECTION 26 05 33
CONDUIT AND BOXES

8. Wesco Regal
 9. or approved equal.
- C. Minimum Size Galvanized Steel: 3/4 inch, unless otherwise noted.
- D. Fittings and Conduit Bodies:
1. End Bell Fittings: Malleable iron, hot dip galvanized, threaded flare type with provisions for mounting to form.
 2. Expansion Joints: Malleable iron and hot dip galvanized providing a minimum of 4 inches of movement. Fitting shall be watertight with an insulating bushing and a bonding jumper.
 3. Expansion Joint for Concrete Encased Conduit: Neoprene sleeve with bronze end coupling, stainless steel bands and tinned copper braid bonding jumper. Fittings shall be watertight and concrete-tight.
 4. Conduit End Bushings: Malleable iron type with molded-on high impact phenolic thermosetting insulation. Where required elsewhere in the contract documents, bushing shall be complete with ground conductor saddle and clamp. High impact phenolic threaded type bushings are not acceptable.
 5. All other fittings and conduit bodies shall be of malleable iron construction and hot dip galvanized.
- E. PVC Externally Coated Conduit: Compliant with UL 6, ANSI C80.1 and NEMA RN 1; rigid galvanized steel conduit with external 40 mil PVC coating and internal 2 mil urethane coating surface. All fittings and conduit bodies shall be complete with coating. The PVC coated system shall include necessary PVC coated fittings, boxes and covers to form a complete encapsulated system.
1. Acceptable Manufacturers:
- a. Atkore Calbond Calpipe
 - b. Robroy Perma-cote and Plati-Bond
 - c. ABB Ocal
 - d. or approved equal.

2.2 ELECTRICAL METALLIC TUBING (EMT) AND FITTINGS

- A. Minimum Size Electrical Metallic Tubing: 3/4 inch, unless otherwise noted.
- B. Manufacturers of EMT Conduit:
1. Allied Tube & Conduit
 2. Calbond Calpipe
 3. NUCORNUCOR
 4. Electroline
 5. Western Tube
 6. Wheatland Tube Co
 7. or approved equal.
- C. Fittings and Conduit Bodies:
1. 2" Diameter or Smaller: Compression or steel set screw type of steel designed for their specific application.
 2. 1/2" and 3/4" Conduit: Push-on connectors and couplers with locking ring and washer of zinc plated steel, listed for use in dry locations.
 3. Larger than 2": Compression or steel set screw type of steel designed for their specific application.

SECTION 26 05 33
CONDUIT AND BOXES

4. Manufacturers of EMT Conduit Fittings:

- a. ABB/Thomas & Betts
- b. Eaton/Crouse-Hinds
- c. Electroline
- d. Emerson Appleton & OZ Gedney
- e. Hubbell Raco and Killark
- f. NSI Bridgeport
- g. Orbit Industries
- h. Wesco Regal
- i. or approved equal.

2.3 FLEXIBLE METALLIC CONDUIT (FMC) AND FITTINGS

- A. Minimum Size Galvanized Steel: 3/4 inch, unless otherwise noted. Lighting branch circuit wiring to an individual luminaire may be a manufactured, UL listed 3/8" flexible metal conduit and fittings with #14 AWG THHN conductors and an insulated ground wire. Maximum length of 3/8" FMC shall be six (6) feet.
- B. Manufacturers:
1. ABB/Thomas & Betts
 2. Anamet Electrical
 3. Atkore American Flex AFC and Flexicon
 4. Electri-Flex Co
 5. Electroline
 6. Southwire Alflex
 7. or approved equal.
- C. Construction: Flexible steel, approved for conduit ground, zinc coated, threadless type formed from a continuous length of spirally wound, interlocked zinc coated strip steel. Provide a separate equipment grounding conductor when used for equipment where flexibility is required.
- D. Fittings and Conduit Bodies:
1. Threadless hinged clamp type, galvanized zinc coated cadmium plated malleable cast iron or screw-in type, die-cast zinc.
 2. Fittings and conduit bodies shall include plastic or cast metal inserts supplied by the manufacturer to protect conductors from sharp edges.
 3. Manufacturers:
 - a. ABB/Thomas & Betts
 - b. Eaton/Crouse-Hinds
 - c. Electroline
 - d. Emerson Appleton & OZ Gedney
 - e. Hubbell Raco and Killark
 - f. NSI Bridgeport
 - g. Orbit Industries
 - h. Wesco Regal
 - i. or approved equal.

2.4 LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT (LFMC) AND FITTINGS

- A. Manufacturers:
1. ABB/Thomas & Betts
 2. Anamet Electrical

SECTION 26 05 33 CONDUIT AND BOXES

3. Atkore American Flex AFC and Flexicon
 4. Electri-Flex Co
 5. Electroline
 6. Southwire Alflex
 7. or approved equal.
- B. Construction: Flexible steel, approved for conduit ground, zinc coated, threadless type formed from a continuous length of spirally wound, interlocked zinc coated strip steel and an extruded PVC cover.
- C. Fittings and Conduit Bodies:
1. Watertight, compression type, galvanized zinc coated cadmium plated malleable cast iron, UL listed.
 2. Fittings and conduit bodies shall include plastic or cast metal inserts supplied by the manufacturer to protect conductors from sharp edges.
 3. Manufacturers:
 - a. ABB/Thomas & Betts
 - b. Eaton/Crouse-Hinds
 - c. Electroline
 - d. Emerson Appleton & OZ Gedney
 - e. Hubbell Raco and Killark
 - f. NSI Bridgeport
 - g. Orbit Industries
 - h. Wesco Regal
 - i. or approved equal.

2.5 RIGID NON-METALLIC CONDUIT (PVC) AND FITTINGS

- A. Minimum Size Rigid Smooth-Wall Nonmetallic Conduit: 3/4 inch, unless otherwise noted.
- B. Acceptable Manufacturers:
1. ABB/Carlton
 2. Chevron Phillips Chemical Company
 3. Cantex, J.M. Mfg.
 4. Atkore Heritage Plastics
 5. or approved equal.
- C. Construction: Schedule 40 and Schedule 80 rigid polyvinyl chloride (PVC), UL labeled for 90°C.
- D. Fittings and Conduit Bodies: NEMA TC 3; sleeve type suitable for and manufactured especially for use with the conduit by the conduit manufacturer.
- E. Plastic cement for joining conduit and fittings shall be provided as recommended by the manufacturer.

ASTM Test	Description	Values HDPE
D-1505	Density g/CM 3	less than 0.941
D-1238	Melt Index, g/10 min Condition E	greater than 0.55 grams/10 min.
D-638	Tensile Strength at yield (psi)	3000 min.
D-1693	Environmental Stress Crack Resistance Condition B, F 20	96 hrs.
D-790	Flexural Modulus, MPa (psi)	less than 80,000
D-746	Brittleness Temperature	-75°C Max

SECTION 26 05 33
CONDUIT AND BOXES

2.6 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1; galvanized steel, 16 gauge (approximately 0.0625 inches), with 1/2-inch male fixture studs where required.
- B. Nonmetallic Outlet Boxes: ANSI/NEMA OS 2.
- C. Cast Boxes: NEMA FB1, Type FD, Aluminum, cast fer alloy, or stainless steel deep type, gasketed cover, threaded hubs.
- D. Outlet boxes for luminaires to be not less than 1-1/2" deep, deeper if required by the number of wires or construction. The box shall be coordinated with surface luminaires to conceal the box from view or provide a finished trim plate.
- E. Switch outlet boxes for local light control switches, dimmers and occupancy sensors shall be 4 inches square by 2-1/8 inches deep, with raised cover to fit flush with finish wall line. Multiple gang switch outlets shall consist of the required number of gang boxes appropriate to the quantity of switches comprising the gang. Where walls are plastered, provide a plaster raised cover. Where switch outlet boxes occur in exposed concrete block walls, boxes shall be installed in the block cavity with a raised square edge tile cover of sufficient depth to extend out to face of block or masonry boxes.
- F. Wall or column receptacle outlet boxes shall be 4 inches square with raised cover to fit flush with finished wall line. Boxes in concrete block walls shall be installed the same as for switch boxes in block walls.

2.7 ECONN; ELECTRICAL CONNECTION

- A. Electrical connection to equipment and motors, sized per Electrical Code. Coordinate requirements with contractor furnishing equipment or motor. Refer to specifications and general installation notes for terminations to motors.

2.8 JB; PULL AND JUNCTION BOXES

- A. Sheet Metal Boxes: ANSI/NEMA OS 1; galvanized steel.
- B. Sheet metal boxes larger than 12 inches in any dimension that contain terminations or components: Continuous hinged enclosure with 1/4 turn latch and white back panel for mounting terminal blocks and electrical components.
- C. Cast Metal Boxes for Outdoor and Wet Location Installations: NEMA 250; Type 4 and Type 6, flat-flanged, surface-mounted junction box, UL listed as raintight. Galvanized cast iron box and cover with ground flange, neoprene gasket, and stainless steel cover screws.
- D. Cast Metal Boxes for Underground Installations: NEMA 250; Type 4, inside flanged, recessed cover box for flush mounting, UL listed as raintight. Galvanized cast iron box and plain cover with neoprene gasket and stainless steel cover screws.

SECTION 26 05 33
CONDUIT AND BOXES

- E. Flanged type boxes shall be used where installed flush in wall.

Model	Service	Element Material	Temperature Range
S	Standard (Stainless)	EPDM	-40°F to 250°F
T	Fire Seals (1 hour)	Silicone	-67°F to 400°F
FS	Fire Seals (3 hours)	Silicone	-67°F to 400°F
OS	Oil Resistant / Stainless	Nitrile	-40°F to 210°F

PART 3 - EXECUTION

3.1 CONDUIT INSTALLATION SCHEDULE AND SIZING

- A. In the event the location of conduit installation represents conflicting installation requirements as specified in the following schedule, a clarification shall be obtained from the Architect/Engineer. If this Contractor is unable to obtain a clarification as outlined above, concealed rigid galvanized steel conduit installed per these specifications and the Electrical Code shall be required.
- B. Installation Schedule: Refer to drawings.
- C. Size conduit as shown on the drawings and specifications. Where not indicated in the contract documents, conduit size shall be according to the Electrical Code. Conduit and conductor sizing shall be coordinated to limit conductor fill to less than 40%, maintain conductor ampere capacity as required by the Electrical Code (to include enlarged conductors due to temperature and quantity derating values) and to prevent excessive voltage drop and pulling tension due to long conduit/conductor lengths.
- D. Minimum Conduit Size (Unless Noted Otherwise):
1. Above Grade: 3/4 inch. (The use of 1/2 inch would be allowed for installation conduit to individual light switches, individual receptacles and individual fixture whips from junction box.)
 2. Below Grade 5' or less from Building Foundation: 1 inch.
 3. Below Grade More than 5' from Building Foundation: 1 inch.
 4. Controls Conduit: 1/2 inch.
- E. Conduit sizes shall change only at the entrance or exit to a junction box, unless specifically noted on the drawings.

3.2 CONDUIT ARRANGEMENT

- A. In general, conduit shall be installed concealed in walls, in finished spaces and where possible or practical, or as noted otherwise. Conduit shall be installed parallel or perpendicular to walls, ceilings, and exposed structural members. In unfinished spaces, mechanical and utility areas, conduit may run either concealed or exposed as conditions dictate and as practical unless noted otherwise on drawings. Installation shall maintain headroom in exposed vicinities of pedestrian or vehicular traffic.
- B. Exposed conduit on exterior walls or above roof will not be allowed without prior written approval of Architect/Engineer. A drawing of the proposed routing and a photo of the location shall be submitted 14 days prior to start of conduit rough-in. Routing shall be shown on coordination drawings.

SECTION 26 05 33
CONDUIT AND BOXES

- C. Conduit shall not share the same cell as structural reinforcement in masonry walls.
- D. Conduit runs shall be routed as shown on large scale drawings. Conduit routing on drawings scaled 1/4"=1'-0" or less shall be considered diagrammatic, unless noted otherwise. The correct routing, when shown diagrammatically shall be chosen by the Contractor based on information in the contract documents, in accordance with manufacturer's written instructions, applicable codes, the NECA's "Standard of Installation", in accordance with recognized industry standards, and coordinated with other contractors.
- E. Contractor shall adapt Contractor's work to the job conditions and make such changes as required and permitted by the Architect/Engineer, such as moving to clear beams and joists, adjusting at columns, avoiding interference with windows, etc., to permit the proper installation of other mechanical and/or electrical equipment.
- F. Contractor shall cooperate with all contractors on the project. Contractor shall obtain details of other contractor's work to ensure fit and avoid conflict. Any expense due to the failure of This Contractor to do so shall be paid for in full by Contractor. The other trades involved as directed by the Architect/Engineer shall perform the repair of work damaged as a result of neglect or error by This Contractor. The resultant costs shall be borne by This Contractor.

3.3 CONDUIT SUPPORT

- A. Conduit runs installed above a suspended ceiling shall be properly supported. In no case shall conduit rest on the suspended ceiling construction, nor utilize ceiling support system for conduit support.
 - 1. Support wire used to independently support raceway and wiring systems above suspending ceilings shall be supported on both ends, minimum 12 gauge suspended ceiling support wire, and distinguishable from ceiling support systems by color (field paint), tagging, or equivalent means.
- B. Conduit shall not be supported from ductwork, water, sprinkler piping, or other non-structural members, unless approved by the Architect/Engineer. All supports shall be from structural slabs, walls, structural members, and bar joists, and coordinated with all other applicable contractors, unless noted otherwise.
- C. Conduit shall be held in place by the correct size of galvanized one-hole conduit clamps, two-hole conduit straps, patented support devices, clamp back conduit hangers, or by other means if called for on the drawings.
- D. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.
- E. Spring-steel conduit clips specifically designed for supporting single conduits or tubing may be used in lieu of malleable-iron hangers for 1-1/2" and smaller raceways serving lighting and receptacle branch circuits above accessible ceilings and for securing raceways to slotted channel and angle supports.
- F. Group conduits in parallel runs where practical and use conduit racks or trapeze hangers constructed of steel channel, suspended with threaded solid rods or wall mounted from metal channels with conduit straps or clamps. Provide space in each rack or trapeze for 25% additional conduits.
- G. Do not exceed 25 lbs. per hanger and a minimum spacing of 2'-0" on center when attaching to metal roof decking (excludes concrete on metal deck). This 25 lbs. load and 2'-0" spacing include adjacent electrical and mechanical items hanging from deck. If the hanger restrictions cannot be achieved, supplemental framing off steel framing will need to be added.

SECTION 26 05 33 CONDUIT AND BOXES

- H. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.
- I. Supports for metallic conduit shall be no greater than 10 feet. A smaller interval may be used if necessitated by building construction, but in no event shall support spans exceed the Electrical Code requirements. Conduit shall be securely fastened within 3 feet of each outlet box, junction box, device box, cabinet, or fitting.
- J. Supports of flexible conduit shall be within 12 inches of each outlet box, junction box, device box, cabinet, or fitting and at intervals not to exceed 4.5 feet.
- K. Supports for non-metallic conduit shall be at sufficiently close intervals to eliminate any sag in the conduit. The manufacturer's recommendations shall be followed, but in no event shall support spans exceed the Electrical Code requirements.
- L. Where conduit is to be installed in poured concrete floors or walls, provide concrete-tight conduit inserts securely fastened to forms to prevent conduit misplacement.
- M. Finish:
 - 1. Prime coat exposed steel hangers and supports. Hangers and supports in crawl spaces, pipe shafts, and above suspended ceiling spaces are not considered exposed.
 - 2. Trim all ends of exposed field fabricated steel hangers, slotted channel and threaded rod to within 1" of support or fastener to eliminate potential injury to personnel unless shown otherwise on the drawings. Smooth ends and install elastomeric insulation with two coats of latex paint if exposed steel is within 6'-6" of finish floor and presents potential injury to personnel.

3.4 CONDUIT INSTALLATION

- A. Conduit Connections:
 - 1. Shorter than standard conduit lengths shall be cut square using industry standards. The ends of all conduits cut shall be reamed or otherwise finished to remove all rough edges.
 - 2. Metallic conduit connections in slab on grade installation shall be sealed and one coat of rust inhibitor primer applied after the connection is made.
 - 3. Where conduits with tapered threads cannot be coupled with standard couplings, then approved split or Erickson couplings shall be used. Running threads will not be permitted.
 - 4. Install expansion/deflection joints where conduit crosses structure expansion/seismic joints.
- B. Conduit terminations for all low voltage wiring shall have nylon bushings installed on each end of every conduit run.
- C. Conduit Bends:
 - 1. Use a hydraulic one-shot conduit bender or factory elbows for bends in conduit 2" in size or larger. All steel conduit bending shall be done cold; no heating of steel conduit shall be permitted.
 - 2. All bends of rigid polyvinyl chloride conduit (PVC) shall be made with the manufacturer's approved bending equipment. The use of spot heating devices will not be permitted (i.e. blow torches).
 - 3. A run of conduit shall not contain more than the equivalent of four (4) quarter bends (360°), including those bends located immediately at the outlet or body.
 - 4. Rigid polyvinyl chloride conduit (PVC) runs longer than 100 feet or runs which have more than two 90° equivalent bends (regardless of length) shall use rigid metal or RTRC factory elbows for bends.

SECTION 26 05 33 CONDUIT AND BOXES

5. Use conduit bodies to make sharp changes in direction (i.e. around beams).

D. Conduit Placement:

1. Conduit shall be mechanically continuous from source of current to all outlets. Conduit shall be electrically continuous from source of current to all outlets, unless a properly sized grounding conductor is routed within the conduit. All metallic conduits shall be bonded per the Electrical Code.
2. Route exposed conduit and conduit above suspended ceilings (accessible or not) parallel/perpendicular to the building structural lines, and as close to building structure as possible. Wherever possible, route horizontal conduit runs above water and steam piping.
3. Route conduit through roof openings provided for piping and ductwork where possible. If not provided or routing through provided openings is not possible, route through roof jack with pitch pocket. Coordinate roof penetrations with other trades.
4. Conduits, raceway, and boxes shall not be installed in concealed locations in metal deck roofing or less than 1.5" below bottom of roof decking.
5. Avoid moisture traps where possible. Where unavoidable, provide a junction box with drain fitting at conduit low point.
6. All conduits through walls shall be grouted or sealed into openings. Where conduit penetrates firewalls and floors, seal with a UL listed sealant. .
7. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPENINGS REQUIRED IN MASONRY OR EXTERIOR WALLS UNDER THIS DIVISION. A QUALIFIED MASON AT THE EXPENSE OF THIS CONTRACTOR SHALL REPAIR ALL OPENINGS TO MATCH EXISTING CONDITIONS.
8. Seal interior of conduit at exterior entries, air handling units, coolers/freezers, etc., and where the temperature differential can potentially be greater than 20°F, to prevent moisture penetration. Seal shall be placed where conduit enters warm space. Conduit seal fitting shall be a drain/seal, with sealing compound, identified for use with cable and raceway system.
9. Horizontal conduit routing through slabs above grade
 - a. No conduits are allowed to be routed horizontally through slabs above grade.
10. Rigid polyvinyl chloride conduit (PVC) shall be installed when material surface temperatures and ambient temperature are greater than 40°F.
11. Where rigid polyvinyl chloride conduit (PVC) is used below grade, in a slab, below a slab, etc., a transition to rigid galvanized steel conduit shall be installed before conduit exits earth. The conduit shall extend a minimum of 6" into the surface concealing the non-metallic conduit.
12. Contractor shall provide suitable mechanical protection around all conduits stubbed out from floors, walls or ceilings during construction to prevent bending or damaging of stubs due to carelessness with construction equipment.
13. Contractor shall provide a polypropylene pull cord with 2000 lbs. tensile strength in each empty conduit (indoor and outdoor), except in sleeves and nipples.

3.5 CONDUIT TERMINATIONS

- A. Where conduit bonding is indicated or required in the contract documents, the bushings shall be a grounding type sized for the conduit and ground bonding conductor as manufactured by O-Z/Gedney, Appleton, Thomas & Betts, Burndy, Regal, Orbit Industries or approved equal.
- B. Conduits with termination fittings shall be threaded for one (1) lock nut on the outside and one (1) lock nut and bushing on the inside of each box.
- C. Where conduits terminate in boxes with knockouts, they shall be secured to the boxes with lock nuts and provided with approved screw type tinned iron bushings or fittings with plastic inserts.

SECTION 26 05 33 CONDUIT AND BOXES

- D. Where conduits terminate in boxes, fittings, or bodies with threaded openings, they shall be tightly screwed against the shoulder portion of the threaded openings.
- E. Conduit terminations to all motors shall be made with flexible metallic conduit (FMC), unless noted otherwise. Final connections to roof exhaust fans, or other exterior motors and motors in damp or wet locations shall be made with liquidtight flexible metallic conduit (LFMC). Motors in hazardous areas, as defined in the Electrical Code, shall be connected using flexible conduit rated for the environment. Flexible conduit shall not exceed 6' in length. Route equipment ground conductors from circuit ground to motor ground terminal through flexible conduit.
- F. Rigid polyvinyl chloride conduit (PVC) shall be terminated using fittings and bodies produced by the manufacturer of the conduit, unless noted otherwise. Prepare conduit as per manufacturer's recommendations before joining. All joints shall be solvent welded by applying full even coat of plastic cement to the entire areas that will be joined. Turn the conduit at least a quarter to one half turn in the fitting and let the joint cure for 1-hour minimum or as per the manufacturer's recommendations.
- G. All conduit ends shall be sealed with plastic immediately after installation to prevent the entrance of any foreign matter during construction. The seals shall be removed and the conduits blown clear of all foreign matter prior to any wires or pull cords being installed.

3.6 UNDERGROUND CONDUIT INSTALLATION

- A. Conduit Connections:
 - 1. Conduit joints in a multiple conduit run shall be staggered at least one foot apart.
- B. Conduit Bends (Lateral):
 - 1. Conduits shall have long sweep radius elbows instead of standard elbows wherever special bends are indicated and noted on the drawings, or as required by the manufacturer of the equipment or system being served.
- C. Conduit Elbows (vertical):
 - 1. Minimum metal or RTRC elbow radiuses shall be 30 inches for primary conduits (greater than 600V) and 18 inches for secondary conduits (less than 600V). Increase radius, as required, based on pulling tension calculation requirements.
- D. Expansion Fittings at Finished Grade: Provide underground raceways with an expansion fitting after emerging from finished grade and exterior equipment pads. Field locate the expansion fitting above and within 24 inches of finished grade. Raceways extending less than 12 inches above finished grade, transitioning to LFMC within 12 inches of finished grade, and interior concrete building slabs do not require an expansion fitting unless required by code.
- E. Conduit Placement:
 - 1. Conduit runs shall be pitched a minimum of 4" per 100 feet to drain toward the terminations. Duct runs shall be installed deeper than the minimum wherever required to avoid any conflicts with existing or new piping, tunnels, etc.
 - 2. For parallel runs, use suitable separators and chairs installed not greater than 4' on centers. Band conduit together with suitable banding devices. Securely anchor conduit to prevent movement during concrete placement or backfilling.
 - 3. Where concrete is required, the materials for concreting shall be thoroughly mixed to a minimum $f'c = 2500$ and immediately placed in the trench around the conduits. No concrete that has been allowed to partially set shall be used.

SECTION 26 05 33 CONDUIT AND BOXES

4. Before the Contractor pulls any cables into the conduit, Contractor shall have a mandrel 1/4" smaller than the conduit inside diameter pulled through each conduit and if any concrete or obstructions are found, the Contractor shall remove them and clear the conduit. Spare conduit shall also be cleared of all obstructions.
5. Conduit terminations in manholes, masonry pull boxes, or masonry walls shall be with malleable iron end bell fittings.
6. All spare conduits not terminated in a covered enclosure shall have its terminations plugged as described above.
7. Ductbanks and conduit shall be installed a minimum of 24" below finished grade, unless otherwise noted on the drawings or elsewhere in these specifications.
8. All non-metallic conduit installed underground outside of a slab shall be rigid.

F. Raceway Seal (Exterior to Raceway):

1. All power, telecommunication, electrical conduits and innerducts shall be sealed between the raceway and the building foundation. The raceway penetration shall be sealed liquid-tight, water-tight, non-corrosive.
2. Below Grade Installation Options:
 - a. Cast-in-place concrete installation.
 - b. Hydraulic cement, hydraulic grout, hydraulic epoxy.
 - c. Foundation - Underground Sleeves and Seals; refer to Part 2-Products for product information.
3. Above Grade Installation Options:
 - a. Masonry grout for masonry applications.
 - b. Caulk Sealant, interior/exterior rated, color per architect. Refer to architectural specifications for additional requirements.

G. Raceway Seal (Interior to Raceway, with Cables or Empty):

1. All power, telecommunication, electrical conduits and innerducts, including those with cables, shall be sealed at the building and vault entry. The seal shall prevent the entry of liquids or gases. Seal must be compatible with conductors and raceway system. Spare or unused raceways shall also be sealed.
2. Installation Schedule, nominal size:
 - a. 2" or less: Duct Seal Bushing or Duct Sealant
 - b. 2-1/2" through 4": Duct Seal Bushing
 - c. 5" and 6": Wall Sleeve Duct Seal System

3.7 BOX INSTALLATION SCHEDULE

A. Galvanized steel boxes may be used in:

1. Concealed interior locations above ceilings and in hollow studded partitions.
2. Exposed interior locations in mechanical rooms and in rooms without ceilings; higher than 8' above the highest platform level.
3. Direct contact with concrete except slab on grade.

SECTION 26 05 33 CONDUIT AND BOXES

B. Cast boxes shall be used in:

1. Exterior locations.
2. Exposed interior locations within 8' of the highest platform level.
3. Direct contact with concrete in slab on grade.
4. Wet locations.

3.8 COORDINATION OF BOX LOCATIONS

- A. Provide electrical boxes as shown on the drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance.
- B. Electrical box locations shown on the Contract Drawings are approximate, unless dimensioned. Verify location of floor boxes and outlets in offices and work areas prior to rough-in.
- C. Locate and install boxes to allow access. Avoid interferences with ductwork, piping, structure, equipment, etc. Recessed luminaires shall not be used as access to outlet, pull, and junction boxes. Where installation is inaccessible, provide access doors. Coordinate locations and sizes of required access doors with the Architect/Engineer and General Contractor.
- D. Locate and install to maintain headroom and to present a neat appearance.
- E. Coordinate locations with Heating Contractor to avoid baseboard radiation cabinets.

3.9 OUTLET BOX INSTALLATION

- A. Do not install boxes back-to-back in walls.
 1. Provide a minimum horizontal separation of 6 inches between boxes installed on opposite sides of non-rated stud walls. When the minimum separation cannot be maintained, install sound insulation pads on all five sides of the back box in accordance with the manufacturer's instructions.
 2. Provide a minimum horizontal separation of 24 inches between boxes installed on opposite sides of fire-rated walls. When the minimum separation cannot be maintained, the box is greater than 16 square inches or the total box area (all trades) per 100 square feet is greater than or equal to 100 square inches, install fire-rated moldable pads to all five sides of the back box to maintain the fire rating of the wall. Install moldable pads in accordance with UL listing for the specific product. Sound insulation pads are not acceptable for use in fire-rated wall applications unless the product carries the necessary fire rating.
- B. Install sound insulation pads on all five sides of the back of all boxes in sound-rated wall assemblies. Sound-rated wall assemblies are defined as partition types carrying a Sound Transmission Class (STC) rating.
- C. The Contractor shall anchor switch and outlet box to wall construction so that it is flush with the finished masonry, paneling, drywall, plaster, etc. The Contractor shall check the boxes as the finish wall surface is being installed to assure that the box is flush. (Provide plaster rings as necessary.)
- D. Mount at heights shown or noted on the drawings or as generally accepted if not specifically noted.
- E. Locate boxes in masonry walls to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat openings for boxes.

SECTION 26 05 33 CONDUIT AND BOXES

- F. Provide knockout closures for unused openings.
- G. Support boxes independently of conduit.
- H. Use multiple-gang boxes where more than one device is mounted together; do not use sectional boxes. Provide barriers to separate wiring of different voltage systems.
- I. Install boxes in walls without damaging wall insulation.
- J. Coordinate mounting heights and locations of outlets mounted above counters, benches, backsplashes, and below baseboard radiation.
- K. Position outlets to locate luminaires as shown on reflected ceiling drawings.
- L. Provide recessed outlet boxes in finished areas; secure boxes to interior wall and partition studs, accurately positioned to allow for surface finish thickness. Use stamped steel stud bridges for flush outlets in hollow stud wall, and adjustable steel channel fasteners for flush ceiling outlet boxes.
- M. Align wall-mounted outlet boxes for switches, thermostats, and similar devices.
- N. Provide cast outlet boxes in exterior locations and wet locations, and where exposed rigid or intermediate conduit is used.

3.10 PULL AND JUNCTION BOX INSTALLATION

- A. Locate pull boxes and junction boxes above accessible ceilings or in unfinished areas.
- B. Support pull and junction boxes independent of conduit.
- C. Do not install boxes back-to-back in walls.
 - 1. Provide a minimum horizontal separation of 6 inches between boxes installed on opposite sides of non-rated stud walls. When the minimum separation cannot be maintained, install sound insulation pads on all five sides of the back box in accordance with the manufacturer's instructions.
 - 2. Provide a minimum horizontal separation of 24 inches between boxes installed on opposite sides of fire-rated walls. When the minimum separation cannot be maintained, the box is greater than 16 square inches or the total box area (all trades) per 100 square feet is greater than or equal to 100 square inches, install fire-rated moldable pads to all five sides of the back box to maintain the fire rating of the wall. Install moldable pads in accordance with UL listing for the specific product. Sound insulation pads are not acceptable for use in fire-rated wall applications unless the product carries the necessary fire rating.
- D. Install sound insulation pads on all five sides of the back of all boxes in sound-rated wall assemblies. Sound-rated wall assemblies are defined as partition types carrying a Sound Transmission Class (STC) rating.

3.11 EXPOSED BOX INSTALLATION

- A. Boxes shall be secured to the building structure with proper size screws, bolts, hanger rods, or structural steel elements.

SECTION 26 05 33
CONDUIT AND BOXES

- B. On brick, block and concrete walls or ceilings, exposed boxes shall be supported with no less than two (2) Ackerman-Johnson, Paine, Phillips, or approved equal screw anchors or expansion shields and round head machine screws. Cast boxes shall not be drilled.
- C. On steel structures, exposed boxes shall be supported to the steel member by drilling and tapping the member and fastening the boxes by means of round head machine screws.
- D. Boxes may be supported on steel members by APPROVED beam clamps if conduit is supported by beam clamps.
- E. Boxes shall be fastened to wood structures by means of a minimum of two (2) wood screws adequately large and long to properly support. (Quantity depends on size of box.)
- F. Wood, plastic, or fiber plugs shall not be used for fastenings.
- G. Explosive devices shall not be used unless specifically allowed.

END OF SECTION 260533

SECTION 26 05 53
ELECTRICAL IDENTIFICATION

SECTION 26 05 53 - ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Adhesive Markings and Field Labels
- B. Nameplates and Signs
- C. Product Colors

1.2 REFERENCES

- A. NFPA 70E - National Electrical Safety Code
- B. NFPA 70 - National Electrical Code (NEC)
- C. ANSI A13.1 - Standard for Pipe Identification
- D. ANSI Z535.4 - Standard for Product Safety Signs and Labels

1.3 QUALITY ASSURANCE

- A. Electrical identification products shall be suitable for the environment installed. Identification labels damaged by the environment due to ultraviolet light fading, damp or wet conditions, physical damage, corrosion, or other conditions shall be replaced with labels suitable for the environment.

PART 2 - PRODUCTS

2.1 ADHESIVE MARKINGS AND FIELD LABELS

- A. Pretensioned Flexible Wraparound Colored Plastic Sleeves for Cable Identification: flexible acrylic bands sized to suit the cable diameter and arranged to stay in place by pre-tensioned gripping action when coiled around the cable.
- B. Wire/Cable Designation Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound, cable/conductor markers with preprinted numbers and letter.
- C. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking nylon cable ties, 0.18-inch minimum width, 50-lb minimum tensile strength, and suitable for a temperature range from -40°F to 185°F (-40°C to 85°C), type 2/2S or type 21/21S based on application. Provide ties in specified colors when used for color coding. Cable ties shall be listed and identified for the application, securement, and support.
- D. Aluminum, Wraparound Marker Bands: 1-inch width, 0.014 (5mm) inch thick aluminum bands with stamped or embossed legend, and fitted with slots or ears for permanently securing around wire or cable jacket or around groups of conductors.
- E. Brass or Aluminum Tags: 2" (50mm) by 2" (50mm) by .05-inch metal tags with stamped legend, punched for fastener.

SECTION 26 05 53
ELECTRICAL IDENTIFICATION

- F. Indoor/Outdoor Number and Letters: Outdoor grade vinyl label with acrylic adhesive designed for permanent application in severe indoor and outdoor environments.
- G. Text Sizes:
 - 1. The following information shall be used for text heights, fonts, and size, unless otherwise noted.
 - a. Font: Normal 721 Swiss Bold
 - b. Adhesive Labels: 3/16 inch minimum text height
 - c. Vinyl / Plastic Laminate Labels: 3/4" inch minimum text height

2.2 NAMEPLATES AND SIGNS

- A. Engraved, Plastic-Laminated Labels, Signs and Instruction Plates: Engraving stock melamine plastic laminate, 1/16-inch minimum thick for signs up to 20 square inches, or 8 inches in length; 1/8 inch thick for larger sizes. Labels shall be punched for mechanical fasteners.
- B. Text Sizes:
 - 1. The following information shall be used for text heights, fonts, and size, unless otherwise noted.
 - a. Text Height: 3/8 inch minimum
- C. Baked-Enamel Signs for interior Use: Preprinted aluminum signs, punched, or drilled for fasteners, with colors, legend, and size required for application. Mounting 1/4" grommets in corners.
- D. Safety Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145.
- E. Fasteners for Plastic-Laminated Signs; Self-tapping stainless steel screws or number 10/32 stainless steel machine screws with nuts and flat and lock washers.

2.3 PRODUCT COLORS

- A. Adhesive Markings and Field Labels:
 - 1. Normal Power and General Labels: Black letters on white face
 - 2. Control Labels: Black letters on white face
 - 3. Fire Alarm: Red letters on white face
- B. Nameplates and Signs:
 - 1. NORMAL POWER: Black letters on white face
 - 2. Control Labels: Black letters on white face
- C. Box Covers:
 - 1. Box covers shall be painted to correspond with system type as follows:
 - a. Normal Power and General: Silver
 - b. Fire Alarm System: Red
 - c. Temperature Controls: Refer to mechanical cover sheet for color

SECTION 26 05 53
ELECTRICAL IDENTIFICATION

- D. Conductor Color Identification: Refer to Part 3 for additional information.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Lettering and Graphics: Coordinate names, abbreviations, colors, and other designations used in electrical identification work with corresponding designations specified or indicated. Install numbers, lettering, and colors as required by code.
- B. Install identification devices in accordance with manufacturer's written instruction and requirements of Electrical Code.
- C. Sequence of Work: Where identification is to be applied to surfaces that require finish, install identification after completion of finish work. All mounting surfaces shall be cleaned and degreased prior to identification installation.
- D. Circuit Identification: Tag or label conductors as follows:
1. Multiple Power or Lighting Circuits in Same Enclosure: Where multiple branch circuits are terminated or spliced in a box or enclosure, label each conductor with source and circuit number.
 2. Multiple Control Wiring and Communication/Signal Circuits in Same Enclosure: For control and communications/signal wiring, use wire/cable marking tape at terminations in wiring boxes, troughs, and control cabinets. Use consistent letter/number conductor designations throughout on wire/cable marking tape.
 3. Match identification markings with designations used in panelboards shop drawings, Contract Documents, and similar previously established identification schemes for the facility's electrical installations.
- E. Apply circuit/control/item designation labels of engraved plastic laminate for pushbuttons, pilot lights, alarm/signal components, and similar items, except where labeling is specified elsewhere.
- F. Install labels parallel to equipment lines at locations as required and at locations for best convenience of viewing without interference with operation and maintenance of equipment.
- G. Underground Electrical Lines: For exterior underground power, control, signal, and communication lines, install continuous underground plastic line marker located directly above line at 6 (150mm) to 8 (205mm) inches below grade. A single plastic line marker is permitted when the width of the common trench does not exceed 16 inches; provide a second plastic line marker to mark each edge of the trench when 16 inches of width is exceeded. Install line marker for underground wiring, both direct-buried cables and cables in raceway.

3.2 LIGHTING CONTROL AND RECEPTACLE COVER PLATES

- A. Product:
1. Adhesive labels and field markings
- B. Identification material to be a clear, 3/8-inch Kroy tape or Brother self-laminating vinyl label with black letters. Embossed Dymo-Tape labels are not acceptable. Permanently affix identification label to cover plates, centered above the receptacle openings.

SECTION 26 05 53
ELECTRICAL IDENTIFICATION

- C. Provide identification on all switch and receptacle cover plates. Identification shall indicate source and circuit number serving the device (e.g. "C1A #24"). Identification for switch cover plates shall be installed on the inside cover.

3.3 BOX LABELING

- A. Products:
 - 1. Adhesive labels and field markings
- B. Identify Junction, Pull and Connection Boxes: Labeling shall be 3/8-inch Kroy tape OR Brother self-laminating vinyl label, letters/numbers. In rooms that are painted out, provide labeling on inside of cover.
- C. All junction, pull, and connection boxes shall be identified as follows:
 - 1. For power and lighting circuits, indicate system voltage and identity of contained circuits ("120V, 1LA1-3,5,7").
 - 2. For other wiring, indicate system type and description of wiring ("FIRE ALARM NAC #1").

3.4 CONDUCTOR COLOR CODING

- A. Products:
 - 1. All wire and cables shall be color coded by the manufacturer.
- B. Color coding shall be applied at all panels, switches, junction boxes, pull boxes, vaults, manholes etc., where the wires and cables are visible and terminations are made. The same color coding shall be used throughout the entire electrical system, therefore maintaining proper phasing throughout the entire project.
- C. Where more than one nominal voltage system exists in a building or facility, each ungrounded conductor of a multi-wire branch circuit, where accessible, shall be identified by phase and system.
- D. Conductors shall be color coded as follows:
 - 1. 208Y/120 Volt, 4-Wire:
 - a. A-Phase - Black
 - b. B-Phase - Red
 - c. C-Phase - Blue
 - d. Neutral - White
 - e. Ground Bond - Green
 - 2. Grounding Conductors:
 - a. Equipment grounding conductors, main/system/supply-side bonding jumpers: Green.
 - 3. Cabling for Remote Control, Signal, and Power Limited Circuits:
 - a. Fire Alarm: Refer to Fire Alarm and Automatic Detection Section 28 31 00 for cable color requirements.
 - b. Low Voltage Switching: Per manufacturer recommendations and code requirements.

SECTION 26 05 53
ELECTRICAL IDENTIFICATION

- c. Building Automation Systems and Control: Refer to the Temperature Control Contactor notes located on the mechanical cover sheet.

3.5 EQUIPMENT CONNECTION IDENTIFICATION

A. Products:

- 1. Nameplates and signs

- B. Provide identification for hard wired electrical connections to equipment such as disconnects switches, starters, etc. Plug and cord type connections do not require this specific label.

- C. Identification shall be provided for all connections to equipment furnished by this Contractor, other contractors, or the Owner. The following list of equipment is specifically being listed to receive an equipment connection label; this list does not limit the equipment that shall receive a label:

- 1. Mechanical heating, ventilation, and air conditioning equipment; chillers, boilers, pumps, air handling ventilation units, condensing units, unit heaters, and similar equipment
- 2. Plumbing equipment

D. Labeling shall include:

- 1. Equipment type and contract documents designation of equipment being served
- 2. Location of equipment being served if it is not located within sight.
- 3. Voltage and rating of the equipment.
- 4. Panel and circuit numbers(s) serving the equipment
- 5. Sample Label:

UNIT HEATER UH-1 ("LOCATED IN STORAGE ROOM 200")
480V: 3-PHASE
FED FROM "1HA1-1"

END OF SECTION 260553

SECTION 26 09 33
LIGHTING CONTROL SYSTEMS

SECTION 26 09 33 - LIGHTING CONTROL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Lighting Control Overview
- B. Electrical Plan Symbols
- C. Device Color and Coverplates
- D. Standalone Line and Low Voltage Lighting Controls
 - 1. Wall switches and wall dimmers
 - 2. Sensors (occupancy, vacancy, daylighting, photocell, auxiliary power packs, etc.)

1.2 RELATED SECTIONS

- A. The lighting system design includes a combination of luminaire sources, lighting control components, programming sequences, and supplementary components for building and energy code compliance. The design uses performance-based specifications for portions of the lighting system to account for the limitation of directly comparable product solutions available by competitive manufacturers. The Contractor shall reference related specification sections, plans, schedules, and details prior to submitting pricing, submittals, and installation. The Contractor shall coordinate system component compatibility among various manufacturers and suppliers for a turnkey lighting system. Referenced sections include, but are not limited to, the following:
 - 1. Specification Section 26 51 19 LED Lighting
 - 2. Electrical Drawings: Electrical Coversheet, plans, luminaire schedules, lighting control sequence of operations, diagrams, and details.

1.3 RELATED WORK

- A. Section 01 91 00 - Commissioning
- B. Section 23 09 23 - Direct Digital Control System for HVAC Interface of Lighting Controls with HVAC Controls

1.4 QUALITY ASSURANCE

- A. Manufacturers shall be regularly engaged in the manufacture of lighting control equipment and ancillary equipment, of types and capacities required, whose products have been in satisfactory use in similar service for not less than five (5) years.
- B. All components and assemblies are to be factory pre-tested prior to delivery and installation.

1.5 REFERENCES

- A. FCC Rules and Regulations, Part 15, Subpart J - Radio Frequency Interference
- B. FS W S 896 Switch, Toggle
- C. NEMA WD 1 - General Color Requirements for Wiring Devices

SECTION 26 09 33
LIGHTING CONTROL SYSTEMS

- D. NEMA WD 7 - Occupancy Motion Sensors
- E. NFPA 70 - National Electrical Code (NEC)
- F. UL Standard 916 Energy Management Equipment
- G. UL 924 - Emergency Lighting and Power Equipment
- H. UL 20 - Standards for General-Use Snap Switches
- I. UL 98 - Enclosed and Dead-Front Switches
- J. UL 1472 - Solid-State Dimming Controls

1.6 SUBMITTALS

- A. Submit product data under provisions of Section 26 05 00.
- B. Submit a comprehensive package including devices, hardware, software, product specification, finishes, dimensions, installation instructions, component replacement instructions, warranty, system software requirements.
- C. Provide floor plan showing location, orientation, and coverage area of each control device, sensor, and controller/interface. For areas requiring multiple sensor devices for appropriate coverage, submit specific manufacturer-approved sensor layout as an overlay directly on the project drawings, either in print or approved electronic form. Sensor coverage patterns shall have a 20% overlap.
- D. Submit a list of devices and equipment that will be installed for each sequence of operation.
- E. Submit project specific control wiring diagrams showing all equipment, line voltage, and control wiring requirements for all components including, but not limited to, dimmers, relays, low voltage switches, occupancy sensors, control stations, and communication interfaces and programming instructions for each sequence of operation. Include network cable specification and end-of-line termination details, if required.
- F. Programming Sequences: Provide a copy of the initial lighting control programming sequences in narrative and manufacturer/vendor format.
- G. Lighting Control Stations: The manufacturer/vendor shall provide control station shop drawings showing arrangement of controls, dimensioned elevations, wiring diagram, and recommended backboxes. Label each applicable submittal with the applicable Sequence Of Operation SOO description. Submit data sheets on the switches, dimmers, sensors, buttons, etc. contained in the control station.
- H. Coordinate integration with mechanical and/or other trades.

1.7 EXTRA STOCK

- A. Provide extra stock under provisions of Section 26 05 00.
- B. Sensors, Controls, Power Supplies, and Relays: Five (5) percent of quantity installed. Minimum of two (2) of each configuration and type.

SECTION 26 09 33
LIGHTING CONTROL SYSTEMS

1.8 PROJECT RECORD DOCUMENTS

- A. Submit project record documents under provisions of Section 26 05 00.
- B. Accurately record location of all controls and devices. Include description of switching sequences and circuiting arrangements.

1.9 OPERATION AND MAINTENANCE DATA

- A. Submit emergency, operation, and maintenance data under provisions of Section 26 05 00. Data shall also include the following:
 - 1. Schedule for routine maintenance, inspection, and calibration of all lighting control devices and system components. Recommended schedule for inspection and recalibration of sensors.
 - 2. Complete narrative describing intended operation and sequence for each control scenario and system component, updated to reflect all changes resulting from commissioning of systems. Narrative shall indicate recommended settings for devices where applicable.
 - 3. Replacement part numbers for all system components.
- B. Identify installed location and labeling for each luminaire controlled by automated lighting controls.

1.10 SYSTEM DESCRIPTION

- A. Performance Statement: The specification section and lighting design documents describe the minimum material quality, required features, and operational performance requirements of the lighting control system. The documents do not convey every component, relay, wire, and equipment connection required. The Contractor and lighting control manufacturer/vendor are solely responsible for determining all system components, wiring, and programming required for a complete and operational system based on the performance based requirements of the documents.
- B. Lighting Sequence Of Operation (SOO): The Sequence Of Operation (SOO) describes the required lighting control operation and performance in each space. The Sequence Of Operation descriptions are included on the drawings.
- C. Drawings: The drawings include the Sequence Of Operation (SOO), luminaire schedule, location of control devices, sensors, and identification of control zones, and branch power circuiting. Control wiring and manufacturer/vendor specific components are NOT shown, but shall be submitted with the shop drawing submittals.

1.11 COMMISSIONING

- A. The Contractor shall provide all services necessary for compliance with the IECC Section C408 Commissioning. The commissioning shall include, but not be limited to, a commissioning plan, preliminary commissioning report, construction documents, manuals, final commissioning report, and lighting system functional testing.
- B. This project will have selected building systems commissioned. The Contractor is responsible to execute commissioning. The commissioning process, equipment, and systems to be commissioned are defined in Division 1.
- C. The Contractor shall notify the Architect/Engineer and Owner's Representative ten (10) working days prior to scheduled commissioning date.

SECTION 26 09 33
LIGHTING CONTROL SYSTEMS

- D. The commissioning process requires meeting attendance. Refer to Division 1 for meeting requirements.
- E. The system shall be functionally tested by a factory-authorized engineer and comply with the Sequence of Operation prior to system commissioning. All loads shall be tested live for continuity and freedom from defects, and all control wiring shall be tested for continuity and connections prior to energizing the system.

1.12 WARRANTY

- A. Manufacturer shall warrant products under normal use and service to be free from defects in materials and workmanship for a period of two (2) years from date of commissioning.
- B. Occupancy, vacancy, daylight sensors and controls shall have a five (5) year warranty from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LIGHTING CONTROL OVERVIEW

- A. Lighting Control System: As defined in the System Description, the design documents describe the operational performance requirements of the lighting control system. The Lighting Control System has been categorized into the following groups. Refer to the Electrical Symbol Key, this specification section, and the drawings to determine the appropriate lighting control category when more than one is applicable to the project:
 - 1. Standalone Lighting Control Devices: Independent (standalone) devices traditionally operating at line or low voltage, field configurable with other standalone devices to provide an overall lighting control system.
- B. All system components and materials of similar function (e.g., switches, dimmers, sensors, contactors, relays, etc.) shall be of the same manufacturer, unless specifically stated otherwise on drawings or elsewhere in the specifications. Lighting control switches, systems, and components shall be listed.
- C. The functions described in the lighting sequence of operation shall dictate the actual lighting control device required to accomplish the functions described for the space, unless otherwise noted.

2.2 ELECTRICAL PLAN SYMBOLS

- A. Refer to Electrical Coversheet for Electrical Symbols list and device specification tag.
 - 1. Standalone Lighting Control Devices: Control station commonly defined by an alpha character with subscripts.
 - a. Example symbol "S", tagged "SW-1P", description "switch- single pole switch".
 - b. Example Control Designation: a, b, c (when required to clarify design intent).

SECTION 26 09 33
LIGHTING CONTROL SYSTEMS

2. Sensors, Relays, Accessories: Common plan symbols are used for occupancy, vacancy, and daylighting sensors. The control designations (a, b, c or z1, z2, z3) and identification of a standalone or #B type control station in the space defines the basis-of-design intent category of the lighting control sensors and accessories.
 - a. Example, a standalone occupancy sensor SW-OC-## device is the basis of design when shown in the same room as a standalone S (SW-1P) single pole light switch with or without a, b, c control designations.

2.3 DEVICE COLOR AND COVERPLATES

- A. All switches and lighting controls shall be complete with coverplates that match material and color of the wiring device coverplates in the space. When the coverplate is proprietary to the device/manufacturer and do not match the wiring device coverplates, the architect shall select the coverplate color and materials from the standard coverplate options.
- B. Where several devices are ganged together, the coverplate shall be of the ganged style for the number of devices used.
- C. Install nameplate identification as indicated in Section 26 05 53.
- D. Plate-securing screws shall be metal with head color matching the wall plate finish.

2.4 STANDALONE LINE AND LOW VOLTAGE LIGHTING CONTROLS

- A. Overview:
 1. Wall Switches and Wall Dimmers:
 - a. UL listed with integral air-gap switch for on/off control, integral EMI/RFI suppression, non-viewable heat sink, dimmer to match device color.
 - b. Dimmer compatibility and wiring with the load being controlled shall be verified by Contractor prior to purchase and installation.
- B. **SW-3W**; Three-way Switch:
 1. Single throw, 120/277 volt, 20 amp. Toggle handle, side and back wired.
 2. Manufacturers:
 - a. Hubbell 1223
 - b. Leviton 1223-2
 - c. Pass & Seymour PS20AC3
 - d. Cooper AH1223
- C. **SW-O2**; Dual Technology Occupancy Sensor with Dual Button Wall Switch (Standalone):
 1. Multi-relay wall switch with manual on/auto/off for two separate loads. 120/277 VAC load relay rating of 0-800 W for ballast, LED or tungsten. 5-, 15-, 20-minute adjustable OFF delay. Dual technology ultrasonic/acoustic and PIR coverage of minor motion in 12' x 15' pattern and occupancy detection in area based on half-step walking motion. Sensitivity adjustments separate for each sensing technology.
 2. Manufacturers:
 - a. Watt Stopper DW-200 Series
 - b. Hubbell LHMTD
 - c. Leviton OSSMD Series

SECTION 26 09 33
LIGHTING CONTROL SYSTEMS

d. Sensor Switch WSX-PDT 2P Series

D. **SW-OC-# and SW-VC-#**; Occupancy / Vacancy Sensors (Standalone):

1. Combination Devices: Subscripts identify combination type devices when applicable. The contractor shall provide the combination device or provide multiple device(s) to meet the functionality when the manufacturer does not offer the required functionality with a single device. Manufacturer verified layouts shall include a 20% overlap of coverage patterns.
2. Subscripts: Subscripts are used to define the device type.
 - a. Blank (or D) = Dual Technology
 - b. U = Ultrasonic 360 degree coverage
3. General Description: Wall- or ceiling-mounting, solid-state units with a separate power supply/relay unit.
 - a. Operation - Occupancy: Occupancy sensors turn lights 'on' when covered area is occupied and turn lights 'off' with a time delay when unoccupied, unless otherwise indicated.
 - b. Time Delay 'Off': Field adjustable with a minimum range of 1-20 minutes.
 - c. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor shall be powered from the relay unit.
 - d. Relay Unit: Dry contacts rated for 20 A ballast load at 120 and 277 VAC, for 13-amp tungsten at 120 VAC, and for 1 hp at 120 VAC. Power supply to sensor shall be 24 V dc, 150-mA, Class 2 power source as defined by Electrical Code.
 - e. Mounting:
 - 1) Sensor: Suitable for mounting in any position on a standard outlet box.
 - 2) Relay: Externally mounted through a 1/2-inch knockout in a standard electrical enclosure. Mount relay above accessible ceiling near entry door to room or area.
 - 3) Time Delay and Sensitivity Adjustments: Recessed and concealed.
4. Indicator: LED to show when motion is being detected during testing and normal operation of the sensor.
5. Bypass Switch: Override the on function in case of sensor failure.
6. Power Supply and Child Packs: Provide as required for sensor quantity and switching scheme. Mount to standard 1/2" knockout on electrical box above accessible ceiling near entry door to room or area. Sensor power shall be from emergency circuit if emergency lighting is in the area.
7. Detection Coverage (Room): Detect occupancy anywhere in an area based on hand motion.

Lighting Load	Load A	Load B
Step 1:	On	Off
Step 2:	Off	On
Step 3:	On	On
Step 4:	Off	Off

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work.

SECTION 26 09 33
LIGHTING CONTROL SYSTEMS

- B. Verify field dimensions and coordinate physical size of all equipment with the architectural requirements of the spaces into which they are to be installed. Allow space for adequate ventilation and circulation of air.
- C. Verify that required utilities are available, in proper location, and ready for use.
- D. Beginning of installation means installer accepts existing conditions.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved shop drawings.
- B. All wiring shall be installed in conduit. Class II low voltage control wiring may be open wiring and shall maintain 6 inch spacing from electronic ballast and other RFI/EMI sources.
- C. Low Voltage Cabling (less than 100 volts): Low voltage lighting control cabling shall be plenum listed. Low voltage cables in non-accessible areas shall be installed in conduit. Low voltage lighting control cable may be installed without conduit in accessible areas using the following types of cable supports. Cable support types/systems shall comply with the warranty requirements of the low voltage cable manufacturer.
 - 1. J-hooks; batwing type.
 - 2. Bridle rings with saddle supports.
 - 3. Low voltage cable batwings supported by independent luminaire support systems (luminaire support cabling); use of batwings on ceiling support systems not allowed.
 - 4. Listed cable ties. Low voltage cabling secured to exterior of luminaire power raceway.
- D. All branch load circuits shall be live tested before connecting the loads to the lighting control panel.
- E. Lighting Control Station Wiring: Provide the grounded (neutral) conductor portion of the branch circuit with the line voltage phase conductors at each lighting control station.
- F. Lighting Control Panel Directories: Provide a typewritten directory for each lighting control panel indicating relay/dimmer and description of load controlled.

3.3 BRANCH CIRCUIT POWER WIRING FOR CONTROLLERS

- 1. Branch circuit power for the following lighting control system components shall be provided from the following branches. Lighting control power shall originate from the same branch circuits serving the controlled luminaires:
 - a. The contractor shall coordinate the branch circuit power source required with the Engineer when required for unique lighting control system devices, components, and accessories.

3.4 LOW VOLTAGE LIGHTING CONTROL CABLING

- A. Control Cable Raceway Routing: All wiring shall be installed in conduit.
- B. Control Cabling Installed with Line Voltage Wiring: When low voltage control cabling is installed with line-voltage wiring, the control wiring shall be, copper conductors, minimum 16 AWG or per manufacturer, with cable insulation equal to the line-voltage rating (voltage, temp rating, etc.) and comply with Specification Section 26 05 13 "Wire and Cable."

SECTION 26 09 33
LIGHTING CONTROL SYSTEMS

- C. Splices and Taps: Tapping or wire trap connectors shall be used to splice all Class 1 and Class 2 control wiring. Twist-on, wire-nut type connectors are not allowed.

3.5 SUPPORT SERVICES

A. System Startup:

- 1. Manufacturer shall provide factory authorized technician to confirm proper installation and operation of all system components.

B. Pre-Program, Testing, Training Coordination:

- 1. The construction documents and sequence of operations define the original design intent of the lighting controls as coordinated between the owner and the design team. The definition of the scope is intended to identify the hardware and programming flexibility required prior to programming, system testing, and owner training.
- 2. The final system programming, control station labels, scene presets, dimmer presets, dimmer range limits, fade times, etc. are subject to on site coordination between the design team, owner, contractor, and manufacturer. Contractor/manufacturer programming of the system prior to an onsite coordination with the owner and design team shall not be considered final programming nor commissioning.
- 3. The contractor and manufacturer shall provide on site representatives to provide final programming including preset, scene, switch labeling, and other programming adjustments based on owner and design team onsite observation and verbally requested adjustments as part of the based bid scope of work.
- 4. The contractor shall document onsite requested changes and update operation and maintenance manuals to match final programming.

C. Testing:

- 1. System shall be completely functional tested by a factory-authorized technician. All loads shall be tested live for continuity and freedom from defects, and all control wiring shall be tested for continuity and connections prior to energizing the system components.
- 2. Programming of initial zones, schedules, lighting levels, control station groups, and sensor settings shall be performed by a factory-authorized technician. Lighting Control Sequence of Operation shall serve as a basis for programming, However, all final decisions regarding groups and schedules shall be at the direction of the Owner. The following procedures shall be performed at a minimum:
 - a. Confirm occupancy sensor placement, sensitivity, and time delay settings to meet specified performance criteria.
 - b. Confirm daylight sensor placement, sensitivity, deadband, and delay settings to meet specified performance criteria.
 - c. Confirm that schedules and time controls are configured to meet specified performance criteria and Owner's operating requirements.
 - d. Confirm control station labeling, presets, switch labels, and scenes.
- 3. Verify occupancy/vacancy and daylight sensor operation is correct after furniture and equipment is installed in each area. Make adjustments to sensor settings and time delays to allow proper operation.
- 4. Verify occupancy/vacancy sensors are located to provide complete coverage for the area served with no nuisance switching.
 - a. Relocate sensors or provide additional sensors as necessary to provide adequate coverage.
 - b. Mask occupancy sensors where necessary to prevent nuisance switching from adjacent areas.

SECTION 26 09 33
LIGHTING CONTROL SYSTEMS

D. Training:

1. Manufacturer shall provide competent factory-authorized technician to train Owner personnel in the operation, maintenance and programming of the lighting control system. Submit training plan with notification seven (7) days prior to proposed training dates.
2. Training duration shall be no less than three (3) days, with one (1) day being scheduled at least two (2) weeks after initial training.

E. Documentation:

1. Manufacturer shall provide system documentation including:
 - a. System one-line showing all panels, number and type of control stations and sensors, communication line, and network or building automation system BAS interface unit.
 - b. Drawings for each panel showing hardware configuration and numbering.
 - c. Panel wiring schedules.
 - d. Typical diagrams for each component.

3.6 SYSTEM COMMISSIONING

- A. Contractors' tests shall be scheduled and documented in accordance with the commissioning requirements. Refer to Section 01 09 00, General Commissioning, for further details.
- B. Mask sensors where necessary to prevent nuisance switching from adjacent areas.
- C. System verification testing is part of the commissioning process. Verification testing shall be performed by the Contractor and witnessed and documented by the Commissioning Agent. Refer to Section 01 09 00, General Commissioning, for system verification tests and commissioning requirements.
- D. Training of the Owner's operation and maintenance personnel is required in cooperation with the Owner's Representative. The instruction shall be scheduled in coordination with the Owner's Representative after submission and approval of formal training plans. Refer to Section 01 09 00, General Commissioning, for Contractor training requirements.

END OF SECTION 260933

SECTION 26 27 26 WIRING DEVICES

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Device plates and box covers
- B. Receptacles (REC-#)

1.2 QUALITY ASSURANCE

- A. Provide similar devices from a single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in the Electrical Code, by a testing agency to Authorities Having Jurisdiction and marked for intended use.
- C. Comply with the Electrical Code.

1.3 REFERENCES

- A. DSCC W-C-896F - General Specification for Electrical Power Connector
- B. FS W-C-596 - Electrical Power Connector, Plug, Receptacle, and Cable Outlet
- C. NEMA WD 1 - General Color Requirements for Wiring Devices
- D. NEMA WD 6 - Wiring Devices - Dimensional Requirements
- E. NFPA 70 - National Electrical Code (NEC)
- F. CEC California Electrical Code
- G. UL 498 - Standard for Attachment Plugs and Receptacles
- H. UL 943 - Standard for Ground Fault Circuit Interrupters

1.4 SUBMITTALS

- A. Submit product data under provisions of Section 26 05 00.
- B. Provide product data showing configurations, finishes, dimensions, and manufacturer's instructions.
- C. Provide a non-returnable sample of each countertop and furniture-mounted receptacle assembly as part of the submittal process.

1.5 COORDINATION

- A. Receptacles for Owner Furnished Equipment: Match plug configurations.
- B. Cord and Plug Sets: Match equipment requirements.

SECTION 26 27 26
WIRING DEVICES

PART 2 - PRODUCTS

2.1 DEVICE COLOR

- A. All switch, receptacle, and outlet colors shall be ivory, unless indicated otherwise.

2.2 COVERPLATES

- A. All switches, receptacles, and outlets shall be complete with the following:
1. Unbreakable thermoplastic/thermoset plastic and match device color coverplates in finished spaces where walls are finished.
 2. #302 stainless steel coverplates in unfinished spaces for flush boxes.
 3. Galvanized steel coverplates in unfinished spaces for surface mounted boxes.
- B. Where several devices are ganged together, the coverplate shall be of the ganged style for the number of devices used.
- C. Install nameplate identification as indicated in Section 26 05 53.
- D. Plate securing screws shall be metal with head color matching the wall plate finish.

2.3 RECEPTACLES

- A. Refer to Electrical Symbols List for device type.
- B. REC-DUP-GFI: NEMA 5-20R Ground Fault Duplex Receptacle:
1. Standard Grade: 125-volt, 20 amp, 3-wire grounding type with test and reset buttons in impact resistant thermoplastic face, listed.
 - a. Device shall perform self-test of GFCI circuitry in accordance with UL 943.
 - b. Manufacturers:
 - 1) Hubbell GF20L
 - 2) Leviton GFNT2
 - 3) Pass & Seymour 2097
 - 4) Cooper SGF20
- C. REC-DUP-WP: NEMA 5-20R Weatherproof Ground Fault Duplex Receptacle:
1. 125-volt, 20 amp, 3-wire grounding type with test and reset buttons in impact resistant thermoplastic face, weather resistant WR listed. Provide extra-duty NEMA 3R rated while-in-use clear outlet box hood.
 2. Device shall perform self-test of GFCI circuitry in accordance with UL 943.
 - a. Manufacturers:
 - 1) Hubbell:
 - a) GFTWRST20 with clear housing RW57300
 - 2) Leviton GFWT2 with clear housing 5977-CL
 - 3) Pass & Seymour 2097TRWR with clear housing WIUC10-C
 - 4) Cooper WRS GF20 with clear housing WIU-1

SECTION 26 27 26
WIRING DEVICES

- D. Back wired devices shall be complete with eight holes that are screw activated with metal clamps for connection to #12 or #10 copper conductors.
- E. Side wired devices shall have four binding screws that are undercut for positive wire retention.
- F. Ground fault circuit interrupter (GFCI) receptacles shall be listed and comply with UL 943 requiring increased surge immunity, improved corrosion resistance, improved resistance to false tripping and diagnostic indication for miswiring if the line and load conductors are reversed during installation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install convenience receptacles at elevations indicated in the General Installation Notes on the contract drawings.
- B. Install specific-use receptacles at heights shown on the contract drawings. Install devices level, plumb, and square with building lines. Coordinate installation of adjacent devices of separate systems with common mounting heights, including lighting, power, systems, technology, and temperature control device rough-ins.
- C. Ground Fault Protection: Provide ground fault protection for all branch circuit breakers serving 120/208 receptacles and electrical outlets rated 50 amps or less single-phase and 100 amps or less three-phase in the following locations, as shown on drawings, or required by adopted code:
 - 1. Bathrooms, locker rooms, shower rooms
 - 2. Rooftops
 - 3. Interior/Exterior locations subject to damp/wet conditions
 - 4. When located within 6 feet of sinks, bathtubs, and shower stalls
 - 5. Plug-and-cord receptacles when the utilization appliance is located within 6 feet of a sink edge.
 - 6. Garages, accessory buildings, service bays
- D. Install receptacles vertically with ground slot up or where indicated on the drawings, horizontally with ground slot to the left.
- E. Install decorative plates on switch, receptacle, and blank outlets in finished areas, using jumbo size plates for outlets installed in masonry walls.
- F. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface-mounted outlets.
- G. Install devices and wall plates flush and level.
- H. Install nameplate identification to receptacle cover plates indicated. Identification shall identify panel name and circuit number. Refer to Specification Section 26 05 53 - Electrical Identification.
- I. Test receptacles for proper polarity, ground continuity and compliance with requirements.

END OF SECTION 262726

SECTION 26 51 19
LED LIGHTING

SECTION 26 51 19 - LED LIGHTING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Interior luminaires and accessories
- B. Exterior luminaires and accessories
- C. Light-emitting diode (LED) luminaire systems
- D. Emergency inverter for LED light engines (individual luminaires - integral)
- E. Lighting poles

1.2 RELATED SECTIONS

- A. The lighting system design includes a combination of luminaire sources, lighting control components, programming sequences, and supplementary components for building and energy code compliance. The design uses performance-based specifications for portions of the lighting system to account for the limitation of comparable product solutions available by competitive manufacturers. The Contractor shall reference related specification sections, plans, schedules, and details prior to submitting pricing, submittals, and installation. The Contractor shall coordinate system component compatibility among various manufacturers and suppliers for a turnkey lighting system. Referenced sections include, but are not limited to, the following:

- 1. 26 09 33 Lighting Control Systems
- 2. Electrical drawings: Plans, luminaire schedules, lighting control sequence of operations, diagrams, and details.

1.3 REFERENCES

- A. ANSI C78.377 - Specifications for the Chromaticity of Solid State Lighting Products
- B. ANSI C82.16 - Light-Emitting Diode Drivers - Method of Measurement
- C. ANSI C82.77 - Standard for Harmonic Emission Limits and Related Power Quality Requirements for Lighting Equipment
- D. NFPA 70E - National Electrical Safety Code
- E. NEMA SSL1 - Electronic Drivers for LED Devices, Arrays or System
- F. UL 8750 - Light Emitting Diode (LED) Equipment for use in Lighting Products
- G. LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products
- H. LM-80 - Measuring Luminous Flux and Color Maintenance of LED
- I. FS W-L-305 - Light Set, General Illumination (Emergency or Auxiliary)
- J. UL 924 - Standard for Emergency Lighting and Power Equipment

SECTION 26 51 19
LED LIGHTING

- K. UL676 Standard for Underwater Luminaires and Submersible Junction Box
- L. Project site classification as defined in IESNA RP-33 LZ2.

1.4 SUBMITTALS

- A. Submit product data under provisions of Section 26 05 00.
- B. Basic Requirements of Submittal:
 - 1. Submit product data sheets for luminaires, LED light engines, drivers and poles. Include complete product model number with all options as specified. Submittal shall be arranged with luminaires listed in ascending order, and with each luminaire's, LED light engine, driver, or pole information following luminaire's product data. Failure to organize submittal in this manner will result in the submittal being rejected.
 - 2. Submit lens product data, dimensions and weights if not included in product data sheet submittal.
 - 3. Include outline drawings, support points, weights, and accessory information for each luminaire.
 - 4. Submit manufacturer origin of LED chipset and driver.

1.5 EXTRA STOCK

- A. Provide extra stock under provisions of Section 26 05 00.
- B. LED Light Engines or Modules: Three (3) percent of quantity installed, minimum one (1) of each size and type of field replaceable light engine or module. Provide field replacement installation instructions.
- C. Lenses: Three (3) percent of quantity installed, minimum one (1) of each size and type.
- D. LED Drivers: Three (3) percent of quantity installed, minimum one (1) of each size and type.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site. Store and protect under provisions of Section 26 05 00.
- B. Protect luminaire finishes, lenses, and trims from damage during storage and installation. Do not remove protective films until construction cleanup within each area is complete.
- C. Handle site lighting poles carefully to prevent breakage and damage to finish.

1.7 WARRANTY

- A. The warranty period begins at the date of Substantial Completion.
- B. LED Light Engines and Drivers:
 - 1. LED Drivers and Dimming Drivers: Five (5) years
 - 2. Light Emitting Diode (LED) Light Engines: Five (5) years
- C. Emergency Drivers:
 - 1. Emergency LED Driver: Five (5) years

SECTION 26 51 19
LED LIGHTING

D. Emergency Inverter for LED Light Engines:

1. Emergency Inverter and Battery: Sealed nickel cadmium five (5) year, non-prorated.

1.8 REGULATORY REQUIREMENTS

- A. Conform to NFPA 101 for installation requirements.

PART 2 - PRODUCTS

2.1 INTERIOR LUMINAIRES AND ACCESSORIES - GENERAL

- A. Lensed Troffers: Provide hinged frames with latches and 0.125-inch thick virgin acrylic lenses. Prismatic lenses shall have depth of no less than 0.080", KSH12 or equal. Other lenses as scheduled.
- B. Luminaires: Louvers shall be anodized low iridescent specular aluminum with mitered corners and interlocking construction.
- C. Painted reflector surfaces shall have a minimum reflectance of 90%.
- D. All painted components shall be painted after fabrication.

2.2 EXTERIOR LUMINAIRES AND ACCESSORIES - GENERAL

- A. Listed for wet or damp location as scheduled. Provide ingress protection (IP) rating when scheduled.
- B. Provide low temperature LED drivers, with reliable starting to -20°F.
- C. Exterior LED luminaires shall contain separate, easily accessible and replaceable Category C surge protection device.

2.3 LIGHT EMITTING DIODE (LED) LUMINAIRE SYSTEMS

- A. Refer to the luminaire schedule for color temperature and minimum color rendering index CRI requirements. Provide light source color consistency by utilizing a binning tolerance within a maximum 3-step McAdam ellipse unless noted otherwise.
- B. LED chip arrays specified as color changing shall have chip colors as noted on the luminaire schedule.
- C. Rated life shall be minimum of 50,000 hours at L70.
- D. LED chips shall be wired so that failure of one chip does not prohibit operation of the remainder of the chip array.
- E. Luminaire delivered lumens is defined as the absolute lumens per the manufacturers LM-79-08 test report.
- F. LED luminaires shall be designed for ease of component replacement including modular replaceable boards or Zhaga sockets. Luminaires that are factory sealed and do not have field replaceable parts shall provide a 10-year warranty.
- G. LED light engine shall have a maximum LLD of 0.85 at 50,000 hours at 25°C ambient.

SECTION 26 51 19
LED LIGHTING

H. LED Driver:

1. Solid state driver with integral heat sink. Driver shall have over-heat, short-circuit and overload protection, power factor 0.90 or above and maximum total harmonic distortion of 20%. Driver shall have a voltage fluctuation tolerance of +/- 10%.
2. Drivers shall have dimming capabilities as outlined in the luminaire schedule for each luminaire type. Dimming shall control light output in a continuous curve from 100% to 10% unless noted otherwise.
3. Driver shall have a minimum of 50,000 hours rated life.
4. Driver shall be tested to ANSI C82-16 for input current inrush, total harmonic distortion (THD), and power factor. Driver start time shall be less than 0.5 seconds to 98% of initial light output. Flicker should be less than 30% throughout the operating range.
5. Driver shall be field replaceable without removal of the luminaire.
6. Class A sound rating; inaudible in a 27 dBA ambient.
7. Demonstrate no visible change in light output with a variation of plus or minus 10 percent change in line-voltage input.

2.4 EMERGENCY INVERTER FOR LED LIGHT ENGINES (INDIVIDUAL LUMINAIRES - INTEGRAL)

- A. Unit: Self-contained, with automatic transfer to battery supply on loss of normal power, UL 924 listed for factory or field installation, indoor and damp locations, 32°F to 122°F operating temperature. Compatible with switched, dimmed, and unswitched lighting controls. Compatible with LED light engines. The inverter output shall be sinusoidal with solid-state low voltage disconnect circuit.
- B. Battery: Sealed, high temperature, maintenance free, nickel cadmium battery with capacity to provide 90 minutes of emergency operation at full lumen and wattage output, with 24-hour recharge time. Refer to Luminaire Schedule for lumen and wattage requirements.
- C. Features: Integral battery charger with LED charging indicator light, test switch, electronic circuitry for use with LED drivers. Test and monitor switch shall be integral to luminaire.
- D. Factory and Field Installation: Listed for installation inside and adjacent to luminaire. Refer to Luminaire Schedule for individual luminaire requirements. Remote-mounted units shall be located above finished ceiling, adjacent to luminaire, and accessible from below through luminaire opening.
- E. Self-Test Diagnostics and Testing: Provide with listed automatic monthly self-test diagnostics.
- F. Manufacturers:
 1. Myers LVU Series

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Securely fasten luminaires to the listed and labeled ceiling framing member by mechanical means such as bolts, screws, rivets or listed clips identified for use with the type of ceiling framing members. The architectural ceiling framing system may be used in lieu of independent support with prior written approval by the ceiling system manufacturer and Authority Having Jurisdiction (AHJ). Luminaires and wiring installed in fire-rated ceiling assemblies shall be independently supported for all applications.

SECTION 26 51 19
LED LIGHTING

- B. Do not fasten luminaire supports to piping, ductwork, mechanical equipment, or conduit, unless otherwise noted. Support wires shall be tightly wrapped (minimum of three turns within 3 inches of the connection) and sharply bend to prevent vertical movement.
- C. Support suspended or pendant mounted luminaires independent of ceiling grid with adjustable stainless steel aircraft cables or per luminaire schedule mounting requirements. Suspension assembly and anchors shall be capable of supporting 300 pounds dead load at each suspension point.
- D. Support wire used to independently support luminaires, raceways, and wiring systems shall be distinguishable from ceiling support systems by color (field paint), tagging or equivalent means.

3.2 CONSTRUCTION USE OF PROJECT LUMINAIRES

- A. The Contractor shall provide temporary construction lighting per the requirements of Division 1.
- B. The project luminaires shown on the construction documents shall not be used for temporary construction purposes without providing a plan for Owner approval that addresses energy and luminaire operating hours.

3.3 RELAMPING

- A. Replace failed LED light engine modules or arrays at completion of work.

3.4 ADJUSTING AND CLEANING

- A. Align luminaires and clean lenses and diffusers at completion of work. Clean paint splatters, dirt, and debris from installed luminaires.

3.5 OWNER TRAINING

- A. Test emergency lighting equipment for 60 minutes to determine proper operation, prior to Substantial Completion, with the Owner's Representative.
- B. Provide electronic copy of periodic test log form to Owner's Representative. Explain and instruct Owner's Representative of requirements for testing and maintenance. Refer to latest adopted NFPA 101 for testing and logging requirements.

3.6 LUMINAIRE SCHEDULE

- A. As shown on the drawings.

END OF SECTION 265119

SECTION 28 31 00
FIRE ALARM AND DETECTION SYSTEMS

SECTION 28 31 00 - FIRE ALARM AND DETECTION SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Fire alarm and detection systems.

1.2 RELATED WORK

- A. Section 26 05 53 - Electrical Identification: Refer to electrical identification for color and identification labeling requirements.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in smoke detection and fire alarm systems with ten years' experience.
- B. Installer: A factory-authorized Electrical or Security Contractor licensed with the State and local jurisdiction with five years' experience in the design, installation, and maintenance of fire alarm systems by that manufacturer.
- C. Qualifications: The person managing/overseeing the preparation of shop drawings and the system installation/programming/testing shall be trained and certified by the system manufacturer and shall be Fire Alarm Certified by NICET, minimum Level 2. This person's name and certification number shall appear on the start-up and testing reports.

1.4 REFERENCES

- A. NFPA 70 - National Electrical Code (NEC)
- B. NFPA 72 - National Fire Alarm and Signaling Code
- C. NFPA 101 - Life Safety Code
- D. UL 2017 - General Purpose Signaling Devices and Systems
- E. UL 217 / 268 - Standard for Smoke Alarms / Smoke Detectors for Fire Alarm Systems

1.5 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 26 05 00 and as noted below.
 - 1. Failure to comply with all the following and all the provisions in 26 05 00 will result in the shop drawing submittal being rejected without review.
 - 2. Failure to submit the fire alarm without all requirements fulfilled in a single comprehensive submittal will be grounds to require a complete resubmittal.
- B. Provide product catalog data sheets as shop drawings.
 - 1. Provide a product catalog data sheet for each item shown on the Electrical Symbols List and for each piece of equipment that is not shown on the drawings, but required for the operation of the system.

SECTION 28 31 00
FIRE ALARM AND DETECTION SYSTEMS

2. Where a particular Electrical Symbols List item has one or more variations (such as those denoted by subscripts, etc.) a separate additional product catalog data sheet shall be provided for each variation that requires a different part number to be ordered. The corresponding Electrical Symbols List symbol shall be shown on the top of each sheet.
3. Where multiple items and options are shown on one data sheet, the part number and options of the item to be used shall be clearly denoted.

C. Submit CAD Floor Plans as Shop Drawings:

1. The complete layout of the entire system, device addresses, auxiliary equipment, and manufacturer's wiring requirements shall be shown.
2. A legend or key shall be provided to show which symbols shown on the submittal floor plans correspond with symbols shown on the Contract Documents.

D. About all fire alarm circuits, provide the following: manufacturer's wiring requirements (manufacturer, type, size, etc.) and voltage drop calculations.

E. Provide installation and maintenance manuals under provisions of Section 26 05 00.

F. Provide information on the system batteries as follows: total battery capacity, total capacity used by all devices on this project, total available future capacity.

G. Submit photocopy proof of NICET certification of the person overseeing the preparation of drawings and installation/testing.

H. When required to comply with local or state regulatory reviews, the fire alarm submittal shall have a Professional Engineer's stamp and signature of the state in which the project is completed. NOTE: The Architect/Engineer cannot stamp and seal submittal drawings not prepared under their supervision.

1.6 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Provide quantity equal to 2 percent (2%) of amount of each type installed, but no less than two (2) units of each type.
 - a. Smoke and heat detectors, manual pull stations, duct smoke detectors, monitor modules, control modules and relays.
 - b. Notification Appliances: Speakers, speaker strobes, and strobes.
2. Keys: The installing contractor shall collect all equipment spare keys provided with each lockable or resettable device/cabinet minimum of one (1) set each and shall turn over to the Owner upon completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 26 05 00.

B. Store and protect products under provisions of Section 26 05 00.

1.8 REGULATORY REQUIREMENTS

A. System: UL or FM Global listed.

SECTION 28 31 00
FIRE ALARM AND DETECTION SYSTEMS

- B. Conform to requirements of NFPA 101.
- C. Conform to requirements of Americans with Disabilities Act (ADA).
- D. Conform to UL 864 Fire Alarm, UL 1076 Security, UL2017 General Signaling, and UL 2572 Mass Notification Communications.

1.9 SYSTEM DESCRIPTION

- A. Performance Statement: This specification section and the accompanying fire alarm specific design documents describe the minimum material quality, required features, and operational requirements of the system. These documents do not convey every wire that must be installed and every equipment connection that must be made. Based on the equipment described and the performance required of the system, as presented in these documents, the Vendor and the Contractor are solely responsible for determining all wiring, programming and miscellaneous equipment required for a complete and operational system.
- B. This section of the specifications includes the furnishing, installation and connection of the microprocessor controlled, intelligent reporting, fire alarm equipment required to form a complete coordinated system that is ready for operation. It shall include, but is not limited to, alarm initiating devices, control panels, auxiliary control devices, annunciators, power supplies, and wiring as indicated on the drawings and specified herein.
- C. Extending the Existing Fire Alarm System: Provide all items, components, devices, hardware, software, programming, expansion components, conduit, wiring etc. needed to extend the existing fire alarm system. This includes, but is not limited to, additional power supplies, initiating devices and circuits, signaling devices and circuits, monitoring devices and circuits, auxiliary control and related devices such as, door holders and their control, smoke damper control, fan shutdown, etc. The existing fire alarm system shall be extended such that the existing fire alarm system's functionality, integrity and annunciation shall be equivalent to pre-construction conditions, unless noted otherwise. The functionality and integrity shall be maintained during construction. The entire system shall be able to be completely reset from any single reset location point. The entire system shall be annunciated at any annunciation location.
- D. Extending the Existing FIRE-LITE MS-5012 Fire Alarm System: The existing control panel shall remain and shall be operational throughout construction. The system shall only be disabled to make new connections and to modify the programming. A fire watch shall be provided for all areas affected during outages. All system outages must be scheduled with the Owner at least one week prior. Individual devices may be disabled as needed based on construction activities to reduce the potential for false alarms, but all devices must be operational when the Contractor is not physically on site. New initiating devices may be connected to the existing signaling line circuits where capacity is available. Provide additional signaling line circuits as needed based on existing and new device quantity, including replacement of existing panel components. Provide new notification circuits to serve the new devices, including all necessary power supplies, amplifiers, batteries, and 120-volt input circuits. All new devices shall be programmed to provide the same sequence of operation as the existing devices of the same type, unless noted otherwise.
- E. Fire Alarm System: NFPA 72; Automatic and manual fire alarm system, non-coded, analog-addressable with automatic sensitivity control of certain detectors, multiplexed signal transmission.
- F. Drawings: Only device layouts and some equipment have been shown on the contract drawings. Wiring and additional equipment to make a complete and functioning system has not been shown, but shall be submitted on the shop drawings.

SECTION 28 31 00
FIRE ALARM AND DETECTION SYSTEMS

1.10 PROJECT RECORD DOCUMENTS

- A. Submit documents under the provisions of Section 26 05 00.
- B. Include location of end-of-line devices.
- C. Provide a CAD drawing of each area of the building (minimum scale of 1/16" = 1'-0") showing each device on the project and its address. The devices shall be shown in their installed location and shall be labeled with the same nomenclature as is used in the fire alarm panel programming.

1.11 OPERATION AND MAINTENANCE DATA

- A. Submit data under provisions of Section 26 05 00.
- B. Include operating instructions, and maintenance and repair procedures.
- C. Include results of testing of all devices and functions.
- D. Include manufacturer's representative's letter stating that system is operational.
- E. Include the CAD floor plan drawings.
- F. Include shop drawings as reviewed by the Architect/Engineer and the local Authority Having Jurisdiction.

1.12 WARRANTY

- A. Provide one (1) year warranty on all materials and labor from Date of Substantial Completion.
- B. Warranty requirements shall include furnishing and installing all software upgrades issued by the manufacturer during the one (1) year warranty period.

1.13 ANNUAL INSPECTION/TESTING AND SERVICE CONTRACT

- A. The Owner may enter into a contract directly with the vendor after shop drawing submittals. This specification is not a contract between the Owner and the vendor to perform these services.

PART 2 - PRODUCTS

2.1 Fire Alarm Pathway Class and Survivability Level

- A. Pathway Class:
 - 1. Pathway Class B: Circuits NOT capable of transmitting an alarm beyond the location of the fault condition. Wiring of outgoing and return conductors is permitted to be run in the same conduit or cable.
 - 2. Pathway Class: SLC for addressable devices with less than 50 devices can be Class A or B, and more than 50 devices shall be Class A.
- B. Pathway Survivability Level:
 - 1. Pathway Survivability Level 0: Circuits have no requirements for pathway survivability beyond the requirements of the code.

SECTION 28 31 00
FIRE ALARM AND DETECTION SYSTEMS

2. Shared Pathway Designation Level 2: Provide physical segregation of all life safety and non-life safety data.

2.2 NOTIFICATION APPLIANCE DEVICES

- A. Combination Devices: Subscripts identify combination type devices when applicable. Contractor shall provide the combination device or provide multiple device(s) to meet the functionality when the manufacturer does not offer the required functionality with a single device.
- B. Notification Appliance Device(s):
 1. Subscripts: Subscripts are used to define the device type, installation, and identify the device with a specific sequence of operation.
 - a. Device types as follows:
 - 1) W = Weather Proof
 - 2) WG = Wire guard is required
 - 3) Candela Ratings:
 - a) ## = 15 Candela; 30 Candela; 75 Candela; 110 Candela; 177 Candela
 - b) CD = NICET designer shall select Candela rating as required to provide full coverage of the space.
- C. Notification Device(s):
 1. Wall Mounted: Red housing with white lettering or pictogram.
 2. Ceiling Mounted: White housing with red lettering or pictogram.
- D. FA-200; Visual Alarm Devices:
 1. Wall or ceiling mounted, refer to plans.
 2. High intensity (Candela rating as scheduled on the drawings) xenon strobe or equivalent under a lens. Candela rating shall be visible from exterior of the device.
 3. The maximum pulse duration shall be 0.2 seconds with a maximum duty cycle of 40%. The flash rate shall be 1 Hz. Where more than two strobes are visible from any one location, the fire alarm visual devices shall be synchronized.
 4. Device, housing, and backbox shall be UL listed for fire alarm/emergency applications.
 5. (W) Weatherproof Visual Notification Device: High intensity strobe, square housing, 75 Candela rating, suitable for wet locations. Provide with weatherproof back box.
 - a. Mounting: Semi-flush wall.
 - b. Conduit shall not be exposed.
- E. FA-210; Audio Horn Alarm Devices:
 1. Subscripts are used to define the device type, installation, and identify the device with a specific sequence of operation.
 2. Wall or ceiling mounted, refer to plans.
 3. Sound Rating: 85 dB at 10 feet. Sound levels for alarm signals shall not exceed 120 dBA in the occupied area.
 4. Device shall be capable of a high and low dB level setting. Unless noted otherwise, the device shall be set to the high setting at building completion.
 5. Device, housing, and backbox shall be UL listed for fire alarm/emergency applications.

SECTION 28 31 00
FIRE ALARM AND DETECTION SYSTEMS

F. FA-211; Combination Audio Horn and Visual Alarm Device:

1. Wall or ceiling mounted, refer to plans.
2. Combine audio and visual components into a single device. Refer to the corresponding paragraphs above for requirements of each component.
3. (W) Weatherproof Audio/Visual Notification Device: Electronic horn with high intensity strobe, square housing, 75 Candela, suitable for wet locations. Provide with weatherproof back box.
 - a. Mounting: Semi-flush wall.
 - b. Conduit shall not be exposed.

2.3 WIRING

A. Fire alarm wiring/cabling shall be furnished and installed by the Contractor in accordance with the manufacturer's recommendations and pursuant to National Fire Codes. Cabling shall be UL listed and labeled as complying with the Electrical Code for power-limited fire alarm signal service.

B. Fire Alarm Cable:

1. Manufacturers:
 - a. Comtran Corp.
 - b. Helix/HiTemp Cables, Inc.
 - c. Rockbestos-Suprenant Cable Corp.
 - d. West Penn Wire/CDT.
 - e. Radix.

PART 3 - EXECUTION

3.1 SEQUENCES OF FIRE ALARM OPERATION

A. General:

1. Refer to the Fire Alarm Operation Matrix on the drawings for basic requirements and system operation.
2. All system output programs assigned via control-by-event equations to be activated by the particular point in alarm shall be executed, and the associated system outputs (alarm notification appliances and/or relays) shall be activated.

B. Audible Alarms Sequence:

1. Audible alarms throughout the building shall sound.

C. Visual Alarms Sequence:

1. Visual alarms throughout the building shall flash.

3.2 INSTALLATION

A. Install system in accordance with manufacturer's instructions and referenced codes.

SECTION 28 31 00
FIRE ALARM AND DETECTION SYSTEMS

B. Devices:

1. General:

- a. All ceiling-mounted devices shall be located where shown on the reflected ceiling and floor plans. If not shown on the reflected ceiling or reflected floor drawings, the devices shall be installed in the relative locations shown on the floor drawings in a neat and uniform pattern.
- b. All devices shall be coordinated with luminaires, diffusers, sprinkler heads, piping and other obstructions to maintain a neat and operable installation. Mounting locations and spacing shall not exceed the requirements of NFPA 72.
- c. Where the devices are to be installed in a grid type ceiling system, the detectors shall be centered in the ceiling tile.
- d. The location of all fire alarm devices shall be coordinated with other devices mounted in the proximity. Where a conflict arises with other items or with architectural elements that will not allow the device to be mounted at the location or height shown, the Contractor shall notify the Architect/Engineer to coordinate a different acceptable location.

2. Per the requirements of NFPA, detector heads shall not be installed until after the final construction cleaning unless required by the local Authority Having Jurisdiction (AHJ). If detector heads must be installed prior to final cleaning (for partial occupancy, to monitor finished areas or as otherwise required by the AHJ), they shall not be installed until after the fire alarm panel is installed, with wires terminated, ready for operation. Any detector head installed prior to the final construction cleaning shall be removed and cleaned prior to closeout.

3. Notification Appliance Devices:

- a. Devices shall be located where shown on the drawings.
- b. Wall-mounted audio, visual and audio/visual alarm devices shall be mounted as denoted on the drawings.
- c. Where ceiling mounted visual alarm devices or combination audio/visual alarm devices are shown where the ceiling is greater than 30'-0" high, they shall be stem mounted so that the entire unit is below 30'-0". This does not apply to audio-only alarm devices.

C. Wiring:

1. Fire alarm wiring/cabling shall be provided by the Contractor in accordance with the manufacturer's recommendations and pursuant to National Fire Codes.
2. Wiring shall be installed in conduit. Refer to Identification Section 26 05 13 for color and identification requirements.
3. All junction boxes with SLC and NAC circuits shall be identified on cover. Refer to Identification Section 26 05 13 for color and identification requirements.
4. Fire Alarm Power Branch Circuits: Building wiring as specified in Section 26 05 13.
5. Notification Appliance Circuits shall provide the features listed below. These requirements may require separate circuits for visual and audible devices.
 - a. Fire alarm temporal audible notification for all audio appliances.
 - b. Synchronization of all visual devices where two or more devices are visible from the same location.
 - c. Ability to silence audible alarm while maintaining visual device operation.
6. Notification Appliance Circuits shall not span floors.
7. Signal line circuits connecting devices shall not span floors or.

SECTION 28 31 00
FIRE ALARM AND DETECTION SYSTEMS

8. No wiring other than that directly associated with fire alarm detection, alarm or auxiliary fire protection functions shall be in fire alarm conduits. Wiring splices shall be avoided to the extent possible, and if needed, they shall be made only in junction boxes, and enclosed by plastic wire nut type connectors. Transposing or changing color coding of wires shall not be permitted. All conductors in conduit containing more than one wire shall be labeled on each end, in all junction boxes, and at each device with "E-Z Markers" or equivalent. Conductors in cabinets shall be carefully formed and harnessed so that each drops off directly opposite to its terminal. Cabinet terminals shall be numbered and coded, and no unterminated conductors are permitted in cabinets or control panels. All controls, function switches, etc. shall be clearly labeled on all equipment panels.
- D. Fire Alarm Cabling Color Code: Provide circuit conductors with insulation color coding as follows, or using colored tape at each conductor termination and in each junction box.
1. Power Branch Circuit Conductors: In accordance with Section 26 05 53.
 2. Signaling Line Circuit: Overall red jacket with black and red conductors.
 3. DC Power Supply Circuit: Overall red jacket with violet and brown conductors.
 4. Notification Appliance Circuit: Overall red jacket with blue and white conductors.
 5. Door Release Circuit: Gray conductors.
 6. Central Station Trip Circuit: Orange conductors.
 7. Central Station Fire Alarm Loop: Black and white conductors.
- E. Devices surface mounted in finished areas shall be mounted on surface backboxes furnished by fire alarm equipment supplier. Backboxes shall be painted to match device, shall be the same shape and size as the device shall not have visible knockouts.
- F. Make conduit and wiring connections to door release devices, sprinkler flow and pressure switches, sprinkler valve monitor switches, fire suppression system control panels, duct analog smoke detectors and all other system devices shown or noted on the Contract Documents or required in the manufacturer's product data and shop drawings.
- 3.3 FIELD QUALITY CONTROL
- A. Field inspection and testing will be performed under provisions of Section 26 05 00.
- B. Test in accordance with NFPA 72, Chapter 14 and local fire department requirements. Submit documentation with O & M manuals in accordance with Section 14.6 of the Code.
- C. Contractor shall test and adjust the fire alarm system as follows:
1. Speaker taps shall be adjusted to the lowest tap setting which achieves a sound level higher than or equal to the greatest of the following:
 - a. 70dBA.
 - b. 15 dBA above ambient levels as indicated in NFPA 72 Table A.18.4.3.
 - c. 15 dBA above measured ambient. 5 dBA above the maximum measured sound level with duration of more than 60 seconds.
 - d. As specified on the drawings.
 2. Sound level measurement procedure shall meet the following requirements:
 - a. All measurements shall use the 'A' weighted, dBA, sound measurement scale.
 - b. All measurements shall be taken after furnishings, wall coverings and floor coverings are in place.
 - c. All measurements shall be taken after fixed equipment (HVAC units, etc.) producing ambient noise is installed and is in operation.

SECTION 28 31 00
FIRE ALARM AND DETECTION SYSTEMS

- d. Final ambient sound measurements shall be taken during occupancy and the units shall be re-adjusted at that time, if necessary.
- e. All sound level measurements shall be taken at a height of 5' above the finished floor level.
- f. Measurements shall be taken in every unique room. If there are multiple rooms, which have the identical dimensions and function, 10%, or a minimum of two (2) rooms shall be tested. The results from the rooms tested shall be averaged and the remaining rooms may be adjusted per the average.
- g. Measurements shall be taken on a 20' x 20' grid and the results for all points taken shall be averaged. If the room is smaller than 20' x 20' a minimum of two measurements are required.
- h. Measurements shall be taken halfway between speakers or halfway between a speaker and the wall. No measurements shall be taken at the extreme edges of the room, nor directly under speakers.

3.4 MANUFACTURER'S FIELD SERVICES

- A. Provide manufacturer's field services under provisions of Section 26 05 00.
- B. Include services of certified technician to supervise installation, adjustments, final connections, and system testing.
- C. Note that room numbers depicted on the architectural/engineering drawings will not necessarily reflect the actual room (signage) numbers that the Owner selects. Contractor and fire alarm manufacturer shall coordinate the actual room numbers as the Owner directs to identify each device. This list shall be a part of the floor plan record drawing to be turned in at the project closeout.
- D. Include the services to train up to three of the Owner's staff in operation, maintenance, and programming of the fire alarm system at the manufacturer's factory. Airfare and lodging expenses for the Owner's staff will be by the Owner.
- E. System Occupancy Adjustments: When requested by Owner within 12 months of date of Substantial Completion, provide on-site system adjustments to suit actual occupied conditions. For this purpose, provide up to two (2) site visits, four (4) hours each visit, outside normal occupancy hours.

3.5 SYSTEM TRAINING

- A. System training shall be performed under provisions of Section 26 05 00.
- B. Minimum on-site training times shall be:
 - 1. System Operators: One (1) day.

END OF SECTION 283100

INDEX OF DRAWINGS

GENERAL

G0.00	COVER SHEET	A1.01	FIRST FLOOR PLANS
G1.01	CODE DETAILS	A1.01A	FIRST FLOOR PLANS - ADMIN. BLDG
G1.02	CODE DETAILS	A1.02	SECOND FLOOR PLAN
G1.03	CODE DETAILS	A1.03	WALL SECTIONS
G1.04	CODE DETAILS	A1.04	ROOF PLAN AND DETAILS
G1.05	SPECIFICATIONS	A2.01	INTERIOR ELEVATIONS
		A5.01	DETAILS
C.01	EXISTING CONDITIONS	M0.00	HVAC COVER SHEET
C.02	REMOVALS	M1.01	LEVEL 1 PLANS - HVAC - MAINT
C.03	SITE PLAN	M3.00	HVAC ENLARGED PLANS
		M4.00	HVAC DETAILS
S1.01	STRUCTURAL	M6.00	HVAC SCHEDULES
S1.02	FOUNDATION DETAILS		

E0.00	ELECTRICAL COVER SHEET
E0.01	ELECTRICAL LIGHTING COVER SHEET
E1.01	LEVEL 1 PLAN - ELECTRICAL - MAINT
E6.00	ELECTRICAL SCHEDULES
P0.00	PLUMBING COVER SHEET
P1.00	UNDERFLOOR PLANS - PLUMBING - MAINT
P1.00A	UNDERFLOOR PLANS - PLUMBING - ADMIN
P1.01	LEVEL 1 PLANS - PLUMBING - MAINT
P1.01A	LEVEL 1 PLANS - PLUMBING - ADMIN
P1.02	LEVEL 2 PLANS - PLUMBING - MAINT
P3.00	PLUMBING ENLARGED PLANS
P3.01	PLUMBING ENLARGED PLANS
P3.02	PLUMBING ENLARGED PLANS
P4.00	PLUMBING DETAILS
P6.00	PLUMBING SCHEDULES

MAINTENANCE AND ADMIN. BUILDINGS

851 10TH AVENUE W

MILAN, IL

CODE SUMMARY

PROJECT WILL INCLUDE WORK TO REPLACE PLUMBING FIXTURES AND FINISHES BUT NOT REQUIRED TO BRING ALL AREAS TO ADA COMPLIANCE PER AHJ VIA EMAIL ON 2024.09.10.

001024643			
BUILDING DATA			
APPLICABLE CODE	IBC 2021		
USE GROUP	B		
CONSTRUCTION TYPE (TABLE 601)	EXISTING ASSUMED IIB		
EXISTING GROSS BUILDING FOOTPRINT	APPROX. 8,213 GSF		
ADDITION AREA	163 SF, NEW BLDG FOOTPRINT= 8,376 GSF		
AUTOMATIC FIRE SUSPESSION SYSTEM	NONE		
NUMBER OF STORIES	2		
FIRE-RESISTANCE RATINGS FOR BUILDING ELEMENTS			
BUILDING ELEMENT	RATING		
PRIMARY STRUCTURAL FRAME			
BEAMS	0 HR		
COLUMNS	0 HR		
BEARING WALLS			
EXTERIOR	0 HR		
INTERIOR	0 HR		
FLOOR CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS	0 HR		
ROOF CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS	0 HR		
MEANS OF EGRESS			
APPLICABLE CODE	IBC 2021		
DOOR/CORRIDOR EGRESS WIDTH	0.2/PERSON		
MAX. LENGTH OF EXIT ACCESS TRAVEL	200 FEET		
MAX. LENGTH OF COMMON PATH EGRESS TRAVEL	100 FEET		
MAX. LENGTH OF DEAD END CORRIDORS	50 FEET		
MINIMUM CORRIDOR WIDTH	44 INCHES		
APPLICABLE CODES			
2012 International Building Code (with local amendments) 2012 International Existing Building Code (with local amendments) 2012 International Fuel Gas Code (with local amendments) 2012 International Mechanical Code (with local amendments) 2012 International Property Maintenance Code (with local amendments) 2012 International Residential Code (with local amendments) 2021 International Energy Conservation Code per Illinois Energy Efficient Buildings Act (20 ILCS 3125/1) (with State amendments) 2011 National Electrical Code (with local amendments) State of Illinois Plumbing Code (225 ILCS 320) Fire Codes - Per Fire Protection District and/or QSEFM (2015 NFPA 101) Illinois Accessibility Code (410 ILCS 25) Rock Island County Subdivision Resolution (Adopted October 18, 1994) (PDF) Rock Island County Zoning Resolution (Amended Feb 15, 2022) (PDF) Rock Island County Stormwater Ordinance (PDF)			
OCCUPANCY CALCULATIONS			
FUNCTION OF SPACE	AREA	FLOOR AREA PER OCCUPANT (TABLE 1004.1.1)	OCCUPANCT LOAD
BUSINESS	9,487 SF	150 SF GROSS	56
MINIMUM PLUMBING FIXTURES			
BUSINESS	3 WATER CLOSETS	2 LAVATORIES	1 DRINKING FOUNTAIN, 1 SERVICE SINK
FIXTURES PROVIDED	2 WATER CLOSETS, 1 URINAL	3 LAVATORIES	1 DRINKING FOUNTAINS, 1 SERVICE SINK



Project Location Map

SEAL	I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly registered architect under the laws of the state of Iowa.
	JOHN GABRIELSON
	Printed Name
	<i>John Gabrielson</i>
	Signature
	Date
	11-30-2024
	10-21-2024
	Registration Expires
	Date Issued
	Pages or sheets covered by this seal:
	ALL G AND A SHEETS

SEAL	I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly registered civil engineer under the laws of the state of Illinois.
	MICHAEL G. DRYDEN
	Printed Name
	<i>Michael G. Dryden</i>
	Signature
	Date
	2024.10.21
	Registration Expires
	Date Issued
	Pages or sheets covered by this seal:
	ALL C SHEETS

SEAL	I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly registered structural engineer under the laws of the state of Illinois.
	MICHAEL R. LESLIE
	Printed Name
	<i>Michael R. Leslie</i>
	Signature
	Date
	11/30/2024
	9/20/2000
	Registration Expires
	Date Issued
	Pages or sheets covered by this seal:
	S1.01

SEAL	I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly registered engineer under the laws of the state of Illinois.
	Peter J. Courtney
	Printed Name
	<i>PJ Courtney</i>
	Signature
	Date
	2025.11.30
	Registration Expires
	Date Issued
	Pages or sheets covered by this seal:
	M0.00-M6.00, P0.00-P6.00

SEAL	I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly registered engineer under the laws of the state of Illinois.
	Matthew D. Snyder
	Printed Name
	<i>Matthew D. Snyder</i>
	Signature
	Date
	2025.11.30
	Registration Expires
	Date Issued
	Pages or sheets covered by this seal:
	E0.00-E6.00

REMARKS	BY	DATE	REV.	DESIGNED	DRAWN	REVIEWED	APPROVED
WILLETT HOFMANN & ASSOCIATES, INC. ENGINEERING ARCHITECTURE LAND SURVEYING 625 32ND AVE SW CEDAR RAPIDS, IA 52404 1-319-378-1401							
ROCK ISLAND CO MILAN FACILITY 851 10TH AVE W, MILAN, IL 61264 COVER SHEET							
This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hofmann & Associates, Inc.							
PHASE ☐ PRELIM ☐ PERMIT ☐ FINAL ☒ BID ☐ CONST							
WHA No. 1854D23							
DATE 10/21/2024							
SHEET No. GO.00							

ADA STANDARDS INFORMATION SHEET

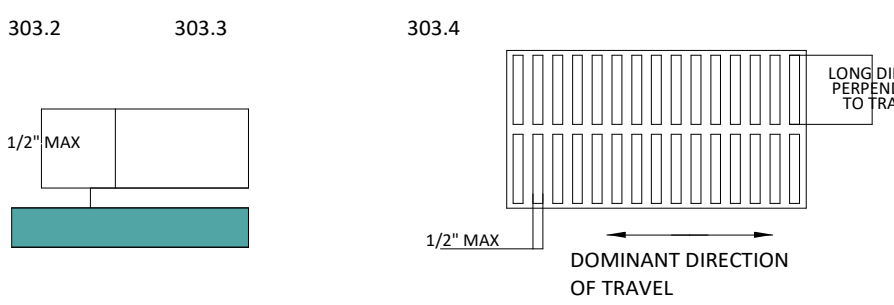
CHAPTER 3: BUILDING BLOCKS

302 FLOOR OR GROUND SURFACES

302.1 GENERAL. FLOOR AND GROUND SURFACES SHALL BE STABLE, FIRM, AND SLIP RESISTANT AND SHALL COMPLY WITH 302. EXCEPTIONS: (1) WITHIN ANIMAL CONTAINMENT AREAS, FLOOR AND GROUND SURFACES SHALL NOT BE REQUIRED TO BE STABLE, FIRM, AND SLIP RESISTANT. (2.) AREAS OF SPORT ACTIVITY SHALL NOT BE REQUIRED TO COMPLY WITH 302.

302.2 CARPET. CARPET OR CARPET TILE SHALL BE SECURELY ATTACHED AND SHALL HAVE A FIRM CUSHION, PAD, OR BACKING OR NO CUSHION OR PAD. CARPET OR CARPET TILE SHALL HAVE A LEVEL LOOP, TEXTURED LOOP, LEVEL CUT PILE, OR LEVEL CUT/UNCUT PILE TEXTURE. PILE HEIGHT SHALL BE 1/2" MAXIMUM. EXPOSED EDGES OF CARPET SHALL BE FASTENED TO FLOOR SURFACES AND SHALL HAVE TRIM ON THE ENTIRE LENGTH OF THE EXPOSED EDGE. CARPET EDGE TRIM SHALL COMPLY WITH 303.

302.3 OPENINGS. OPENINGS IN FLOOR OR GROUND SURFACES SHALL NOT ALLOW PASSAGE OF A SPHERE MORE THAN 1/2" DIAMETER EXCEPT AS ALLOWED IN 407.4.3, 409.4.3, 410.4, 810.5.3 AND 810.10. ELONGATED OPENINGS SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL



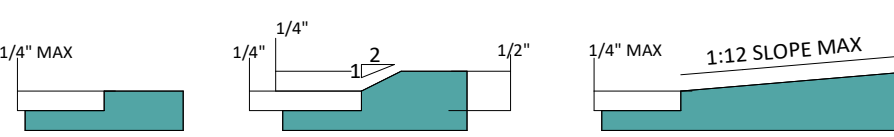
303 CHANGES IN LEVEL

303.1 GENERAL. WHERE CHANGES IN LEVEL ARE PERMITTED IN FLOOR OR GROUND SURFACES, THEY SHALL COMPLY WITH 303. EXCEPTIONS: 1.) ANIMAL CONTAINMENT AREAS SHALL NOT BE REQUIRED TO COMPLY WITH 303. 2.) AREAS OF SPORT ACTIVITY SHALL NOT BE REQUIRED TO COMPLY WITH 303.

303.2 VERTICAL. CHANGES IN LEVEL OF 1/4" HIGH MAXIMUM SHALL BE PERMITTED TO BE VERTICAL.

303.3 BEVELED. CHANGES IN LEVEL BETWEEN 1/4" HIGH MINIMUM AND 1/2" HIGH MAXIMUM SHALL BE BEVELED WITH A SLOPE NOT STEEPER THAN 1:2.

303.4 RAMPS. CHANGES IN LEVEL GREATER THAN 1/4" HIGH SHALL BE RAMPED, AND SHALL COMPLY WITH 405 OR 406.



304 TURNING SPACE

304.1 GENERAL. TURNING SPACE SHALL COMPLY WITH 304.

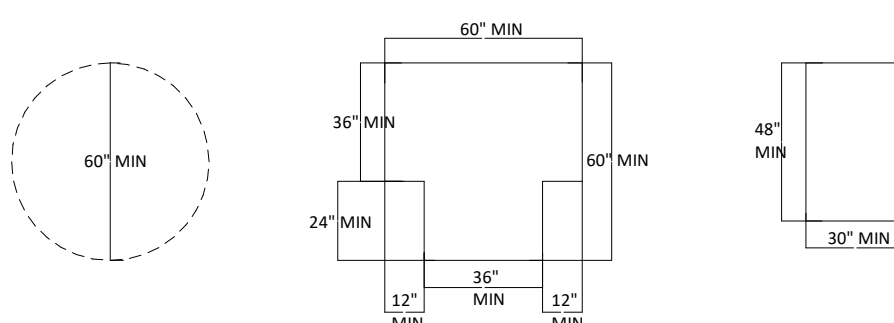
304.2 FLOOR OR GROUND SURFACES. FLOOR OR GROUND SURFACES OF A TURNING SPACE SHALL COMPLY WITH 302. CHANGES IN LEVEL ARE NOT PERMITTED. EXCEPTION: SLOPES NOT STEEPER THAN 1:48 SHALL BE PERMITTED.

304.3 SIZE. TURNING SPACE SHALL COMPLY WITH 304.3.1 OR 304.3.2.

304.3.1 CIRCULAR SPACE. THE TURNING SPACE SHALL BE A SPACE OF 60" DIAMETER MINIMUM. THE SPACE SHALL BE PERMITTED TO INCLUDE KNEE AND TOE CLEARANCE COMPLYING WITH 306.

304.3.2 T-SHAPED SPACE. THE TURNING SPACE SHALL BE A T-SHAPED SPACE WITHIN A 60" SQUARE MINIMUM WITH ARMS AND BASE 36" WIDE MINIMUM. EACH ARM OF THE T SHALL BE CLEAR OF OBSTRUCTIONS 12" MINIMUM IN EACH DIRECTION AND THE BASE SHALL BE CLEAR OF OBSTRUCTIONS 24" MINIMUM. THE SPACE SHALL BE PERMITTED TO INCLUDE KNEE AND TOE CLEARANCE COMPLYING WITH 306 ONLY AT THE END OF EITHER THE BASE OR ONE ARM.

304.4 DOOR SWING. DOORS SHALL BE PERMITTED TO SWING INTO TURNING SPACES.



305 CLEAR FLOOR OR GROUND SPACE

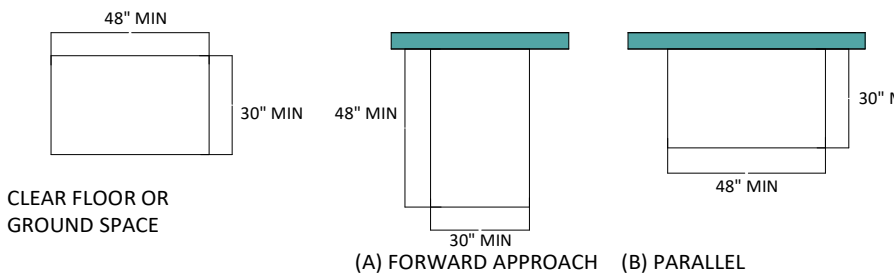
305.1 GENERAL. CLEAR FLOOR OR GROUND SPACE SHALL COMPLY WITH 305.

305.2 FLOOR OR GROUND SURFACES. FLOOR OR GROUND SURFACES OF A CLEAR FLOOR OR GROUND SPACE SHALL COMPLY WITH 302. CHANGES IN LEVEL ARE NOT PERMITTED. EXCEPTION: SLOPES NOT STEEPER THAN 1:48 SHALL BE PERMITTED.

305.3 SIZE. THE CLEAR FLOOR OR GROUND SPACE SHALL BE 30" MINIMUM BY 48" MINIMUM.

305.4 KNEE AND TOE CLEARANCE. UNLESS OTHERWISE SPECIFIED, CLEAR FLOOR OR GROUND SPACE SHALL BE PERMITTED TO INCLUDE KNEE AND TOE CLEARANCE COMPLYING WITH 306.

305.5 POSITION. UNLESS OTHERWISE SPECIFIED, CLEAR FLOOR OR GROUND SPACE SHALL BE POSITIONED FOR EITHER FORWARD OR PARALLEL APPROACH TO AN ELEMENT.

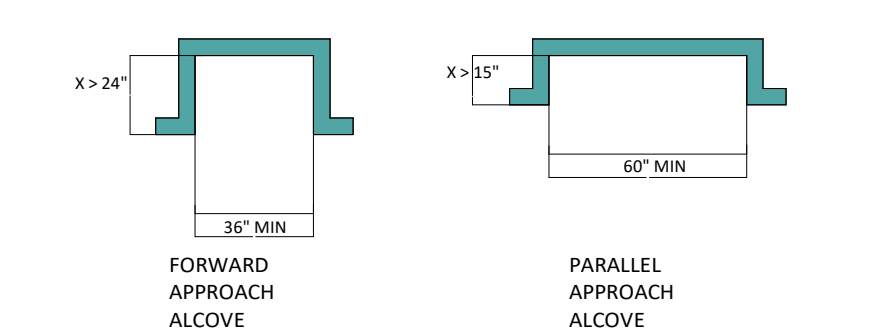


305.6 APPROACH. ONE FULL UNOBSTRUCTED SIDE OF THE CLEAR FLOOR OR GROUND SPACE SHALL ADJOIN AN ACCESSIBLE ROUTE OR ADJOIN ANOTHER CLEAR FLOOR OR GROUND SPACE.

305.7 MANEUVERING CLEARANCE. WHERE A CLEAR FLOOR OR GROUND SPACE IS LOCATED IN AN ALCOVE OR OTHERWISE CONFINED ON ALL OR PART OF THREE SIDES, ADDITIONAL MANEUVERING CLEARANCE SHALL BE PROVIDED IN ACCORDANCE WITH 305.7.1 AND 305.7.2.

305.7.1 FORWARD APPROACH. ALCOVES SHALL BE 36" WIDE MINIMUM WHERE THE DEPTH EXCEEDS 24".

305.7.2 PARALLEL APPROACH. ALCOVES SHALL BE 60" WIDE MINIMUM WHERE THE DEPTH EXCEEDS 15".



306 KNEE AND TOE CLEARANCE

306.1 GENERAL. WHERE SPACE BENEATH AN ELEMENT IS INCLUDED AS PART OF CLEAR FLOOR OR GROUND SPACE OR TURNING SPACE, THE SPACE SHALL COMPLY WITH 306. ADDITIONAL SPACE SHALL NOT BE PROHIBITED BENEATH AN ELEMENT BUT SHALL NOT BE CONSIDERED AS PART OF THE CLEAR FLOOR OR GROUND SPACE OR TURNING SPACE.

306.2 TOE CLEARANCE.

306.2.1 GENERAL. SPACE UNDER AN ELEMENT BETWEEN THE FINISH FLOOR OR GROUND AND 9" ABOVE THE FINISH FLOOR OR GROUND SHALL BE CONSIDERED TOE CLEARANCE AND SHALL COMPLY WITH 306.2.

306.2.2 MAXIMUM DEPTH. TOE CLEARANCE SHALL EXTEND 25" MAXIMUM UNDER AN ELEMENT.

306.2.3 MINIMUM REQUIRED DEPTH. WHERE TOE CLEARANCE IS REQUIRED AT AN ELEMENT AS PART OF A CLEAR FLOOR SPACE, THE TOE CLEARANCE SHALL EXTEND 17" MINIMUM UNDER THE ELEMENT.

306.2.4 ADDITIONAL CLEARANCE. SPACE EXTENDING GREATER THAN 6" BEYOND THE AVAILABLE KNEE CLEARANCE AT 9" ABOVE THE FINISH FLOOR OR GROUND SHALL NOT BE CONSIDERED TOE CLEARANCE.

306.2.5 WIDTH. TOE CLEARANCE SHALL BE 30" WIDE MINIMUM.

306.3 KNEE CLEARANCE.

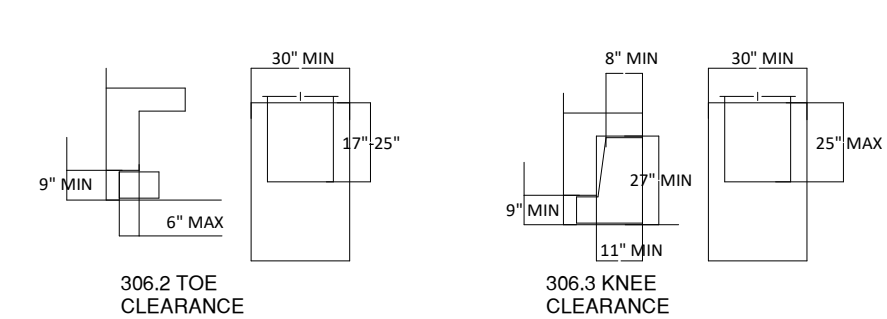
306.3.1 GENERAL. SPACE UNDER AN ELEMENT BETWEEN 9" AND 27" ABOVE THE FINISH FLOOR OR GROUND SHALL BE CONSIDERED KNEE CLEARANCE AND SHALL COMPLY WITH 306.3.

306.3.2 MAXIMUM DEPTH. KNEE CLEARANCE SHALL EXTEND 25" MAXIMUM UNDER AN ELEMENT AT 9" ABOVE THE FINISH FLOOR OR GROUND.

306.3.3 MINIMUM REQUIRED DEPTH. WHERE KNEE CLEARANCE IS REQUIRED UNDER AN ELEMENT AS PART OF A CLEAR FLOOR SPACE, THE KNEE CLEARANCE SHALL BE 11" DEEP MINIMUM AT 9" ABOVE THE FINISH FLOOR OR GROUND, AND 8" DEEP MINIMUM AT 27" ABOVE THE FINISH FLOOR OR GROUND.

306.3.4 CLEARANCE REDUCTION. BETWEEN 9" AND 27" ABOVE THE FINISH FLOOR OR GROUND, THE KNEE CLEARANCE SHALL BE PERMITTED TO REDUCE AT A RATE OF 1" IN DEPTH FOR EACH 6" IN HEIGHT.

306.3.5 WIDTH. KNEE CLEARANCE SHALL BE 30" WIDE MINIMUM.

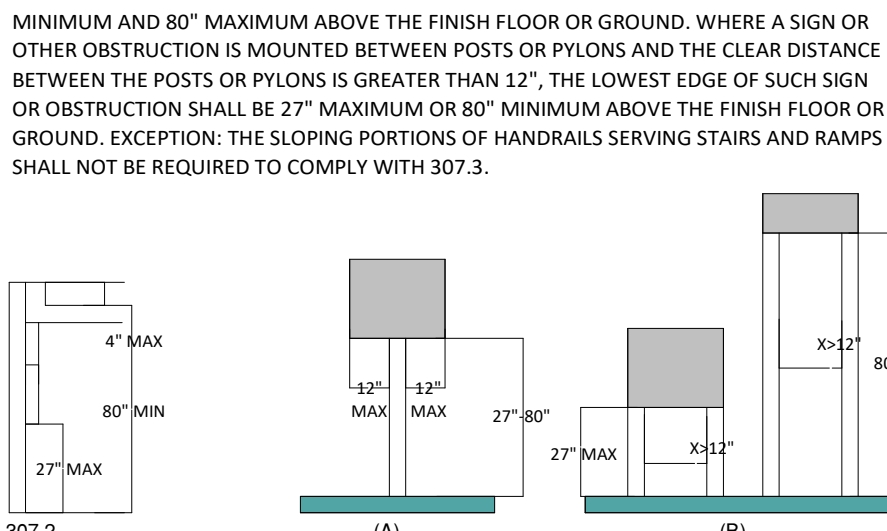


307 PROTRUDING OBJECTS

307.1 GENERAL. PROTRUDING OBJECTS SHALL COMPLY WITH 307.

307.2 PROTRUSION LIMITS. OBJECTS WITH SLANT EDGES MORE THAN 27" AND NOT MORE THAN 80" ABOVE THE FINISH FLOOR OR GROUND, PROTRUDE 4" MAXIMUM HORIZONTALLY INTO THE CIRCULATION PATH. EXCEPTION: HANDRAILS SHALL BE PERMITTED TO PROTRUDE 4 1/2" MAXIMUM.

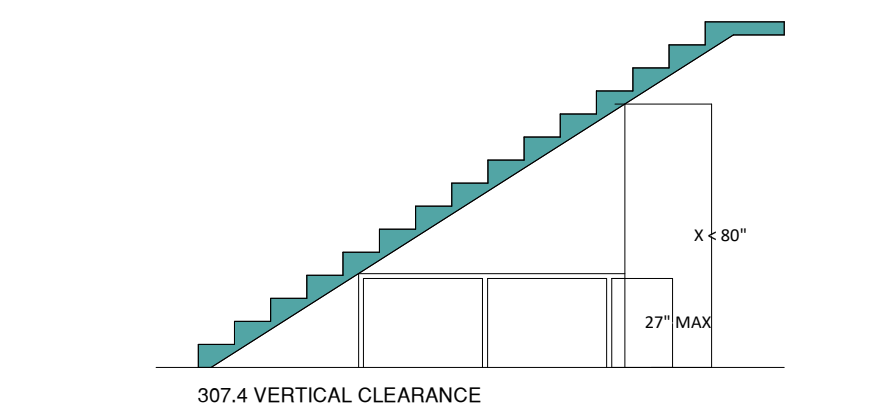
307.3 POST-MOUNTED OBJECTS. FREE-STANDING OBJECTS MOUNTED ON POSTS OR PYLONS SHALL OVERHANG CIRCULATION PATHS 12" MAXIMUM WHEN LOCATED 27" MINIMUM AND 80" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. WHERE A SIGN OR OTHER OBSTRUCTION IS MOUNTED BETWEEN POSTS OR PYLONS AND THE CLEAR DISTANCE BETWEEN THE POSTS OR PYLONS IS GREATER THAN 12", THE LOWEST EDGE OF SUCH SIGN OR OBSTRUCTION SHALL BE 27" MAXIMUM OR 80" MINIMUM ABOVE THE FINISH FLOOR OR GROUND. EXCEPTION: THE SLOPING PORTIONS OF HANDRAILS SERVING STAIRS AND RAMPS SHALL NOT BE REQUIRED TO COMPLY WITH 307.3.



307.4 VERTICAL CLEARANCE

307.4.1 GENERAL. VERTICAL CLEARANCE SHALL BE 80" HIGH MINIMUM. GUARDRAILS OR OTHER BARRIERS SHALL BE PROVIDED WHERE THE VERTICAL CLEARANCE IS LESS THAN 80" HIGH. THE LEADING EDGE OF SUCH GUARDRAIL OR BARRIER SHALL BE LOCATED 27" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. EXCEPTION: DOOR CLOSERS AND DOOR STOPS SHALL BE PERMITTED TO BE 78" MINIMUM ABOVE THE FINISH FLOOR OR GROUND.

307.5 REQUIRED CLEAR WIDTH. PROTRUDING OBJECTS SHALL NOT REDUCE THE CLEAR WIDTH REQUIRED FOR ACCESSIBLE ROUTES.

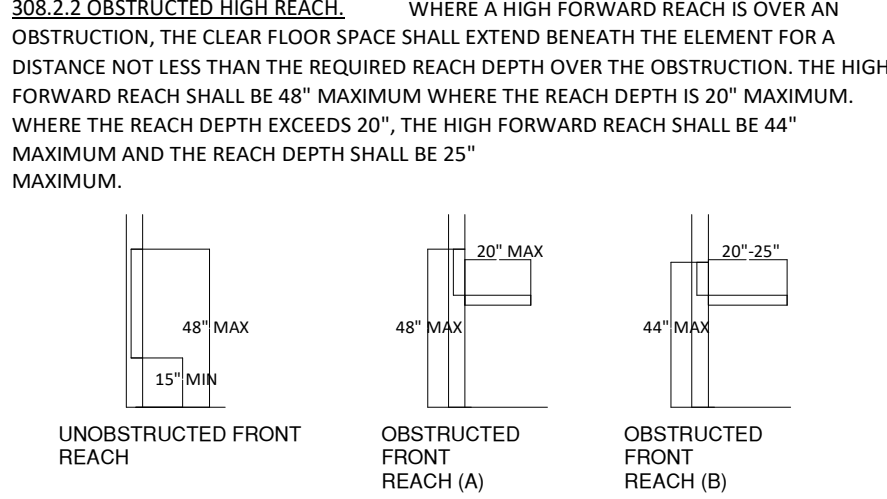


308 REACH RANGES

308.1 GENERAL. REACH RANGES SHALL COMPLY WITH 308.

308.2 FORWARD REACH. WHERE A FORWARD REACH IS UNOBSTRUCTED, THE HIGH FORWARD REACH SHALL BE 48" MAXIMUM AND THE LOW FORWARD REACH SHALL BE 15" MINIMUM ABOVE THE FINISH FLOOR OR GROUND.

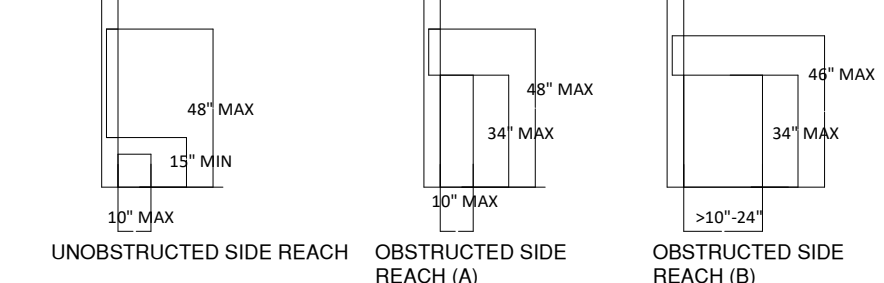
308.2.2 OBSTRUCTED HIGH REACH. WHERE A HIGH FORWARD REACH IS OVER AN OBSTRUCTION, THE CLEAR FLOOR SPACE SHALL EXTEND BENEATH THE ELEMENT FOR A DISTANCE NOT LESS THAN THE REQUIRED REACH DEPTH OVER THE OBSTRUCTION. THE HIGH FORWARD REACH SHALL BE 48" MAXIMUM WHERE THE REACH DEPTH IS 20" MAXIMUM. WHERE THE REACH DEPTH EXCEEDS 20", THE HIGH FORWARD REACH SHALL BE 44" MAXIMUM AND THE REACH DEPTH SHALL BE 25" MAXIMUM.



308.3 SIDE REACH

308.3.1 UNOBSTRUCTED. WHERE A CLEAR FLOOR OR GROUND SPACE ALLOWS A PARALLEL APPROACH TO AN ELEMENT AND THE SIDE REACH IS UNOBSTRUCTED, THE HIGH SIDE REACH SHALL BE 48" MAXIMUM AND THE LOW SIDE REACH SHALL BE 15" MINIMUM. THERE SHALL BE NO PROJECTIONS INTO THE REQUIRED CLEAR OPENING WIDTH LOWER THAN 34" ABOVE THE FINISH FLOOR OR GROUND. PROJECTIONS INTO THE CLEAR OPENING WIDTH BETWEEN 34" AND 80" ABOVE THE FINISH FLOOR OR GROUND SHALL NOT EXCEED 4" EXCEPTIONS: (1.) IN ALTERATIONS, A PROJECTION OF 5/8" MAXIMUM INTO THE REQUIRED CLEAR WIDTH SHALL BE PERMITTED FOR THE LATCH SIDE STOP. (2.) DOOR CLOSERS AND DOOR STOPS SHALL BE PERMITTED TO BE 78" MINIMUM ABOVE THE FINISH FLOOR OR GROUND.

308.3.2 OBSTRUCTED HIGH REACH. WHERE A CLEAR FLOOR OR GROUND SPACE ALLOWS A PARALLEL APPROACH TO AN ELEMENT AND THE HIGH SIDE REACH IS OVER AN OBSTRUCTION, THE HEIGHT OF THE OBSTRUCTION SHALL BE 34" MAXIMUM AND THE DEPTH OF THE OBSTRUCTION SHALL BE 24" MAXIMUM. THE HIGH SIDE REACH SHALL BE 48" MAXIMUM FOR A REACH DEPTH OF 10" MAXIMUM. WHERE THE REACH DEPTH EXCEEDS 10", THE HIGH SIDE REACH SHALL BE 46" MAXIMUM FOR A REACH DEPTH OF 24" MAXIMUM. EXCEPTIONS: (1.) THE TOP OF WASHING MACHINES AND CLOTHES DRYERS SHALL BE PERMITTED TO BE 36" MAXIMUM ABOVE THE FINISH FLOOR. (2.) OPERABLE PARTS OF FUEL DISPENSERS SHALL BE PERMITTED TO BE 54" MAXIMUM MEASURED FROM THE SURFACE OF THE VEHICULAR WAY WHERE FUEL DISPENSERS ARE INSTALLED ON EXISTING CURBS.



309 OPERABLE PARTS

309.1 GENERAL. OPERABLE PARTS SHALL COMPLY WITH 309.

309.2 CLEAR FLOOR SPACE. A CLEAR FLOOR OR GROUND SPACE COMPLYING WITH 305 SHALL BE PROVIDED.

309.3 HEIGHT. OPERABLE PARTS SHALL BE PLACED WITHIN ONE OR MORE OF THE REACH RANGES SPECIFIED IN 308.

309.4 OPERATION. OPERABLE PARTS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE OPERABLE PARTS SHALL BE 5 POUNDS MAXIMUM. EXCEPTION: GAS PUMP NOZZLES SHALL NOT BE REQUIRED TO PROVIDE OPERABLE PARTS THAT HAVE AN ACTIVATING FORCE OF 5 POUNDS MAXIMUM.

CHAPTER 4: ACCESSIBLE ROUTES

402 ACCESSIBLE ROUTES

402.1 GENERAL. ACCESSIBLE ROUTES SHALL COMPLY WITH 402.

402.2 COMPONENTS. ACCESSIBLE ROUTES SHALL CONSIST OF ONE OR MORE OF THE FOLLOWING COMPONENTS: WALKING SURFACES WITH A RUNNING SLOPE NOT STEEPER THAN 1:20, DOORWAYS, RAMPS, CURB RAMPS EXCLUDING THE FLARED SIDES, ELEVATORS, AND PLATFORM LIFTS. ALL COMPONENTS OF AN ACCESSIBLE ROUTE SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF CHAPTER 4.

403 WALKING SURFACES

403.1 GENERAL. WALKING SURFACES THAT ARE A PART OF AN ACCESSIBLE ROUTE SHALL COMPLY WITH 403.

403.2 FLOOR OR GROUND SURFACE. FLOOR OR GROUND SURFACES SHALL COMPLY WITH 302.

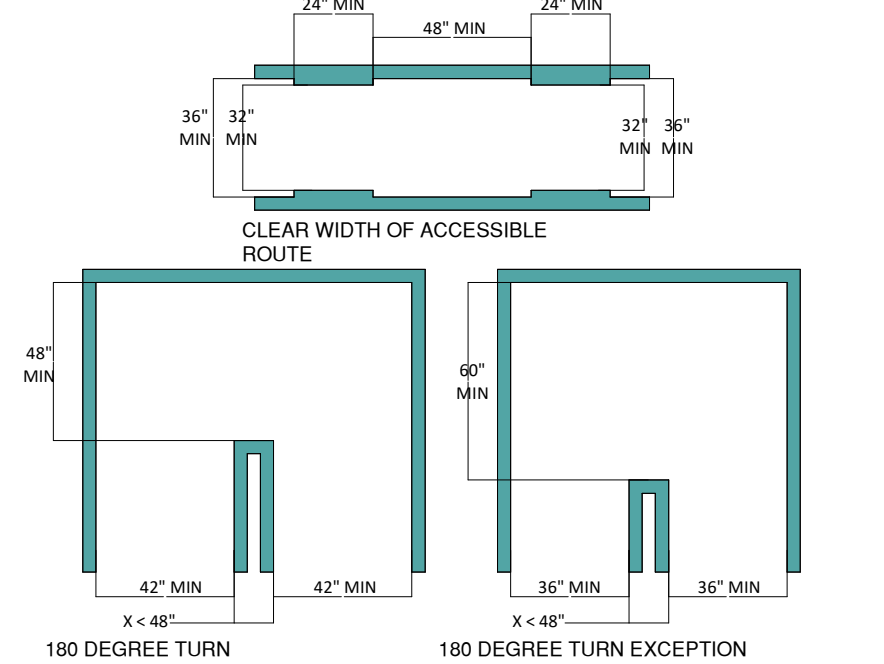
403.3 SLOPE. THE RUNNING SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:20. THE CROSS SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:48.

403.4 CHANGES IN LEVEL. CHANGES IN LEVEL SHALL COMPLY WITH 303.

403.5 CLEARANCES. WALKING SURFACES SHALL PROVIDE CLEARANCES COMPLYING WITH 403.5. EXCEPTION: WITHIN EMPLOYEE WORK AREAS, CLEARANCES ON COMMON USE CIRCULATION PATHS SHALL BE PERMITTED TO BE DECREASED BY WORK AREA EQUIPMENT PROVIDED THAT THE DECREASE IS ESSENTIAL TO THE FUNCTION OF THE WORK BEING PERFORMED.

403.5.1 CLEAR WIDTH. EXCEPT AS PROVIDED IN 403.5.2 AND 403.5.3, THE CLEAR WIDTH OF WALKING SURFACES SHALL BE 36" MINIMUM. EXCEPTION: THE CLEAR WIDTH SHALL BE PERMITTED TO BE REDUCED TO 32" MINIMUM FOR A LENGTH OF 24" MAXIMUM PROVIDED THAT REDUCED WIDTH SEGMENTS ARE SEPARATED BY SEGMENTS THAT ARE 48" LONG MINIMUM AND 36" WIDE MINIMUM.

403.5.2 CLEAR WIDTH AT TURN. WHERE THE ACCESSIBLE ROUTE MAKES A 180 DEGREE TURN AROUND AN ELEMENT WHICH IS LESS THAN 48" WIDE, CLEAR WIDTH SHALL BE 42" MINIMUM APPROACHING THE TURN, 48" MINIMUM AT THE TURN AND 4" MINIMUM LEAVING THE TURN. EXCEPTION: WHERE THE CLEAR WIDTH AT THE TURN IS 60" MINIMUM COMPLIANCE WITH 403.5.2 SHALL NOT BE REQUIRED.



403.5.3 PASSING SPACES

403.5.3.1 AN ACCESSIBLE ROUTE WITH A CLEAR WIDTH LESS THAN 60" SHALL PROVIDE PASSING SPACES AT INTERVALS OF 200' MAXIMUM. PASSING SPACES SHALL BE EITHER: A SPACE 60" MINIMUM BY 60" MINIMUM; OR, AN INTERSECTION OF TWO WALKING SURFACES PROVIDING A T-SHAPED SPACE COMPLYING WITH 304.3.2 WHERE THE BASE AND ARMS OF THE T-SHAPED SPACE EXTEND 48" MINIMUM BEYOND THE INTERSECTION.

403.6 HANDRAILS. WHERE HANDRAILS ARE PROVIDED ALONG WALKING SURFACES WITH RUNNING SLOPES NOT STEEPER THAN 1:20 THEY SHALL COMPLY WITH 505.

404 DOORS, DOORWAYS, AND GATES

404.1 GENERAL. DOORS, DOORWAYS, AND GATES THAT ARE PART OF AN ACCESSIBLE ROUTE SHALL COMPLY WITH 404. EXCEPTION: DOORS, DOORWAYS, AND GATES DESIGNED TO BE OPERATED ONLY BY SECURITY PERSONNEL SHALL NOT BE REQUIRED TO COMPLY WITH 404.2.7, 404.2.8, 404.2.9, 404.3.2 AND 404.3.4 THROUGH 404.3.7.

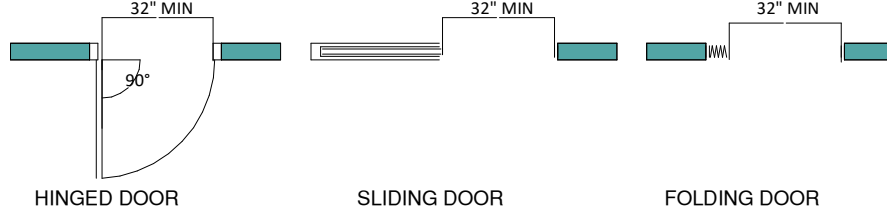
404.2 MANUAL DOORS, DOORWAYS, AND MANUAL GATES. MANUAL DOORS AND DOORWAYS AND MANUAL GATES INTENDED FOR USER PASSAGE SHALL COMPLY WITH 404.2.

404.2.1 REVOLVING DOORS, GATES, AND TURNSTILES. REVOLVING DOORS, REVOLVING GATES, AND TURNSTILES SHALL NOT BE PART OF AN ACCESSIBLE ROUTE.

404.2.2 DOUBLE-LEAF DOORS AND GATES. AT LEAST ONE OF THE ACTIVE LEAVES OF DOORWAYS WITH TWO LEAVES SHALL COMPLY WITH 404.2.3 AND 404.2.4.

404.2.3 CLEAR WIDTH

DOOR OPENINGS SHALL PROVIDE A CLEAR WIDTH OF 32" MINIMUM. CLEAR OPENINGS OF DOORWAYS WITH SWINGING DOORS SHALL BE MEASURED BETWEEN THE FACE OF THE DOOR AND THE STOP, WITH THE DOOR OPEN 90 DEGREES. OPENINGS MORE THAN 24" DEEP SHALL PROVIDE A CLEAR OPENING OF 36" MINIMUM. THERE SHALL BE NO PROJECTIONS INTO THE REQUIRED CLEAR OPENING WIDTH LOWER THAN 34" ABOVE THE FINISH FLOOR OR GROUND. PROJECTIONS INTO THE CLEAR OPENING WIDTH BETWEEN 34" AND 80" ABOVE THE FINISH FLOOR OR GROUND SHALL NOT EXCEED 4" EXCEPTIONS: (1.) IN ALTERATIONS, A PROJECTION OF 5/8" MAXIMUM INTO THE REQUIRED CLEAR WIDTH SHALL BE PERMITTED FOR THE LATCH SIDE STOP. (2.) DOOR CLOSERS AND DOOR STOPS SHALL BE PERMITTED TO BE 78" MINIMUM ABOVE THE FINISH FLOOR OR GROUND.



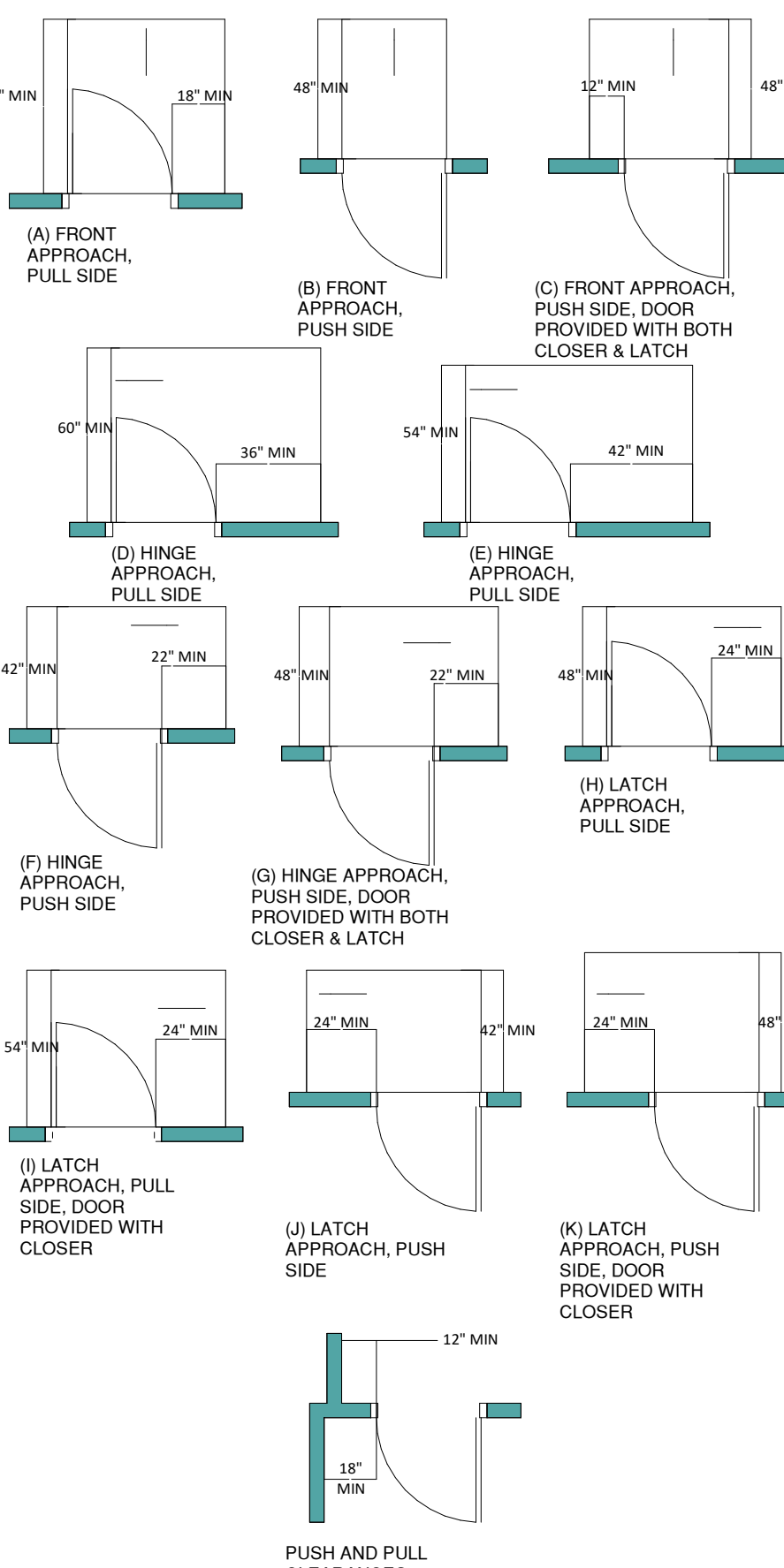
404.2.4 MANEUVERING CLEARANCES

MINIMUM MANEUVERING CLEARANCES AT DOORS AND GATES SHALL COMPLY WITH 404.2.4. MANEUVERING CLEARANCES SHALL EXTEND THE FULL WIDTH OF THE DOORWAY AND THE REQUIRED LATCH SIDE OR HINGE SIDE CLEARANCE. EXCEPTION: ENTRY DOORS TO HOSPITAL PATIENT ROOMS SHALL NOT BE REQUIRED TO PROVIDE THE CLEARANCE BEYOND THE LATCH SIDE OF THE DOOR.

404.2.4.1 SWINGING DOORS AND GATES. SWINGING DOORS AND GATES SHALL HAVE MANEUVERING CLEARANCES COMPLYING WITH TABLE 404.2.4.1.

TYPE OF USE		MINIMUM MANEUVERING CLEARANCE	
APPROACH DIRECTION	DOOR OR GATE SIDE	PERPENDICULAR TO DOORWAY	PARALLEL TO DOORWAY (BEYOND LATCH SIDE UNLESS NOTED)
FROM FRONT	PULL	60"	18"
FROM FRONT	PUSH	48"	0"
FROM HINGE SIDE	PULL	60"	36"
FROM HINGE SIDE	PULL	54"	42"
FROM HINGE SIDE	PUSH	42"	22"
FROM LATCH SIDE	PULL	48"	24"
FROM LATCH SIDE	PUSH	42"	24"

1. ADD 12" IF CLOSER AND LATCH ARE PROVIDED.
2. ADD 6" IF CLOSER AND LATCH ARE PROVIDED.
3. BEYOND HINGE SIDE.
4. ADD 6" IF CLOSER IS PROVIDED.

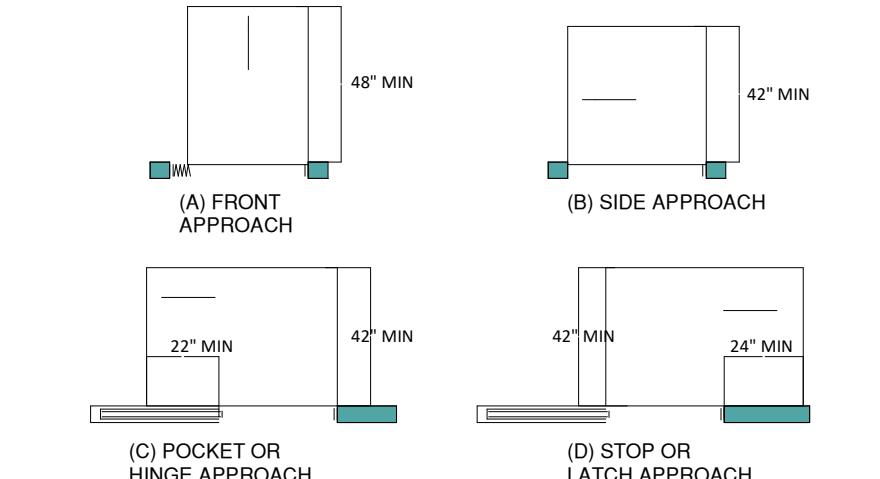


404.2.4.2 DOORWAYS WITHOUT DOORS OR GATES, SLIDING DOORS, AND FOLDING DOORS

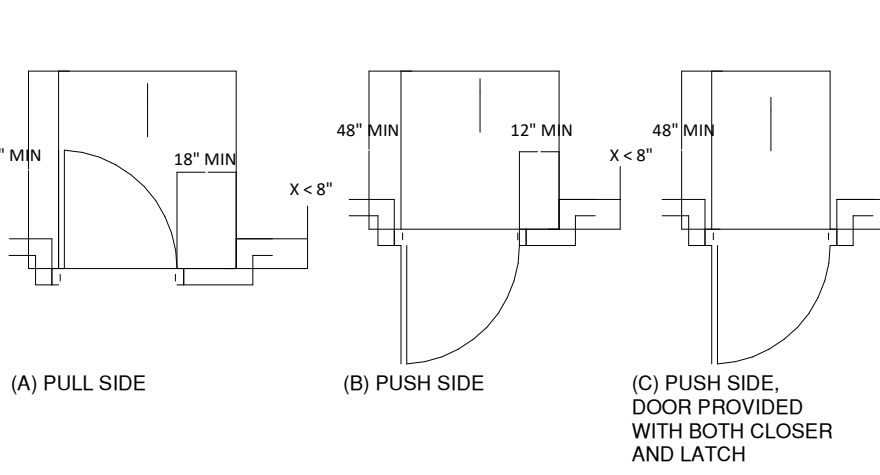
DOORWAYS LESS THAN 36" WIDE WITHOUT DOORS OR GATES, SLIDING DOORS, OR FOLDING DOORS SHALL HAVE MANEUVERING CLEARANCES COMPLYING WITH TABLE 404.2.4.2.

MINIMUM MANEUVERING CLEARANCE		
APPROACH DIRECTION	PERPENDICULAR TO DOORWAY	PARALLEL TO DOORWAY (BEYOND STOP/LATCH SIDE UNLESS NOTED)
FROM FRONT	48"	0"
FROM SIDE	42"	0"
FROM POCKET/HINGE SIDE	42"	22"
FROM STOP/LATCH SIDE	42"	24"

1. DOORWAY WITH NO DOOR ONLY.
2. BEYOND POCKET/HINGE SIDE.



404.2.4.3 RECESSED DOORS AND GATES. MANEUVERING CLEARANCES FOR FORWARD APPROACH SHALL BE PROVIDED WHEN ANY OBSTRUCTION WITHIN 18" OF THE LATCH SIDE OF A DOORWAY PROJECTS MORE THAN 8" BEYOND THE FACE OF THE DOOR, MEASURED PERPENDICULAR TO THE FACE OF THE DOOR OR GATE.

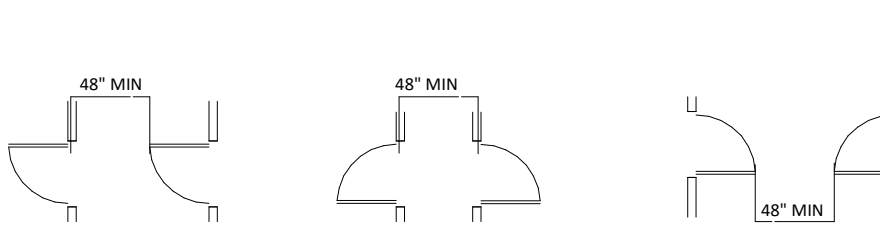


404.2.4.4 FLOOR OR GROUND SURFACE

FLOOR OR GROUND SURFACE WITHIN REQUIRED MANEUVERING CLEARANCES SHALL COMPLY WITH 302. CHANGES IN LEVEL ARE NOT PERMITTED. EXCEPTIONS: (1.) SLOPES NOT STEEPER THAN 1:48 SHALL BE PERMITTED. (2.) CHANGES IN LEVEL AT THRESHOLDS COMPLYING WITH 404.2.5 SHALL BE PERMITTED.

404.2.5 THRESHOLDS. THRESHOLDS, IF PROVIDED AT DOORWAYS, SHALL BE 1/2" HIGH MAXIMUM. RAISED THRESHOLDS AND CHANGES IN LEVEL AT DOORWAYS SHALL COMPLY WITH 302 AND 303. EXCEPTION: EXISTING OR ALTERED THRESHOLDS 3/4" HIGH MAXIMUM THAT HAVE A BEVELED EDGE ON EACH SIDE WITH A SLOPE NOT STEEPER THAN 1:2 SHALL NOT BE REQUIRED TO COMPLY WITH 404.2.5.

404.2.6 DOORS IN SERIES AND GATES IN SERIES. THE DISTANCE BETWEEN TWO HINGED OR PIVOTED DOORS IN SERIES AND GATES IN SERIES SHALL BE 48 INCHES (1220 MM) MINIMUM PLUS THE WIDTH OF DOORS OR GATES SWINGING INTO THE SPACE.



404.2.7 DOOR AND GATE HARDWARE

HANDLES, PULLS, LATCHES, LOCKS, AND OTHER OPERABLE PARTS ON DOORS AND GATES SHALL COMPLY WITH 309.4. OPERABLE PARTS OF SUCH HARDWARE SHALL BE 34" MINIMUM AND 48" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. WHERE SLIDING DOORS ARE IN THE FULLY OPEN POSITION, OPERATING HARDWARE SHALL BE EXPOSED AND USABLE FROM BOTH SIDES.

404.2.8 CLOSING SPEED. DOOR AND GATE CLOSING SPEED SHALL COMPLY WITH 404.2.8.

404.2.8.1 DOOR CLOSERS AND GATE CLOSERS. DOOR CLOSERS AND GATE CLOSERS SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 90 DEGREES, THE TIME REQUIRED TO MOVE THE DOOR TO A POSITION OF 12 DEGREES FROM THE LATCH IS 5 SECONDS MINIMUM.

404.2.8.2 SPRING HINGES. DOOR AND GATE SPRING HINGES SHALL BE ADJUSTED SO THAT FROM THE OPEN POSITION OF 70 DEGREES, THE DOOR OR GATE SHALL MOVE TO THE CLOSED POSITION IN 1.5 SECONDS MINIMUM.

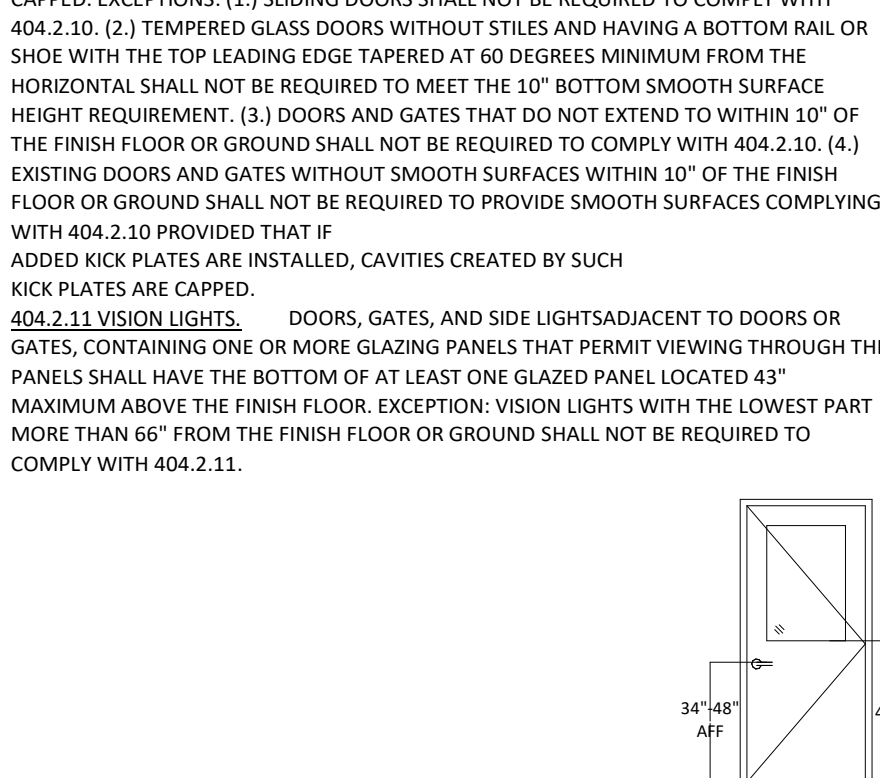
404.2.9 DOOR AND GATE OPENING FORCE. FIRE DOORS SHALL HAVE A MINIMUM OPENING FORCE ALLOWABLE BY THE APPROPRIATE ADMINISTRATIVE AUTHORITY. THE FORCE FOR PUSHING OR PULLING OPEN A DOOR OR GATE OTHER THAN FIRE DOORS SHALL BE AS FOLLOWS:

INTERIOR HINGED DOORS AND GATES: 5 POUNDS MAXIMUM.
SLIDING OR FOLDING DOORS: 5 POUNDS MAXIMUM.
EXTERIOR OR FIRE DOORS: 8.5 POUNDS MAXIMUM.

THESE FORCES DO NOT APPLY TO THE FORCE REQUIRED TO RETRACT LATCH BOLTS OR DISENGAGE OTHER DEVICES THAT HOLD THE DOOR OR GATE IN A CLOSED POSITION.

404.2.10 DOOR AND GATE SURFACES. SWINGING DOOR AND GATE SURFACES WITHIN 10" OF THE FINISH FLOOR OR GROUND MEASURED VERTICALLY SHALL HAVE A SMOOTH SURFACE ON THE PUSH SIDE EXTENDING THE FULL WIDTH OF THE DOOR OR GATE. PARTS CREATING HORIZONTAL OR VERTICAL JOINTS IN THESE SURFACES SHALL BE WITHIN 1/16" OF THE SAME PLANE AS THE OTHER. CAVITIES CREATED BY ADDED KICK PLATES SHALL BE CAPPED. EXCEPTIONS: (1.) SLIDING DOORS SHALL NOT BE REQUIRED TO COMPLY WITH 404.2.10. (2.) TEMPERED GLASS DOORS WITHOUT STILES AND HAVING A BOTTOM RAIL OR SHOE WITH THE TOP LEADING EDGE TAPERED AT 60 DEGREES MINIMUM FROM THE HORIZONTAL SHALL NOT BE REQUIRED TO MEET THE 10" BOTTOM SMOOTH SURFACE HEIGHT REQUIREMENT. (3.) DOORS AND GATES THAT DO NOT EXTEND TO WITHIN 10" OF THE FINISH FLOOR OR GROUND SHALL NOT BE REQUIRED TO COMPLY WITH 404.2.10. (4.) EXISTING DOORS AND GATES WITHOUT SMOOTH SURFACES WITHIN 10" OF THE FINISH FLOOR OR GROUND SHALL NOT BE REQUIRED TO PROVIDE SMOOTH SURFACES COMPLYING WITH 404.2.10 PROVIDED THAT IF ADDED KICK PLATES ARE INSTALLED, CAVITIES CREATED BY SUCH KICK PLATES ARE CAPPED.

404.2.11 VISION LIGHTS. DOORS, GATES, AND SIDE LIGHTS ADJACENT TO DOORS OR GATES, CONTAINING ONE OR MORE GLAZING PANELS THAT PERMIT VIEWING THROUGH THE PANELS SHALL HAVE THE BOTTOM OF AT LEAST ONE GLAZED PANEL LOCATED 43" MAXIMUM ABOVE THE FINISH FLOOR. EXCEPTION: VISION LIGHTS WITH THE LOWEST PART MORE THAN 66" FROM THE FINISH FLOOR OR GROUND SHALL NOT BE REQUIRED TO COMPLY WITH 404.2.11.



405 GENERAL

RAMPS ON ACCESSIBLE ROUTES SHALL COMPLY WITH 405. EXCEPTION: IN ASSEMBLY AREAS, AISLE RAMPS ADJACENT TO SEATING AND NOT SERVING PASSENGERS ARE REQUIRED TO BE ON AN ACCESSIBLE ROUTE SHALL NOT BE REQUIRED TO COMPLY WITH 405.

405.2 SLOPE

RAMP RUNS SHALL HAVE A RUNNING SLOPE NOT STEEPER THAN 1:12. EXCEPTION: IN EXISTING SITES, BUILDINGS, AND FACILITIES, RAMPS SHALL BE PERMITTED TO HAVE RUNNING SLOPES STEEPER THAN 1:12 COMPLYING WITH TABLE 405.2 WHERE SUCH SLOPES ARE NECESSARY DUE TO SPACE LIMITATIONS.

TABLE 405.2 MAXIMUM RAMP SLOPE AND RISE FOR EXISTING SITES, BUILDINGS, AND FACILITIES

SLOPE (1)	MAXIMUM RISE
STEEPER THAN 1:10 BUT NOT STEEPER THAN 1:8	3 INCHES
STEEPER THAN 1:12 BUT NOT STEEPER THAN 1:10	6 INCHES

1. A SLOPE STEEPER THAN 1:8 IS PROHIBITED.

405.3 CROSS SLOPE. CROSS SLOPE OF RAMP RUNS SHALL NOT BE STEEPER THAN 1:48

405.4 FLOOR OR GROUND SURFACES. FLOOR OR GROUND SURFACES OF RAMP RUNS SHALL COMPLY WITH 302. CHANGES IN LEVEL OTHER THAN THE RUNNING SLOPE AND CROSS SLOPE ARE NOT PERMITTED ON RAMP RUNS.

405.5 CLEAR WIDTH. THE CLEAR WIDTH OF A RAMP RUN AND, WHERE HANDRAILS ARE PROVIDED, THE CLEAR WIDTH BETWEEN HANDRAILS SHALL BE 36" MINIMUM. EXCEPTION: WITHIN EMPLOYEE WORK AREAS, THE REQUIRED CLEAR WIDTH OF RAMPS THAT ARE A PART OF COMMON USE CIRCULATION PATHS SHALL BE PERMITTED TO BE DECREASED BY WORK AREA EQUIPMENT PROVIDED THAT THE DECREASE IS ESSENTIAL TO THE FUNCTION OF THE WORK BEING PERFORMED.

405.6 RISE. THE RISE FOR ANY RAMP RUN SHALL BE 30" MAXIMUM.

405.7 LANDINGS. RAMPS SHALL HAVE LANDINGS AT THE TOP AND THE BOTTOM OF EACH RAMP RUN. LANDINGS SHALL COMPLY WITH 405.7. 405.7.1 SLOPE. LANDINGS SHALL HAVE HAVE A MAXIMUM SLOPE OF 1:48 IN ALL DIRECTIONS. 405.7.2 SLOPE. LANDINGS SHALL COMPLY WITH 302. CHANGES IN LEVEL ARE NOT PERMITTED. EXCEPTION: SLOPES NOT STEEPER THAN 1:48 SHALL BE PERMITTED. 405.7.3 LENGTH. THE LANDING CLEAR LENGTH SHALL BE 60" LONG MINIMUM. 405.7.4 CHANGE IN DIRECTION. RAMPS THAT CHANGE DIRECTION BETWEEN RUNS AT LANDINGS SHALL HAVE A CLEAR LANDING 60" MINIMUM BY 60" MINIMUM. 405.7.5 DOORWAYS. WHERE DOORWAYS ARE LOCATED ADJACENT TO A RAMP LANDING, MANEUVERING CLEARANCES REQUIRED BY 404.2.4 AND 404.3.2 SHALL BE PERMITTED TO OVERLAP THE REQUIRED LANDING AREA.

405.8 HANDRAILS. RAMP RUNS WITH A RISE GREATER THAN 6" SHALL HAVE HANDRAILS COMPLYING WITH 505. EXCEPTION: WITHIN EMPLOYEE WORK AREAS, HANDRAILS SHALL NOT BE REQUIRED WHERE RAMPS THAT ARE PART OF COMMON USE CIRCULATION PATHS ARE DESIGNED TO PERMIT THE INSTALLATION OF HANDRAILS COMPLYING WITH 505. RAMPS NOT SUBJECT TO THE EXCEPTION TO 405.5 SHALL BE DESIGNED TO MAINTAIN A 36" MINIMUM CLEAR WIDTH WHEN HANDRAILS ARE INSTALLED.

405.9 EDGE PROTECTION. EDGE PROTECTION COMPLYING WITH 405.9.1 OR 405.9.2 SHALL BE PROVIDED ON EACH SIDE OF RAMP RUNS AND AT EACH SIDE OF RAMP LANDINGS. EXCEPTIONS: (1) EDGE PROTECTION SHALL NOT BE REQUIRED ON RAMPS THAT ARE NOT REQUIRED TO HAVE HANDRAILS AND HAVE SIDES COMPLYING WITH 406.3. (2) EDGE PROTECTION SHALL NOT BE REQUIRED ON THE SIDES OF RAMP LANDINGS SERVING AN ADJOINING RAMP RUN OR STAIRWAY. (3) EDGE PROTECTION SHALL NOT BE REQUIRED ON THE SIDES OF RAMP LANDINGS HAVING A VERTICAL DROP-OFF OF 1/2" MAXIMUM WITHIN 10" HORIZONTALLY OF THE MINIMUM LANDING AREA SPECIFIED IN 405.7.

405.9.1 EXTENDED FLOOR OR GROUND SURFACE. THE FLOOR OR GROUND SURFACE OF THE RAMP RUN OR LANDING SHALL EXTEND 12" MINIMUM BEYOND THE INSIDE FACE OF A HANDRAIL COMPLYING WITH 505.

405.9.2 CURB OR BARRIER. A CURB OR BARRIER SHALL BE PROVIDED THAT PREVENTS THE PASSAGE OF A 4" DIAMETER SPHERE, WHERE ANY PORTION OF THE SPHERE IS WITHIN 4" OF THE FINISH FLOOR OR GROUND SURFACE.

405.10 WET CONDITIONS. LANDINGS SUBJECT TO WET CONDITIONS SHALL BE DESIGNED TO PREVENT THE ACCUMULATION OF WATER.

406 CURB RAMPS 406.1 GENERAL. CURB RAMPS ON ACCESSIBLE ROUTES SHALL COMPLY WITH 406, 405.2 THROUGH 405.5, AND 405.10.

406.2 COUNTER SLOPE. COUNTER SLOPES OF ADJOINING GUTTERS AND ROAD SURFACES IMMEDIATELY ADJACENT TO THE CURB RAMP SHALL NOT BE STEEPER THAN 1:20. THE ADJACENT SURFACES AT TRANSITIONS AT CURB RAMPS TO WALKS, GUTTERS, AND STREETS SHALL BE AT THE SAME LEVEL.

406.3 SIDES OF CURB RAMPS. WHERE PROVIDED, CURB RAMP FLARES SHALL NOT BE STEEPER THAN 1:10.

406.5 LOCATION. CURB RAMPS AND THE FLARED SIDES OF CURB RAMPS SHALL BE LOCATED SO THAT THEY DO NOT PROJECT INTO VEHICULAR TRAFFIC LANES, PARKING SPACES, OR PARKING ACCESS AISLES. CURB RAMPS AT MARKED CROSSINGS SHALL BE WHOLLY CONTAINED WITHIN THE MARKINGS, EXCLUDING ANY FLARED SIDES.

406.6 DIAGONAL CURB RAMPS. DIAGONAL OR CORNER TYPE CURB RAMPS WITH RETURNED CURBS OR OTHER WELL-DEFINED EDGES SHALL HAVE THE EDGES PARALLEL TO THE DIRECTION OF PEDESTRIAN FLOW. THE BOTTOM OF DIAGONAL CURB RAMPS SHALL HAVE A CLEAR SPACE 48" MINIMUM OUTSIDE ACTIVE TRAFFIC LANES OF THE ROADWAY. DIAGONAL CURB RAMPS PROVIDED AT MARKED CROSSINGS SHALL PROVIDE THE 48" MINIMUM CLEAR SPACE WITHIN THE MARKINGS. DIAGONAL CURB RAMPS WITH FLARED SIDES SHALL HAVE A SEGMENT OF CURB 24" LONG MINIMUM LOCATED ON EACH SIDE OF THE CURB RAMP AND WITHIN THE MARKED CROSSING.

406.5 LOCATION. CURB RAMPS AND THE FLARED SIDES OF CURB RAMPS SHALL BE LOCATED SO THAT THEY DO NOT PROJECT INTO VEHICULAR TRAFFIC LANES, PARKING SPACES, OR PARKING ACCESS AISLES. CURB RAMPS AT MARKED CROSSINGS SHALL BE WHOLLY CONTAINED WITHIN THE MARKINGS, EXCLUDING ANY FLARED SIDES.

406.6 DIAGONAL CURB RAMPS. DIAGONAL OR CORNER TYPE CURB RAMPS WITH RETURNED CURBS OR OTHER WELL-DEFINED EDGES SHALL HAVE THE EDGES PARALLEL TO THE DIRECTION OF PEDESTRIAN FLOW. THE BOTTOM OF DIAGONAL CURB RAMPS SHALL HAVE A CLEAR SPACE 48" MINIMUM OUTSIDE ACTIVE TRAFFIC LANES OF THE ROADWAY. DIAGONAL CURB RAMPS PROVIDED AT MARKED CROSSINGS SHALL PROVIDE THE 48" MINIMUM CLEAR SPACE WITHIN THE MARKINGS. DIAGONAL CURB RAMPS WITH FLARED SIDES SHALL HAVE A SEGMENT OF CURB 24" LONG MINIMUM LOCATED ON EACH SIDE OF THE CURB RAMP AND WITHIN THE MARKED CROSSING.

406.7 ISLANDS. RAISED ISLANDS IN CROSSINGS SHALL BE CUT THROUGH LEVEL WITH THE STREET OR HAVE CURB RAMPS AT BOTH SIDES. EACH CURB RAMP SHALL HAVE A LEVEL AREA 48" LONG MINIMUM BY 36" WIDE MINIMUM AT THE TOP OF THE CURB RAMP IN THE PART OF THE ISLAND INTERSECTED BY THE CROSSINGS. EACH 48" MINIMUM BY 36" MINIMUM AREA SHALL BE ORIENTED SO THAT THE 48" MINIMUM LENGTH IS IN THE DIRECTION OF THE RUNNING SLOPE OF THE CURB RAMP IT SERVES. THE 48" MINIMUM BY 36" MINIMUM AREAS AND THE ACCESSIBLE ROUTE SHALL BE PERMITTED TO OVERLAP.

406.8 DETECTABLE WARNINGS. A CURB RAMP SHALL HAVE A DETECTABLE WARNING COMPLYING WITH 705. THE DETECTABLE WARNING SHALL EXTEND THE FULL WIDTH OF THE CURB RAMP [EXCLUSIVE OF FLARED SIDES] AND SHALL EXTEND EITHER THE FULL DEPTH OF THE CURB RAMP OR 24" DEEP MINIMUM MEASURED FROM THE BACK OF THE CURB ON THE RAMP SURFACE.

CHAPTER 5: GENERAL SITE AND BUILDING ELEMENTS

502 PARKING SPACES 502.1 GENERAL. CAR AND VAN PARKING SPACES SHALL COMPLY WITH 502. WHERE PARKING SPACES ARE MARKED WITH LINES, WIDTH MEASUREMENTS OF PARKING SPACES AND ACCESS AISLES SHALL BE MADE FROM THE CENTERLINE OF THE MARKINGS. EXCEPTION: WHERE PARKING SPACES OR ACCESS AISLES ARE NOT ADJACENT TO ANOTHER PARKING SPACE OR ACCESS AISLE, MEASUREMENTS SHALL BE PERMITTED TO INCLUDE THE FULL WIDTH OF THE LINE DEFINING THE PARKING SPACE OR ACCESS AISLE.

502.2 VEHICLE SPACES. CAR PARKING SPACES SHALL BE 96" WIDE MINIMUM AND VAN PARKING SPACES SHALL BE 132" WIDE MINIMUM. SHALL BE MARKED TO DEFINE THE WIDTH, AND SHALL HAVE AN ADJACENT ACCESS AISLE COMPLYING WITH 502.3. EXCEPTION: VAN PARKING SPACES SHALL BE PERMITTED TO BE 96" WIDE MINIMUM WHERE THE ACCESS AISLE IS 96 INCHES" WIDE MINIMUM.

502.3 ACCESS AISLE. ACCESS AISLES SERVING PARKING SPACES SHALL COMPLY WITH 502.3. ACCESS AISLES SHALL ADJOIN AN ACCESSIBLE ROUTE. TWO PARKING SPACES SHALL BE PERMITTED TO SHARE A COMMON ACCESS AISLE. 502.3.1 WIDTH. ACCESS AISLES SERVING CAR AND VAN PARKING SPACES SHALL BE 60 INCHES (1525 MM) WIDE MINIMUM. 502.3.2 LENGTH. ACCESS AISLES SHALL EXTEND THE FULL LENGTH OF THE PARKING SPACES THEY SERVE. 502.3.3 MARKING. ACCESS AISLES SHALL BE MARKED SO AS TO DISCOURAGE PARKING IN THEM.

502.4 FLOOR OR GROUND SURFACES. PARKING SPACES AND ACCESS AISLES SERVING THEM SHALL COMPLY WITH 302. ACCESS AISLES SHALL BE AT THE SAME LEVEL AS THE PARKING SPACES THEY SERVE. CHANGES IN LEVEL ARE NOT PERMITTED. EXCEPTION: SLOPES NOT STEEPER THAN 1:48 SHALL BE PERMITTED.

502.5 VERTICAL CLEARANCE. PARKING SPACES FOR VANS AND ACCESS AISLES AND VEHICULAR ROUTES SERVING THEM SHALL PROVIDE A VERTICAL CLEARANCE OF 98" MINIMUM.

502.6 IDENTIFICATION. PARKING SPACE IDENTIFICATION SIGNS SHALL INCLUDE THE INTERNATIONAL SYMBOL OF ACCESSIBILITY COMPLYING WITH 703.7.2.1. SIGNS IDENTIFYING VAN PARKING SPACES SHALL CONTAIN THE DESIGNATION "VAN ACCESSIBLE." SIGNS SHALL BE 60" MINIMUM ABOVE THE FINISH FLOOR OR GROUND SURFACE MEASURED TO THE BOTTOM OF THE SIGN.

502.7 RELATIONSHIP TO ACCESSIBLE ROUTES. PARKING SPACES AND ACCESS AISLES SHALL BE DESIGNED SO THAT CARS AND VANS, WHEN PARKED, CANNOT OBSTRUCT THE REQUIRED CLEAR WIDTH OF ADJACENT ACCESSIBLE ROUTES.

503 PASSENGER LOADING ZONES 503.1 GENERAL. PASSENGER LOADING ZONES SHALL COMPLY WITH 503.

503.2 VEHICLE PULL-UP SPACE. PASSENGER LOADING ZONES SHALL PROVIDE A VEHICULAR PULL-UP SPACE 96" WIDE MINIMUM AND 20' LONG MINIMUM.

503.3 ACCESS AISLE. PASSENGER LOADING ZONES SHALL PROVIDE ACCESS AISLES COMPLYING WITH 503 ADJACENT TO THE VEHICLE PULL-UP SPACE. ACCESS AISLES SHALL ADJOIN AN ACCESSIBLE ROUTE AND SHALL NOT OVERLAP THE VEHICULAR WAY. 503.3.1 WIDTH. ACCESS AISLES SERVING VEHICLE PULL-UP SPACES SHALL BE 60" WIDE MINIMUM. 503.3.2 LENGTH. ACCESS AISLES SHALL EXTEND THE FULL LENGTH OF THE VEHICLE PULL-UP SPACES THEY SERVE. 503.3.3 MARKING. ACCESS AISLES SHALL BE MARKED SO AS TO DISCOURAGE PARKING IN THEM.

503.4 FLOOR AND GROUND SURFACES. VEHICLE PULL-UP SPACES AND ACCESS AISLES SERVING THEM SHALL COMPLY WITH 302. ACCESS AISLES SHALL BE AT THE SAME LEVEL AS THE VEHICLE PULL-UP SPACE THEY SERVE. CHANGES IN LEVEL ARE NOT PERMITTED. EXCEPTION: SLOPES NOT STEEPER THAN 1:48 SHALL BE PERMITTED.

503.5 VERTICAL CLEARANCE. VEHICLE PULL-UP SPACES, ACCESS AISLES SERVING THEM, AND A VEHICULAR ROUTE FROM AN ENTRANCE TO THE PASSENGER LOADING ZONE, AND FROM THE PASSENGER LOADING ZONE TO A VEHICULAR EXIT SHALL PROVIDE A VERTICAL CLEARANCE OF 114" MINIMUM.

504 STAIRS 504.1 GENERAL. STAIRS SHALL COMPLY WITH 504. 504.2 TREADS AND RISERS. ALL STEPS ON A FLIGHT OF STAIRS SHALL HAVE UNIFORM RISER HEIGHTS AND UNIFORM TREAD DEPTHS. RISERS SHALL BE 4" HIGH MINIMUM AND 7" HIGH MAXIMUM. TREADS SHALL BE 11" DEEP MINIMUM. 504.3 OPEN RISERS. OPEN RISERS ARE NOT PERMITTED. 504.4 TREAD SURFACE. STAIR TREADS SHALL COMPLY WITH 302. CHANGES IN LEVEL ARE NOT PERMITTED. EXCEPTION: TREADS SHALL BE PERMITTED TO HAVE A SLOPE NOT STEEPER THAN 1:48.

504.5 NOSINGS. THE RADIUS OF CURVATURE AT THE LEADING EDGE OF THE TREAD SHALL BE 3/4" MAXIMUM. NOSINGS THAT PROJECT BEYOND RISERS SHALL HAVE THE UNDERSIDE OF THE LEADING EDGE CURVED OR BEVELED. RISERS SHALL BE PERMITTED TO SLOPE UNDER THE TREAD AT AN ANGLE OF 30 DEGREES MAXIMUM FROM VERTICAL. THE PERMITTED PROJECTION OF THE NOSING SHALL EXTEND 1/2" MAXIMUM OVER THE TREAD BELOW. 504.6 HANDRAILS. STAIRS SHALL HAVE HANDRAILS COMPLYING WITH 505. 504.7 WET CONDITIONS. STAIR TREADS AND LANDINGS SUBJECT TO WET CONDITIONS SHALL BE DESIGNED TO PREVENT THE ACCUMULATION OF WATER.

505 HANDRAILS 505.1 GENERAL. HANDRAILS PROVIDED ALONG WALKING SURFACES COMPLYING WITH 403, REQUIRED AT RAMPS COMPLYING WITH 405, AND REQUIRED AT STAIRS COMPLYING WITH 504 SHALL COMPLY WITH 505.

505.2 WHERE REQUIRED. HANDRAILS SHALL BE PROVIDED ON BOTH SIDES OF STAIRS AND RAMPS. EXCEPTION: IN ASSEMBLY AREAS, HANDRAILS SHALL NOT BE REQUIRED ON BOTH SIDES OF AISLE RAMPS WHERE A HANDRAIL IS PROVIDED AT EITHER SIDE OR WITHIN THE AISLE WIDTH. 505.3 CONTINUITY. HANDRAILS SHALL BE CONTINUOUS WITHIN THE FULL LENGTH OF EACH STAIR FLIGHT OR RAMP RUN. INSIDE HANDRAILS ON SWITCHBACK OR DOGLEG STAIRS AND RAMPS SHALL BE CONTINUOUS BETWEEN FLIGHTS OR RUNS. EXCEPTION: IN ASSEMBLY AREAS, HANDRAILS ON RAMPS SHALL NOT BE REQUIRED TO BE CONTINUOUS IN AISLES SERVING SEATING. 505.4 HEIGHT. TOP OF GRIPPING SURFACES OF HANDRAILS SHALL BE 34" MINIMUM AND 38" MAXIMUM VERTICALLY ABOVE WALKING SURFACES, STAIR NOSINGS, AND RAMP SURFACES. HANDRAILS SHALL BE AT A CONSISTENT HEIGHT ABOVE WALKING SURFACES, STAIR NOSINGS, AND RAMP SURFACES.

505.5 CLEARANCE. CLEARANCE BETWEEN HANDRAIL GRIPPING SURFACES AND ADJACENT SURFACES SHALL BE 1 1/2" MINIMUM.

505.6 GRIPPING SURFACE. HANDRAIL GRIPPING SURFACES SHALL BE CONTINUOUS ALONG THEIR LENGTH AND SHALL NOT BE OBSTRUCTED ALONG THEIR TOPS OR SIDES. THE BOTTOMS OF HANDRAIL GRIPPING SURFACES SHALL NOT BE OBSTRUCTED FOR MORE THAN 20 PERCENT OF THEIR LENGTH. WHERE PROVIDED, HORIZONTAL PROJECTIONS SHALL OCCUR 1 1/2" MINIMUM BELOW THE BOTTOM OF THE HANDRAIL GRIPPING SURFACE. EXCEPTIONS: (1) WHERE HANDRAILS ARE PROVIDED ALONG WALKING SURFACES WITH SLOPES NOT STEEPER THAN 1:20, THE BOTTOMS OF HANDRAIL GRIPPING SURFACES SHALL BE PERMITTED TO BE OBSTRUCTED ALONG THEIR ENTIRE LENGTH WHERE THEY ARE INTEGRAL TO CRASH RAILS OR BUMPER GUARDS. (2) THE DISTANCE BETWEEN HORIZONTAL PROJECTIONS AND THE BOTTOM OF THE GRIPPING SURFACE SHALL BE PERMITTED TO BE REDUCED BY 1/8" FOR EACH 1/2" OF ADDITIONAL HANDRAIL PERIMETER DIMENSION THAT EXCEEDS 4". 505.7 CROSS SECTION. HANDRAIL GRIPPING SURFACES SHALL HAVE A CROSS SECTION COMPLYING WITH 505.7.1 OR 505.7.2. 505.7.1 CIRCULAR CROSS SECTION. HANDRAIL GRIPPING SURFACES WITH A CIRCULAR CROSS SECTION SHALL HAVE AN OUTSIDE DIAMETER OF 1 1/4" MINIMUM AND 2" MAXIMUM. 505.7.2 NON-CIRCULAR CROSS SECTIONS. HANDRAIL GRIPPING SURFACES WITH A NON-CIRCULAR CROSS SECTION SHALL HAVE A PERIMETER DIMENSION OF 4" MINIMUM AND 6 1/4" MAXIMUM, AND A CROSS-SECTION DIMENSION OF 2 1/4" MAXIMUM.

505.8 SURFACES. HANDRAIL GRIPPING SURFACES AND ANY SURFACES ADJACENT TO THEM SHALL BE FREE OF SHARP OR ABRASIVE ELEMENTS AND SHALL HAVE ROUNDED EDGES. 505.9 FITTINGS. HANDRAILS SHALL NOT ROTATE WITHIN THEIR FITTINGS.

505.10 HANDRAIL EXTENSIONS. HANDRAIL GRIPPING SURFACES SHALL EXTEND BEYOND AND IN THE SAME DIRECTION OF STAIR FLIGHTS AND RAMP RUNS IN ACCORDANCE WITH 505.10. EXCEPTIONS: (1) EXTENSIONS SHALL NOT BE REQUIRED FOR CONTINUOUS HANDRAILS AT THE INSIDE TURN OF SWITCHBACK OR DOGLEG STAIRS AND RAMPS. (2) IN ASSEMBLY AREAS, EXTENSIONS SHALL NOT BE REQUIRED FOR RAMP HANDRAILS IN AISLES SERVING SEATING WHERE THE HANDRAILS ARE DISCONTINUOUS TO PROVIDE ACCESS TO SEATING AND TO PERMIT CROSSOVERS WITHIN AISLES. (3) IN ALTERATIONS, FULL EXTENSIONS OF HANDRAILS SHALL NOT BE REQUIRED WHERE SUCH EXTENSIONS WOULD BE HAZARDOUS DUE TO PLAN CONFIGURATION.

505.10.1 TOP AND BOTTOM EXTENSION AT RAMPS. RAMP HANDRAILS SHALL EXTEND HORIZONTALLY ABOVE THE LANDING FOR 12" MINIMUM BEYOND THE TOP AND BOTTOM OF RAMP RUNS. EXTENSIONS SHALL RETURN TO A WALL, GUARD, OR THE LANDING SURFACE, OR SHALL BE CONTINUOUS TO THE HANDRAIL OF AN ADJACENT RAMP RUN. 505.10.2 TOP EXTENSION AT STAIRS. AT THE TOP OF A STAIR FLIGHT, HANDRAILS SHALL EXTEND HORIZONTALLY ABOVE THE LANDING FOR 12" MINIMUM BEGINNING DIRECTLY ABOVE THE FIRST RISER NOSING. EXTENSIONS SHALL RETURN TO A WALL, GUARD, OR THE LANDING SURFACE, OR SHALL BE CONTINUOUS TO THE HANDRAIL OF AN ADJACENT STAIR FLIGHT.

505.10.3 BOTTOM EXTENSION AT STAIRS. AT THE BOTTOM OF A STAIR FLIGHT, HANDRAILS SHALL EXTEND AT THE SLOPE OF THE STAIR FLIGHT FOR A HORIZONTAL DISTANCE AT LEAST EQUAL TO ONE TREAD DEPTH BEYOND THE LAST RISER NOSING. EXTENSION SHALL RETURN TO A WALL, GUARD, OR THE LANDING SURFACE, OR SHALL BE CONTINUOUS TO THE HANDRAIL OF AN ADJACENT STAIR FLIGHT.

CHAPTER 6: PLUMBING ELEMENTS AND FACILITIES

602 DRINKING FOUNTAINS 602.1 GENERAL. DRINKING FOUNTAINS SHALL COMPLY WITH 307 AND 602.

602.2 CLEAR FLOOR SPACE. UNITS SHALL HAVE A CLEAR FLOOR OR GROUND SPACE COMPLYING WITH 305 POSITIONED FOR A FORWARD APPROACH AND CENTERED ON THE UNIT. KNEE AND TOE CLEARANCE COMPLYING WITH 306 SHALL BE PROVIDED. EXCEPTION: A PARALLEL APPROACH WITH 305 SHALL BE PERMITTED AT UNITS FOR CHILDREN'S USE WHERE THE SPOUT IS 30" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND AND IS 3 1/2" MAXIMUM FROM THE FRONT EDGE OF THE UNIT, INCLUDING BUMPERS. 602.3 OPERABLE PARTS. OPERABLE PARTS SHALL COMPLY WITH 309.

602.4 SPOUT HEIGHT. SPOUT OUTLETS SHALL BE 36" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND.

602.5 SPOUT LOCATION. THE SPOUT SHALL BE LOCATED 15" MINIMUM FROM THE VERTICAL SUPPORT AND 5" MAXIMUM FROM THE FRONT EDGE OF THE UNIT, INCLUDING BUMPERS.

602.6 WATER FLOW. THE SPOUT SHALL PROVIDE A FLOW OF WATER 4" HIGH MINIMUM AND SHALL BE LOCATED 5" MAXIMUM FROM THE FRONT OF THE UNIT. THE ANGLE OF THE WATER STREAM SHALL BE MEASURED HORIZONTALLY RELATIVE TO THE FRONT FACE OF THE UNIT. WHERE SPOUTS ARE LOCATED LESS THAN 3" OF THE FRONT OF THE UNIT, THE ANGLE OF THE WATER STREAM SHALL BE 30 DEGREES MAXIMUM. WHERE SPOUTS ARE LOCATED BETWEEN 3" AND 5" MAXIMUM FROM THE FRONT OF THE UNIT, THE ANGLE OF THE WATER STREAM SHALL BE 15 DEGREES MAXIMUM. 602.7 DRINKING FOUNTAINS FOR STANDING PERSONS. SPOUT OUTLETS OF DRINKING FOUNTAINS FOR STANDING PERSONS SHALL BE 38" MINIMUM AND 43" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND.

603 TOILET AND BATHING ROOMS 603.1 GENERAL. TOILET AND BATHING ROOMS SHALL COMPLY WITH 603.

603.2 CLEARANCES. CLEARANCES SHALL COMPLY WITH 603.2. 603.2.1 TURNING SPACE. TURNING SPACE COMPLYING WITH 304 SHALL BE PROVIDED WITHIN THE ROOM.

603.2.2 OVERLAP. REQUIRED CLEAR FLOOR SPACES, CLEARANCE AT FIXTURES, AND TURNING SPACE SHALL BE PERMITTED TO OVERLAP.

603.2.3 DOOR SWING. DOORS SHALL NOT SWING INTO THE CLEAR FLOOR SPACE OR CLEARANCE REQUIRED FOR ANY FIXTURE. DOORS SHALL BE PERMITTED TO SWING INTO THE REQUIRED TURNING SPACE. EXCEPTIONS: (1) DOORS TO A TOILET ROOM OR BATHING ROOM FOR A SINGLE OCCUPANT ACCESSED ONLY THROUGH A PRIVATE OFFICE AND NOT FOR COMMON USE OR PUBLIC USE SHALL BE PERMITTED TO SWING INTO THE CLEAR FLOOR SPACE OR CLEARANCE PROVIDED THE SWING OF THE DOOR CAN BE REVERSED TO COMPLY WITH 603.2.3. (2) WHERE THE TOILET ROOM OR BATHING ROOM IS FOR INDIVIDUAL USE AND A CLEAR FLOOR SPACE COMPLYING WITH 305.3 IS PROVIDED WITHIN THE ROOM BEYOND THE ARC OF THE DOOR SWING, DOORS SHALL BE PERMITTED TO SWING INTO THE CLEAR FLOOR SPACE OR CLEARANCE REQUIRED FOR ANY FIXTURE.

603.3 MIRRORS. MIRRORS LOCATED ABOVE LAVATORIES OR COUNTERTOPS SHALL BE INSTALLED WITH THE BOTTOM EDGE OF THE REFLECTING SURFACE 40" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. MIRRORS NOT LOCATED ABOVE LAVATORIES OR COUNTERTOPS SHALL BE INSTALLED WITH THE BOTTOM EDGE OF THE REFLECTING SURFACE 35" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. 603.4 COAT HOOKS AND SHELVES. COAT HOOKS SHALL BE LOCATED WITHIN ONE OF THE REACH RANGES SPECIFIED IN 308. SHELVES SHALL BE LOCATED 40" MINIMUM AND 48" MAXIMUM ABOVE THE FINISH FLOOR.

DESIGNED	DRAWN	REVIEWED	APPROVED	REV.	DATE	BY	REMARKS
WILETT HOFMANN & ASSOCIATES, INC.	WILETT HOFMANN & ASSOCIATES, INC.	WILETT HOFMANN & ASSOCIATES, INC.	WILETT HOFMANN & ASSOCIATES, INC.				
ENGINEERING ARCHITECTURE LAND SURVEYING	ENGINEERING ARCHITECTURE LAND SURVEYING	ENGINEERING ARCHITECTURE LAND SURVEYING	ENGINEERING ARCHITECTURE LAND SURVEYING				
605 32ND AVE SW CEDAR RAPIDS, IA 52404	605 32ND AVE SW CEDAR RAPIDS, IA 52404	605 32ND AVE SW CEDAR RAPIDS, IA 52404	605 32ND AVE SW CEDAR RAPIDS, IA 52404				
1-319-378-1401	1-319-378-1401	1-319-378-1401	1-319-378-1401				
WILETT HOFMANN & ASSOCIATES, INC.	WILETT HOFMANN & ASSOCIATES, INC.	WILETT HOFMANN & ASSOCIATES, INC.	WILETT HOFMANN & ASSOCIATES, INC.				
© Copyright	© Copyright	© Copyright	© Copyright				
WHA No. 1854D23	WHA No. 1854D23	WHA No. 1854D23	WHA No. 1854D23				
DATE 10/21/2024	DATE 10/21/2024	DATE 10/21/2024	DATE 10/21/2024				
SHEET No. G1.02	SHEET No. G1.02	SHEET No. G1.02	SHEET No. G1.02				

PHASE
☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST
☐

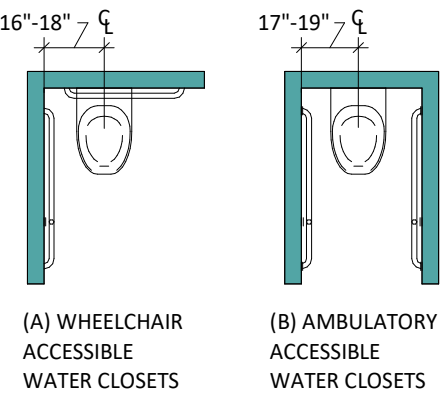
WHA No. 1854D23
DATE 10/21/2024
SHEET No. G1.02

This document is the copyrighted property of Willett, Hoffmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright

604 WATER CLOSETS AND TOILET COMPARTMENTS

604.1 GENERAL. WATER CLOSETS AND TOILET COMPARTMENTS SHALL COMPLY WITH 604.2 THROUGH 604.8. EXCEPTION: WATER CLOSETS AND TOILET COMPARTMENTS FOR CHILDREN'S USE SHALL BE PERMITTED TO COMPLY WITH 604.9.

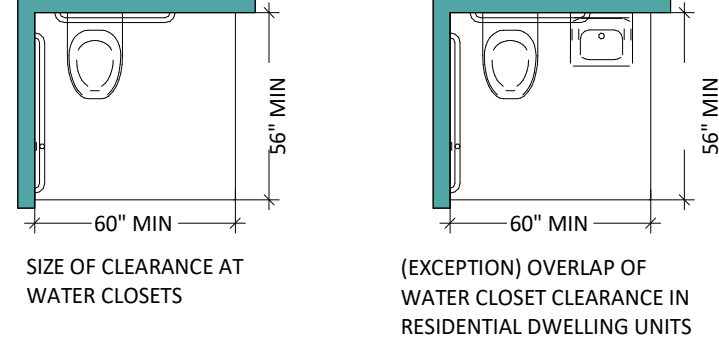
604.2 LOCATION. THE WATER CLOSET SHALL BE POSITIONED WITH A WALL OR PARTITION TO THE REAR AND TO ONE SIDE. THE CENTERLINE OF THE WATER CLOSET SHALL BE 16" MINIMUM TO 18" MAXIMUM FROM THE SIDE WALL OR PARTITION, EXCEPT THAT THE WATER CLOSET SHALL BE 17" MINIMUM AND 19" MAXIMUM FROM THE SIDE WALL OR PARTITION IN THE AMBULATORY ACCESSIBLE TOILET COMPARTMENT SPECIFIED IN 604.8.2. WATER CLOSETS SHALL BE ARRANGED FOR A LEFT-HAND OR RIGHT-HAND APPROACH.



604.3 CLEARANCE. CLEARANCES AROUND WATER CLOSETS AND IN TOILET COMPARTMENTS SHALL COMPLY WITH 604.3.

604.3.1 SIZE. CLEARANCE AROUND A WATER CLOSET SHALL BE 60" MINIMUM MEASURED PERPENDICULAR FROM THE SIDE WALL AND 56" MINIMUM MEASURED PERPENDICULAR FROM THE REAR WALL.

604.3.2 OVERLAP. THE REQUIRED CLEARANCE AROUND THE WATER CLOSET SHALL BE PERMITTED TO OVERLAP THE WATER CLOSET, ASSOCIATED GRAB BARS, DISPENSERS, SANITARY NAPKIN DISPOSAL UNITS, COAT HOOKS, SHELVES, ACCESSIBLE ROUTES, CLEAR FLOOR SPACE AND CLEARANCES REQUIRED AT OTHER FIXTURES, AND THE TURNING SPACE. NO OTHER FIXTURES OR OBSTRUCTIONS SHALL BE LOCATED WITHIN THE REQUIRED WATER CLOSET CLEARANCE. EXCEPTION: IN RESIDENTIAL DWELLING UNITS, A LAVATORY COMPLYING WITH 606 SHALL BE PERMITTED ON THE REAR WALL 18" MINIMUM FROM THE WATER CLOSET CENTERLINE WHERE THE CLEARANCE AT THE WATER CLOSET IS 66" MINIMUM MEASURED PERPENDICULAR FROM THE REAR WALL.



604.4 SEATS. THE SEAT HEIGHT OF A WATER CLOSET ABOVE THE FINISH FLOOR SHALL BE 17" MINIMUM AND 19" MAXIMUM MEASURED TO THE TOP OF THE SEAT. SEATS SHALL NOT BE SPRUNG TO RETURN TO A LIFTED POSITION. EXCEPTIONS: (1) A WATER CLOSET IN A TOILET ROOM FOR A SINGLE OCCUPANT ACCESSED ONLY THROUGH A PRIVATE OFFICE AND NOT FOR COMMON USE OR PUBLIC USE PROVIDED THAT REINFORCEMENT HAS BEEN (2) IN RESIDENTIAL DWELLING UNITS, THE HEIGHT OF WATER CLOSETS SHALL BE PERMITTED TO BE 15" MINIMUM AND 19" MAXIMUM ABOVE THE FINISH FLOOR MEASURED TO THE TOP OF THE SEAT.

604.5 GRAB BARS. GRAB BARS FOR WATER CLOSETS SHALL COMPLY WITH 609. GRAB BARS SHALL BE PROVIDED ON THE SIDE WALL CLOSEST TO THE WATER CLOSET AND ON THE REAR WALL. EXCEPTIONS: (1) GRAB BARS SHALL NOT BE REQUIRED TO BE INSTALLED IN A TOILET ROOM FOR A SINGLE OCCUPANT ACCESSED ONLY THROUGH A PRIVATE OFFICE AND NOT FOR COMMON USE OR PUBLIC USE SHALL NOT BE REQUIRED TO COMPLY WITH 604.4. INSTALLED IN WALLS AND LOCATED SO AS TO PERMIT THE INSTALLATION OF GRAB BARS COMPLYING WITH 604.5. (2) IN RESIDENTIAL DWELLING UNITS, GRAB BARS SHALL NOT BE REQUIRED TO BE INSTALLED IN TOILET OR BATHROOMS PROVIDED THAT REINFORCEMENT HAS BEEN INSTALLED IN WALLS AND LOCATED SO AS TO PERMIT THE INSTALLATION OF GRAB BARS COMPLYING WITH 604.5. (3) IN DETENTION OR CORRECTION FACILITIES, GRAB BARS SHALL NOT BE REQUIRED TO BE INSTALLED IN HOUSING OR HOLDING CELLS THAT ARE SPECIALLY DESIGNED WITHOUT PROTRUSIONS FOR PURPOSES OF SUICIDE PREVENTION.

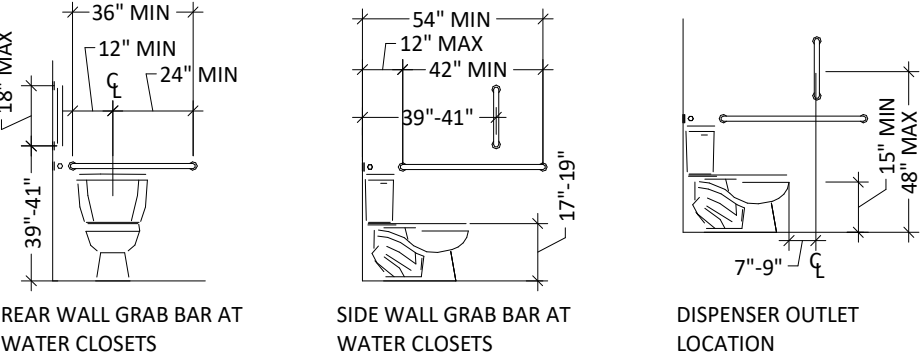
604.5.1 FIXED SIDE WALL GRAB BARS. THE SIDE WALL GRAB BAR SHALL BE 42" LONG MINIMUM, LOCATED 12" MAXIMUM FROM THE REAR WALL AND EXTENDING 54" MINIMUM FROM THE REAR WALL. GRAB BAR SHALL BE MOUNTED SUCH THAT THE TOP OF THE GRAB BAR IS 33" MINIMUM AND 36" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. IN ADDITION, A VERTICAL GRAB BAR 18" MINIMUM IN LENGTH SHALL BE MOUNTED WITH THE BOTTOM OF THE BAR LOCATED 39" MINIMUM AND 41" MAXIMUM ABOVE THE FLOOR, AND WITH THE CENTER LINE OF THE BAR LOCATED 39" MINIMUM AND 41" MAXIMUM FROM REAR WALL.

604.5.2 REAR WALL. THE REAR WALL GRAB BAR SHALL BE 36" LONG MINIMUM AND EXTEND FROM THE CENTERLINE OF THE WATER CLOSET 12" MINIMUM TO ONE SIDE AND 24" MINIMUM ON THE OTHER SIDE.

"ANSI REQUIREMENT: VERTICAL GRAB BAR SHALL BE 18" LONG MINIMUM AND SHALL BE MOUNTED SUCH THAT THE CENTER OF THE BOTTOM EXTENSION OF THE GRAB BAR IS 39" MINIMUM AND 41" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND.

604.6 FLUSH CONTROLS. FLUSH CONTROLS SHALL BE HAND OPERATED OR AUTOCRATIC. HAND OPERATED FLUSH CONTROLS SHALL COMPLY WITH 309. FLUSH CONTROLS SHALL BE LOCATED ON THE OPEN SIDE OF THE WATER CLOSET EXCEPT IN AMBULATORY ACCESSIBLE COMPARTMENTS COMPLYING WITH 604.8.2.

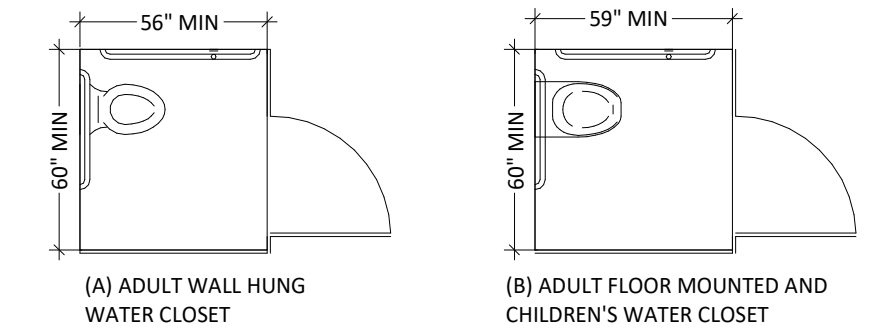
604.7 DISPENSERS. TOILET PAPER DISPENSERS SHALL COMPLY WITH 309.4 AND SHALL BE 7" MINIMUM AND 9" MAXIMUM IN FRONT OF THE FRONT EDGE OF THE WATER CLOSET MEASURED TO THE CENTERLINE OF THE DISPENSER. THE OUTLET OF THE DISPENSER SHALL BE 15" MINIMUM AND 48" MAXIMUM ABOVE THE FINISH FLOOR AND SHALL NOT BE LOCATED BEHIND GRAB BARS. DISPENSERS SHALL NOT BE OF A TYPE THAT CONTROLS DELIVERY OR DOES NOT ALLOW CONTINUOUS PAPER FLOW.



604.8 TOILET COMPARTMENTS. WHEELCHAIR ACCESSIBLE TOILET COMPARTMENTS SHALL MEET THE REQUIREMENTS OF 604.8.1 AND 604.8.3. COMPARTMENTS CONTAINING MORE THAN ONE PLUMBING FIXTURE SHALL COMPLY WITH 603.

604.8.1 WHEELCHAIR ACCESSIBLE COMPARTMENTS. WHEELCHAIR ACCESSIBLE COMPARTMENTS SHALL COMPLY WITH 604.8.1.

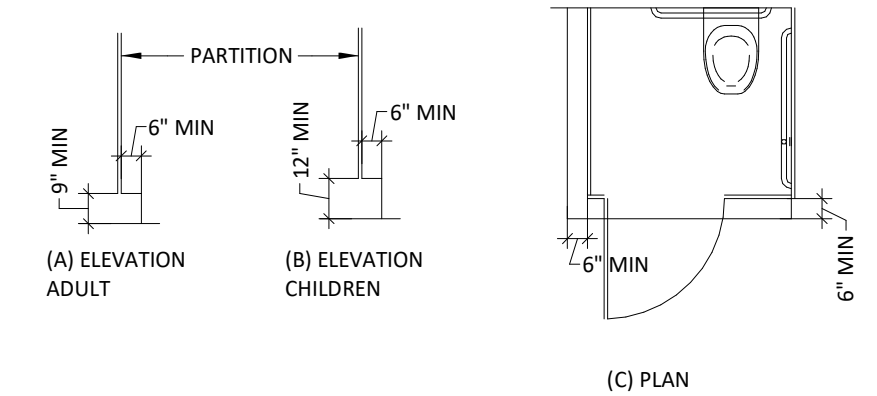
604.8.1.1 SIZE. WHEELCHAIR ACCESSIBLE COMPARTMENTS SHALL BE 60" WIDE MINIMUM MEASURED PERPENDICULAR TO THE SIDE WALL, AND 56" DEEP MINIMUM FOR WALL HUNG WATER CLOSETS AND 59" DEEP MINIMUM FOR FLOOR MOUNTED WATER CLOSETS MEASURED PERPENDICULAR TO THE REAR WALL. WHEELCHAIR ACCESSIBLE COMPARTMENTS FOR CHILDREN'S USE SHALL BE 60" WIDE MINIMUM MEASURED PERPENDICULAR TO THE SIDE WALL, AND 59" DEEP MINIMUM FOR WALL HUNG AND FLOOR MOUNTED WATER CLOSETS MEASURED PERPENDICULAR TO THE REAR WALL.



604.8.1.2 DOORS. TOILET COMPARTMENT DOORS, INCLUDING DOOR HARDWARE, SHALL COMPLY WITH 404 EXCEPT THAT IF THE APPROACH IS TO THE LATCH SIDE OF THE COMPARTMENT DOOR, CLEARANCE BETWEEN THE DOOR SIDE OF THE COMPARTMENT AND ANY OBSTRUCTION SHALL BE 42" MINIMUM. DOORS SHALL BE LOCATED IN THE FRONT PARTITION, THE DOOR OPENING SHALL BE 4" MAXIMUM FROM THE SIDE WALL OR PARTITION FARTHEST FROM THE WATER CLOSET. WHERE LOCATED IN THE SIDE WALL OR PARTITION, THE DOOR OPENING SHALL BE 4" MAXIMUM FROM THE FRONT PARTITION. THAT DOOR SHALL BE SELF-CLOSING. A DOOR PULL COMPLYING WITH 404.2.7 SHALL BE PLACED ON BOTH SIDES OF THE DOOR NEAR THE LATCH. TOILET COMPARTMENT DOORS SHALL NOT SWING INTO THE MINIMUM REQUIRED COMPARTMENT AREA.

604.8.1.3 APPROACH. COMPARTMENTS SHALL BE ARRANGED FOR LEFT HAND OR RIGHT-HAND APPROACH TO THE WATER CLOSET.

604.8.1.4 TOE CLEARANCE. THE FRONT PARTITION AND AT LEAST ONE SIDE PARTITION SHALL PROVIDE A TOE CLEARANCE OF 9" MINIMUM ABOVE THE FINISH FLOOR AND 6" DEEP MINIMUM BEYOND THE COMPARTMENT-SIDE FACE OF THE PARTITION, EXCLUSIVE OF PARTITION SUPPORT MEMBERS. COMPARTMENTS FOR CHILDREN'S USE SHALL PROVIDE A TOE CLEARANCE OF 12" MINIMUM ABOVE THE FINISH FLOOR.

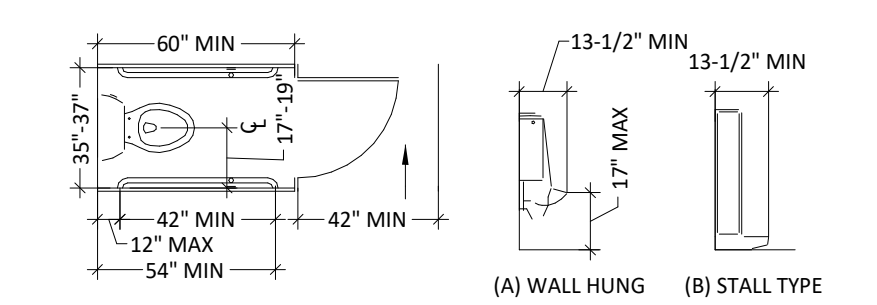


604.8.1.5 GRAB BARS. GRAB BARS SHALL COMPLY WITH 609. A SIDE-WALL GRAB BAR COMPLYING WITH 604.5.1 SHALL BE PROVIDED AND SHALL BE LOCATED ON THE WALL CLOSEST TO THE WATER CLOSET. IN ADDITION, A REAR-WALL GRAB BAR COMPLYING WITH 604.5.2 SHALL BE PROVIDED.

604.8.2 AMBULATORY ACCESSIBLE COMPARTMENTS. AMBULATORY ACCESSIBLE COMPARTMENTS SHALL COMPLY 604.8.2.

604.8.2.1 SIZE. AMBULATORY ACCESSIBLE COMPARTMENTS SHALL HAVE A DEPTH OF 60" MINIMUM AND A WIDTH OF 35" MINIMUM AND 37" MAXIMUM.

604.8.2.3 GRAB BARS. GRAB BARS SHALL COMPLY WITH 609. A SIDE-WALL GRAB BAR COMPLYING WITH 604.5.1 SHALL BE PROVIDED ON BOTH SIDES OF THE COMPARTMENT.



604.8.3 COAT HOOKS AND SHELVES. COAT HOOKS SHALL BE LOCATED WITH ONE OF THE REACH RANGES SPECIFIED IN 308. SHELVES SHALL BE LOCATED 40" MINIMUM AND 48" MAXIMUM ABOVE THE FINISH FLOOR.

605 URINALS

605.1 GENERAL. URINALS SHALL COMPLY WITH 605.

605.2 HEIGHT AND DEPTH. URINALS SHALL BE THE STALL-TYPE OR THE WALL-HUNG TYPE WITH THE RIM 17" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. URINALS SHALL BE 13-1/2" DEEP MINIMUM MEASURED FROM THE OUTER FACE OF THE URINAL RIM TO THE BACK OF THE URINAL FLURE.

605.3 CLEAR FLOOR SPACE. A CLEAR FLOOR OR GROUND SPACE COMPLYING WITH 305 POSITIONED FOR FORWARD APPROACH SHALL BE PROVIDED.

605.4 FLUSH CONTROLS. FLUSH CONTROLS SHALL BE HAND OPERATED OR AUTOMATIC. HAND OPERATED FLUSH CONTROLS SHALL COMPLY WITH 309.

606 LAVATORIES AND SINKS

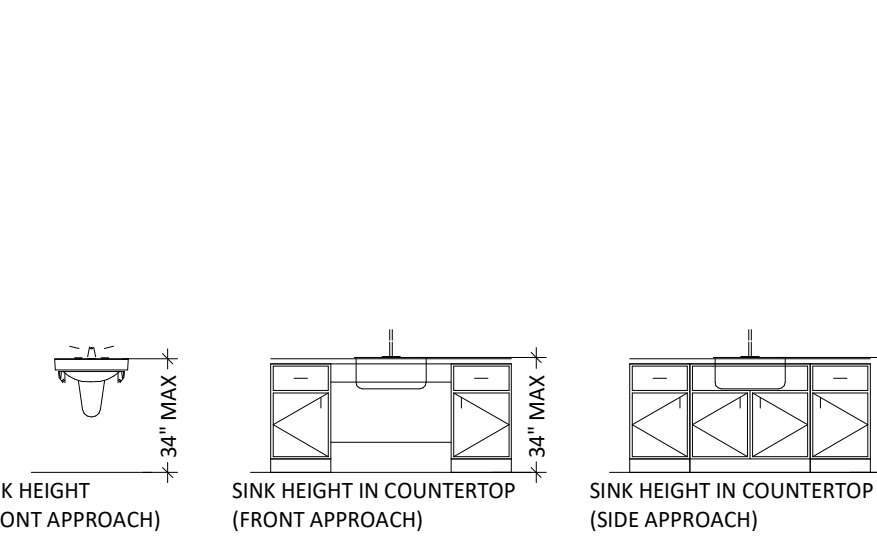
606.1 GENERAL. LAVATORIES AND SINKS SHALL COMPLY WITH 606.

606.2 CLEAR FLOOR SPACE. A CLEAR FLOOR SPACE COMPLYING WITH 305, POSITIONED FOR A FORWARD APPROACH, AND KNEE AND TOE CLEARANCE COMPLYING WITH 306 SHALL BE PROVIDED.

606.3 HEIGHT. LAVATORIES AND SINKS SHALL BE INSTALLED WITH THE FRONT OF THE HIGHER OF THE RIM OR COUNTER SURFACE 34" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND.

606.4 FAUCETS. CONTROLS FOR FAUCETS SHALL COMPLY WITH 309. HAND OPERATED METERING FAUCETS SHALL REMAIN OPEN FOR 10 SECONDS MINIMUM.

606.5 EXPOSED PIPES AND SURFACES. WATER SUPPLY AND DRAIN PIPES UNDER LAVATORIES AND SINKS SHALL BE INSULATED OR OTHERWISE CONFIGURED TO PROTECT AGAINST CONTACT. THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER LAVATORIES AND SINKS. PIPE INSULATION/PROTECTION SHALL STILL COMPLY WITH KNEE AND TOE CLEARANCES.



608 SHOWER COMPARTMENTS

608.1 GENERAL. SHOWER COMPARTMENTS SHALL COMPLY WITH 608.

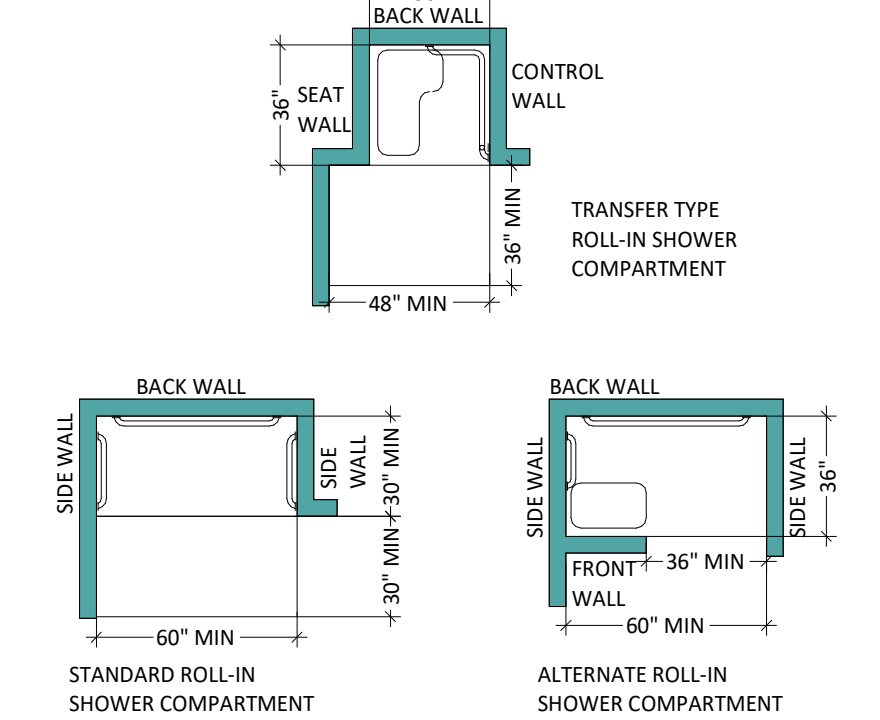
608.2 SIZE. SIZE AND CLEARANCES FOR SHOWER COMPARTMENTS. SHOWER COMPARTMENTS SHALL HAVE SIZES AND CLEARANCES COMPLYING WITH 608.2.

608.2.1 TRANSFER TYPE SHOWER COMPARTMENTS. TRANSFER TYPE SHOWER COMPARTMENTS SHALL BE 36" BY 36" CLEAR INSIDE DIMENSIONS MEASURED AT THE CENTER POINTS AND FINISH FACE OF OPPOSING SIDES AND SHALL HAVE 36" WIDE MINIMUM ENTRY ON THE FACE OF THE SHOWER COMPARTMENT. CLEARANCE OF 36" WIDE MINIMUM BY 48" LONG MINIMUM MEASURED FROM THE CONTROL WALL SHALL BE PROVIDED.

608.2.2 STANDARD ROLL-IN TYPE SHOWER COMPARTMENTS. STANDARD ROLL-IN TYPE SHOWER COMPARTMENTS SHALL BE 30" WIDE MINIMUM BY 60" DEEP MINIMUM CLEAR INSIDE DIMENSIONS MEASURED AT CENTER POINTS OF OPPOSING SIDES AND SHALL HAVE 60" WIDE MINIMUM ENTRY ON THE FACE OF THE SHOWER COMPARTMENT.

608.2.2.1 CLEARANCE. A 30" WIDE MINIMUM BY 60" LONG MINIMUM CLEARANCE SHALL BE PROVIDED ADJACENT TO THE OPEN FACE OF THE SHOWER COMPARTMENT.

608.2.3 ALTERNATE ROLL-IN TYPE SHOWER COMPARTMENTS. ALTERNATE ROLL-IN TYPE SHOWER COMPARTMENTS SHALL BE 36" WIDE AND 60" DEEP MINIMUM CLEAR INSIDE DIMENSIONS MEASURED AT THE CENTER POINTS OF OPPOSING SIDES. A 36" WIDE MINIMUM ENTRY SHALL BE PROVIDED AT ONE END OF THE LONG SIDE OF THE COMPARTMENT.



608.3 GRAB BARS. GRAB BARS SHALL COMPLY WITH 609 AND SHALL BE PROVIDED IN ACCORDANCE WITH 608.3. WHERE MULTIPLE GRAB BARS ARE USED, REQUIRED HORIZONTAL GRAB BARS SHALL BE INSTALLED AT THE SAME HEIGHT ABOVE THE FINISH FLOOR.

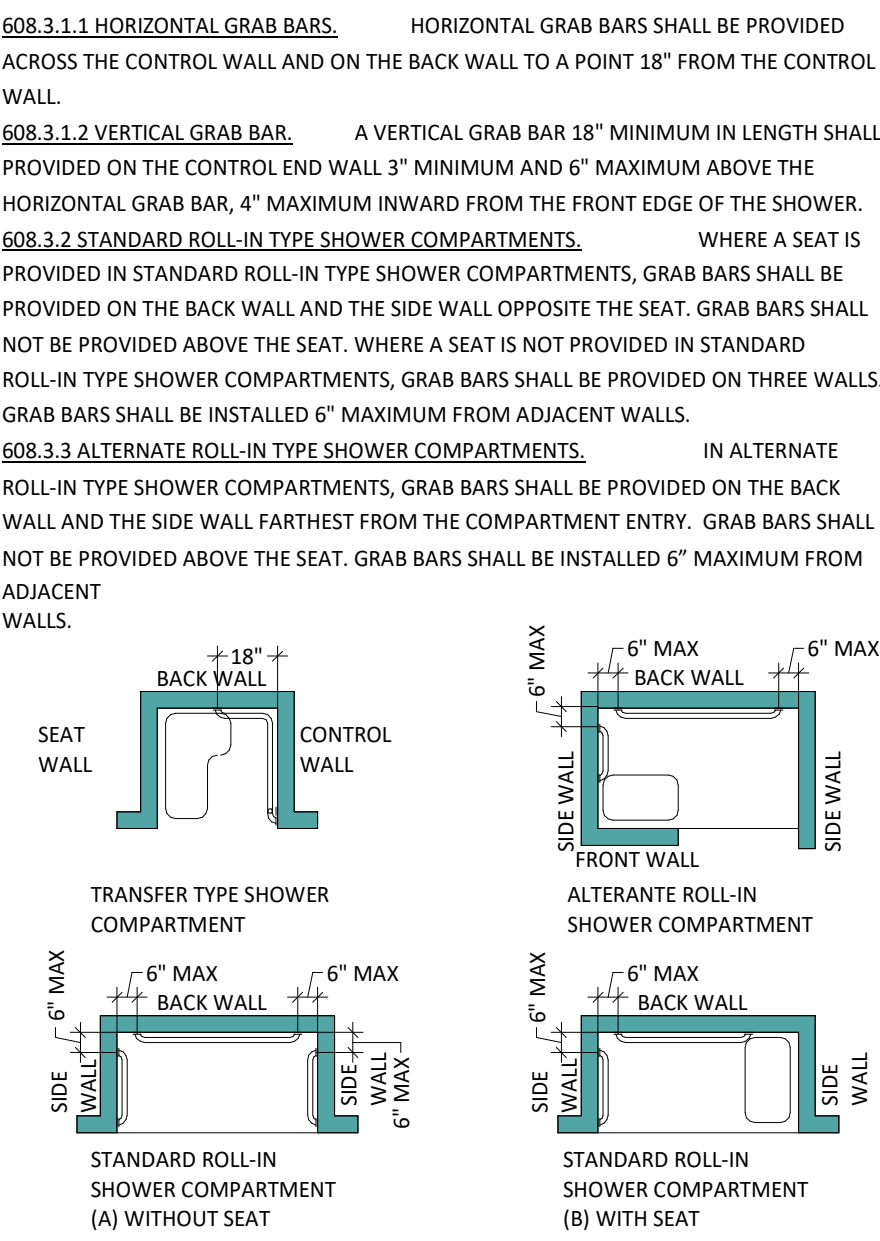
608.3.1 TRANSFER TYPE SHOWER COMPARTMENTS. IN TRANSFER TYPE SHOWER COMPARTMENTS, GRAB BARS SHALL BE PROVIDED ACROSS THE CONTROL WALL AND BACK WALL TO A POINT 18" FROM THE CONTROL WALL.

608.3.1.1 HORIZONTAL GRAB BARS. HORIZONTAL GRAB BARS SHALL BE PROVIDED ACROSS THE CONTROL WALL AND ON THE BACK WALL TO A POINT 18" FROM THE CONTROL WALL.

608.3.1.2 VERTICAL GRAB BAR. A VERTICAL GRAB BAR 18" MINIMUM IN LENGTH SHALL PROVIDED ON THE CONTROL END WALL 3" MINIMUM AND 6" MAXIMUM ABOVE THE HORIZONTAL GRAB BAR, 4" MAXIMUM INWARD FROM THE FRONT EDGE OF THE SHOWER.

608.3.2 STANDARD ROLL-IN TYPE SHOWER COMPARTMENTS. WHERE A SEAT IS PROVIDED IN STANDARD ROLL-IN TYPE SHOWER COMPARTMENTS, GRAB BARS SHALL BE PROVIDED ON THE BACK WALL AND THE SIDE WALL OPPOSITE THE SEAT. GRAB BARS SHALL NOT BE PROVIDED ABOVE THE SEAT. WHERE A SEAT IS NOT PROVIDED IN STANDARD ROLL-IN TYPE SHOWER COMPARTMENTS, GRAB BARS SHALL BE PROVIDED ON THREE WALLS. GRAB BARS SHALL BE INSTALLED 6" MAXIMUM FROM ADJACENT WALLS.

608.3.3 ALTERNATE ROLL-IN TYPE SHOWER COMPARTMENTS. IN ALTERNATE ROLL-IN TYPE SHOWER COMPARTMENTS, GRAB BARS SHALL BE PROVIDED ON THE BACK WALL AND THE SIDE WALL FARTHEST FROM THE COMPARTMENT ENTRY. GRAB BARS SHALL NOT BE PROVIDED ABOVE THE SEAT. GRAB BARS SHALL BE INSTALLED 6" MAXIMUM FROM ADJACENT WALLS.

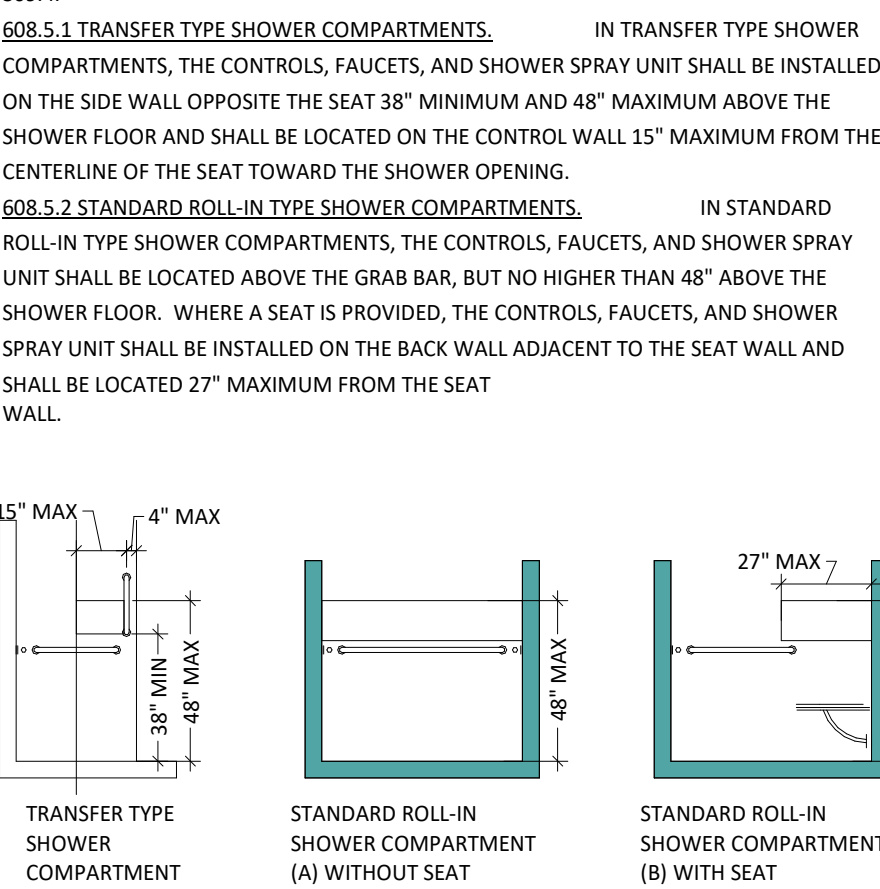


608.4 SEATS. A FOLDING OR NON-FOLDING SEAT SHALL BE PROVIDED IN TRANSFER TYPE SHOWER COMPARTMENTS. A FOLDING SEAT SHALL BE PROVIDED IN ROLL-IN TYPE SHOWERS REQUIRED IN TRANSIENT LODGING GUEST ROOMS WITH MOBILITY FEATURES COMPLYING WITH 806.2. SEATS SHALL COMPLY WITH 610.

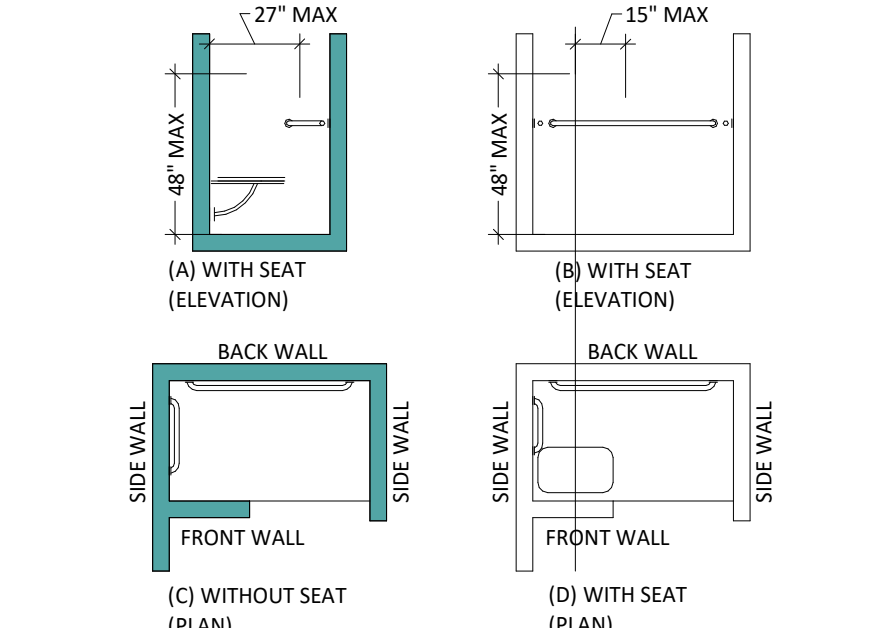
608.5 CONTROLS. CONTROLS, FAUCETS, AND SHOWER SPRAY UNITS SHALL COMPLY WITH 309.4.

608.5.1 TRANSFER TYPE SHOWER COMPARTMENTS. IN TRANSFER TYPE SHOWER COMPARTMENTS, THE CONTROLS, FAUCETS, AND SHOWER SPRAY UNIT SHALL BE INSTALLED ON THE SIDE WALL OPPOSITE THE SEAT 38" MINIMUM AND 48" MAXIMUM ABOVE THE SHOWER FLOOR AND SHALL BE LOCATED ON THE CONTROL WALL 15" MAXIMUM FROM THE CENTERLINE OF THE SEAT TOWARD THE SHOWER OPENING.

608.5.2 STANDARD ROLL-IN TYPE SHOWER COMPARTMENTS. IN STANDARD ROLL-IN TYPE SHOWER COMPARTMENTS, THE CONTROLS, FAUCETS, AND SHOWER SPRAY UNIT SHALL BE LOCATED ABOVE THE GRAB BAR, BUT NO HIGHER THAN 48" ABOVE THE SHOWER FLOOR. WHERE A SEAT IS PROVIDED, THE CONTROLS, FAUCETS, AND SHOWER SPRAY UNIT SHALL BE INSTALLED ON THE BACK WALL ADJACENT TO THE SEAT WALL AND SHALL BE LOCATED 27" MAXIMUM FROM THE SEAT WALL.



608.5.3 ALTERNATE ROLL-IN TYPE SHOWER COMPARTMENTS. IN ALTERNATE ROLL-IN TYPE SHOWER COMPARTMENTS, THE CONTROLS, FAUCETS, AND SHOWER SPRAY UNIT SHALL BE LOCATED ABOVE THE GRAB BAR, BUT NO HIGHER THAN 48" ABOVE THE SHOWER FLOOR. WHERE A SEAT IS PROVIDED, THE CONTROLS, FAUCETS, AND SHOWER SPRAY UNIT SHALL BE LOCATED ON THE SIDE WALL ADJACENT TO THE SEAT 27" MAXIMUM FROM THE SIDE WALL BEHIND THE SEAT OR SHALL BE LOCATED ON THE BACK WALL OPPOSITE THE SEAT 15" MAXIMUM, LEFT OR RIGHT, OF THE CENTERLINE OF THE SEAT. WHERE A SEAT IS NOT PROVIDED, THE CONTROLS, FAUCETS, AND SHOWER SPRAY UNIT SHALL BE INSTALLED ON THE SIDE WALL FARTHEST FROM THE COMPARTMENT ENTRY.



608.6 SHOWER SPRAY UNIT AND WATER. A SHOWER SPRAY UNIT WITH A HOSE 59" LONG MINIMUM THAT CAN BE USED BOTH AS A FIXED-POSITION SHOWER HEAD AND AS A HAND-HELD SHOWER SHALL BE PROVIDED. THE SHOWER SPRAY UNIT SHALL HAVE AN ON/OFF CONTROL WITH A NON-POSITIVE SHUT-OFF. IF AN ADJUSTABLE-HEIGHT SHOWER HEAD ON A VERTICAL BAR IS USED, THE BAR SHALL BE INSTALLED SO AS NOT TO OBSTRUCT THE USE OF GRAB BARS. SHOWER SPRAY UNITS SHALL DELIVER WATER THAT IS 120°F MAXIMUM.

608.7 THRESHOLDS. THRESHOLDS IN ROLL-IN TYPE SHOWER COMPARTMENTS SHALL BE 1/2" HIGH MAXIMUM IN ACCORDANCE WITH 303. IN TRANSFER TYPE SHOWER COMPARTMENTS, THRESHOLDS 1/2" HIGH MAXIMUM SHALL BE BEVELED, ROUNDED, OR VERTICAL.

608.8 SHOWER ENCLOSURES. ENCLOSURES FOR SHOWER COMPARTMENTS SHALL NOT OBSTRUCT CONTROLS, FAUCETS, AND SHOWER SPRAY UNITS OR OBSTRUCT TRANSFER FROM WHEELCHAIRS ONTO SHOWER SEATS.

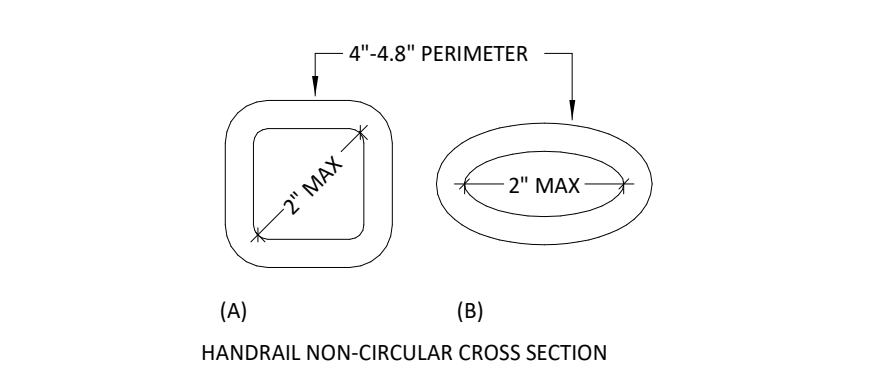
609 GRAB BARS

609.1 GENERAL. GRAB BARS IN TOILET FACILITIES AND BATHING FACILITIES SHALL COMPLY WITH 609.

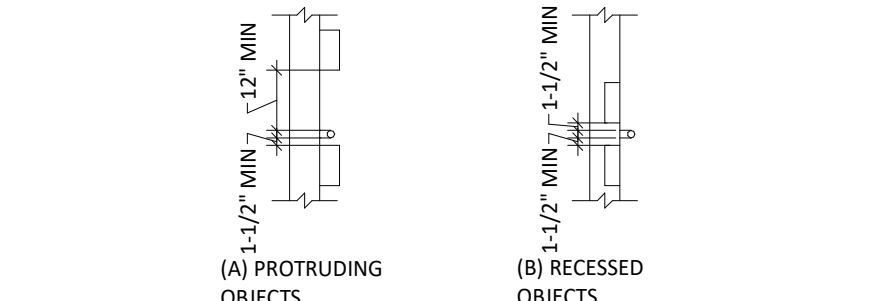
609.2 CROSS SECTION. GRAB BARS SHALL HAVE A CROSS SECTION COMPLYING WITH 609.2.1 OR 609.2.2.

609.2.1 CIRCULAR CROSS SECTION. GRAB BARS WITH CIRCULAR CROSS SECTIONS SHALL HAVE AN OUTSIDE DIAMETER OF 1 1/4" MINIMUM AND 2" MAXIMUM.

609.2.2 NON-CIRCULAR CROSS SECTION. GRAB BARS WITH NON-CIRCULAR CROSS SECTIONS SHALL HAVE A CROSS-SECTION DIMENSION OF 2" MAXIMUM AND A PERIMETER DIMENSION OF 4" MINIMUM AND 4.8" MAXIMUM.



609.3 SPACING. THE SPACE BETWEEN THE WALL AND THE GRAB BAR SHALL BE 1 1/2". THE SPACE BETWEEN THE GRAB BAR AND PROJECTING OBJECTS BELOW AND AT THE ENDS SHALL BE 1 1/2" MINIMUM. THE SPACE BETWEEN THE GRAB BAR AND PROJECTING OBJECTS ABOVE SHALL BE 12" MINIMUM. EXCEPTION: THE SPACE BETWEEN THE GRAB BARS AND SHOWER CONTROLS, SHOWER FITTINGS, AND OTHER GRAB BARS ABOVE SHALL BE PERMITTED TO BE 1 1/2".



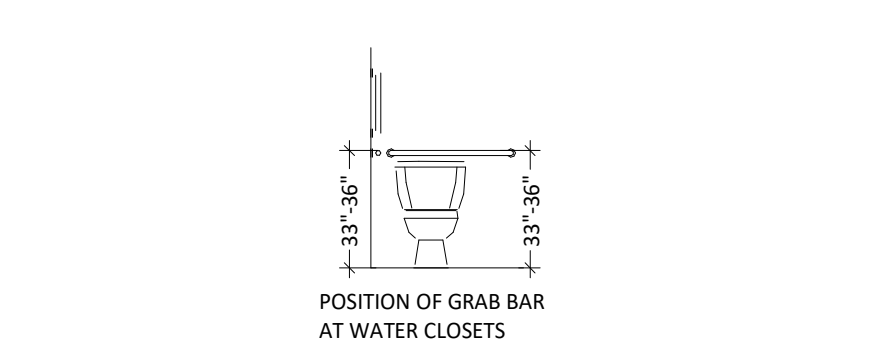
609.4 POSITION OF GRAB BARS. GRAB BARS SHALL BE INSTALLED IN A HORIZONTAL POSITION, 33" MINIMUM AND 36" MAXIMUM ABOVE THE FINISH FLOOR MEASURED TO THE TOP OF THE GRIPPING SURFACE, EXCEPT THAT AT WATER CLOSETS FOR CHILDREN'S USE COMPLYING WITH 604.9, GRAB BARS SHALL BE INSTALLED IN A HORIZONTAL POSITION 18" MINIMUM AND 27" MAXIMUM ABOVE THE FINISH FLOOR MEASURED TO THE TOP OF THE GRIPPING SURFACE. THE HEIGHT OF THE LOWER GRAB BAR ON THE BACK WALL OF A BATHTUB SHALL COMPLY WITH 607.1.1.1 OR 607.4.2.1.

609.5 SURFACE HAZARDS. GRAB BARS AND ANY WALL OR OTHER SURFACES ADJACENT TO GRAB BARS SHALL BE FREE OF SHARP OR ABRASIVE ELEMENTS AND SHALL HAVE ROUNDED EDGES.

609.6 FITTINGS. GRAB BARS SHALL NOT ROTATE WITHIN THEIR FITTINGS.

609.7 INSTALLATION. GRAB BARS SHALL BE INSTALLED IN ANY MANNER THAT PROVIDES A GRIPPING SURFACE AT THE SPECIFIED LOCATIONS AND THAT DOES NOT OBSTRUCT THE REQUIRED CLEAR FLOOR SPACE.

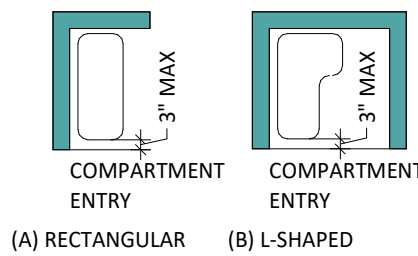
609.8 STRUCTURAL STRENGTH. ALLOWABLE STRESSES SHALL NOT BE EXCEEDED FOR MATERIALS USED WHEN A VERTICAL OR HORIZONTAL FORCE OF 250 POUNDS IS APPLIED AT ANY POINT ON THE GRAB BAR, FASTENER, MOUNTING DEVICE, OR SUPPORTING STRUCTURE.



610 SEATS

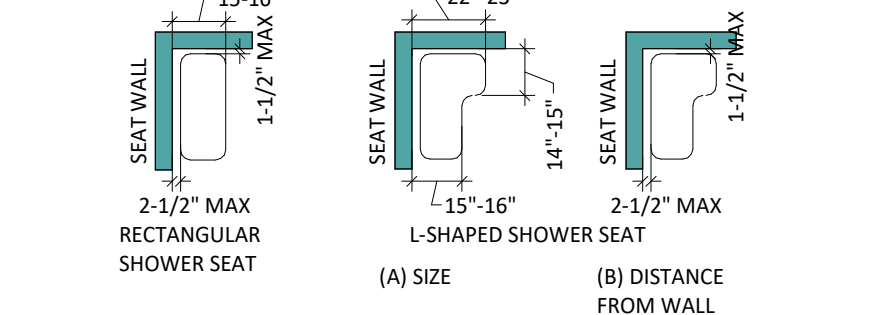
610.1 GENERAL. SEATS IN BATHTUBS AND SHOWER COMPARTMENTS SHALL COMPLY WITH 610.

610.3 SHOWER COMPARTMENT SEATS. WHERE A SEAT IS PROVIDED IN A STANDARD ROLL-IN SHOWER COMPARTMENT, IT SHALL BE A FOLDING TYPE, SHALL BE INSTALLED ON THE SIDE WALL ADJACENT TO THE CONTROLS, AND SHALL EXTEND FROM THE BACK WALL TO A POINT WITHIN 3" OF THE COMPARTMENT ENTRY. WHERE A SEAT IS PROVIDED IN AN ALTERNATE ROLL-IN TYPE SHOWER COMPARTMENT, IT SHALL BE A FOLDING TYPE, SHALL BE INSTALLED ON THE FRONT WALL OPPOSITE THE BACK WALL, AND SHALL EXTEND FROM THE ADJACENT SIDE WALL TO A POINT WITHIN 3" OF THE COMPARTMENT ENTRY. IN TRANSFER-TYPE SHOWERS, THE SEAT SHALL EXTEND FROM THE BACK WALL TO A POINT WITHIN 3" OF THE COMPARTMENT ENTRY. THE TOP OF THE SEAT SHALL BE 17" MINIMUM AND 19" MAXIMUM ABOVE THE BATHROOM FINISH FLOOR. SEATS SHALL COMPLY WITH 610.3.1 OR 610.3.2.



610.3.1 RECTANGULAR SEATS. THE REAR EDGE OF A RECTANGULAR SEAT SHALL BE 21 1/2" MAXIMUM AND THE FRONT EDGE 15" MINIMUM AND 16" MAXIMUM FROM THE SEAT WALL. THE SIDE EDGE OF THE SEAT SHALL BE 1 1/2" MAXIMUM FROM THE ADJACENT WALL.

610.3.2 L-SHAPED SEATS. THE REAR EDGE OF AN L-SHAPED SEAT SHALL BE 21 1/2" MAXIMUM AND THE FRONT EDGE 15" MINIMUM AND 16" MAXIMUM FROM THE SEAT WALL. THE REAR EDGE OF THE "L" PORTION OF THE SEAT SHALL BE 1 1/2" MAXIMUM FROM THE WALL AND THE FRONT EDGE SHALL BE 14" MINIMUM AND 15" MAXIMUM FROM THE WALL. THE END OF THE "L" SHALL BE 22" MINIMUM AND 23" FROM THE MAIN SEAT WALL.



610.4 STRUCTURAL STRENGTH. ALLOWABLE STRESSES SHALL NOT BE EXCEEDED FOR MATERIALS USED WHEN A VERTICAL OR HORIZONTAL FORCE OF 250 POUNDS IS APPLIED AT ANY POINT ON THE SEAT, FASTENER, MOUNTING DEVICE, OR SUPPORTING STRUCTURE.

CHAPTER 7: COMMUNICATION ELEMENTS AND FEATURES

701 GENERAL

701.1 SCOPE. THE PROVISIONS OF CHAPTER 7 SHALL APPLY WHERE REQUIRED BY CHAPTER 2 OR WHERE REFERENCED BY A REQUIREMENT IN THIS DOCUMENT.

702 FIRE ALARM SYSTEMS

702.1 GENERAL. FIRE ALARM SYSTEMS SHALL HAVE PERMANENTLY INSTALLED AUDIBLE AND VISIBLE ALARMS COMPLYING WITH NFPA 72 (1999 OR 2002 EDITION) (INCORPORATED BY REFERENCE, SEE "REFERENCED STANDARDS" IN CHAPTER 1), EXCEPT THAT THE MAXIMUM ALLOWABLE SOUND LEVEL OF AUDIBLE NOTIFICATION APPLIANCES COMPLYING WITH SECTION 4-3.2.1 OF NFPA 72 (1999 EDITION) SHALL HAVE A SOUND LEVEL NO MORE THAN 110 DB AT THE MINIMUM HEARING DISTANCE FROM THE AUDIBLE APPLIANCE. IN ADDITION, ALARMS IN GUEST ROOMS REQUIRED TO PROVIDE COMMUNICATION FEATURES SHALL COMPLY WITH SECTIONS 4-3 AND 4-4 OF NFPA 72 (1999 EDITION) OR SECTIONS 7.4 AND 7.5 OF NFPA 72 (2002 EDITION). EXCEPTION: FIRE ALARM SYSTEMS IN MEDICAL CARE FACILITIES SHALL BE PERMITTED TO BE PROVIDED IN ACCORDANCE WITH INDUSTRY PRACTICE.

703 SIGNS

703.1 GENERAL. SIGNS SHALL COMPLY WITH 703. WHERE BOTH VISUAL AND TACTILE CHARACTERS ARE REQUIRED, EITHER ONE SIGN WITH BOTH VISUAL AND TACTILE CHARACTERS, OR TWO SEPARATE SIGNS, ONE WITH VISUAL, AND ONE WITH TACTILE CHARACTERS, SHALL BE PROVIDED.

703.2 RAISED CHARACTERS. RAISED CHARACTERS SHALL COMPLY WITH 703.2 AND SHALL BE DUPLICATED IN BRAILLE COMPLYING WITH 703.3. RAISED CHARACTERS SHALL BE INSTALLED IN ACCORDANCE WITH 703.4.

703.2.1 DEPTH. RAISED CHARACTERS SHALL BE 1/32 INCH (0.8 MM) MINIMUM ABOVE THEIR BACKGROUND.

703.2.2 CASE. CHARACTERS SHALL BE UPPERCASE.

703.2.3 STYLE. CHARACTERS SHALL BE SANS SERIF. CHARACTERS SHALL NOT BE ITALIC, OBLIQUE, SCRIPT, HIGHLY DECORATIVE, OR OF OTHER UNUSUAL FORMS.

703.2.4 CHARACTER PROPORTIONS. CHARACTERS SHALL BE SELECTED FROM FONTS WHERE THE WIDTH OF THE UPPERCASE LETTER "O" IS 55% MINIMUM AND 110% MAXIMUM OF THE HEIGHT OF THE UPPERCASE LETTER "I".

703.2.5 CHARACTER HEIGHT. CHARACTER HEIGHT MEASURED VERTICALLY FROM THE BASELINE OF THE CHARACTER SHALL BE 5/8" MINIMUM AND 2" MAXIMUM BASED ON THE HEIGHT OF THE UPPERCASE LETTER "I". EXCEPTION: WHERE SEPARATE RAISED AND VISUAL CHARACTERS WITH THE SAME INFORMATION ARE PROVIDED, RAISED CHARACTER HEIGHT SHALL BE PERMITTED TO BE 1/2" MINIMUM.



703.2.6 STROKE THICKNESS. STROKE THICKNESS OF THE UPPERCASE LETTER "I" SHALL BE 15 PERCENT MAXIMUM OF THE HEIGHT OF THE CHARACTER.

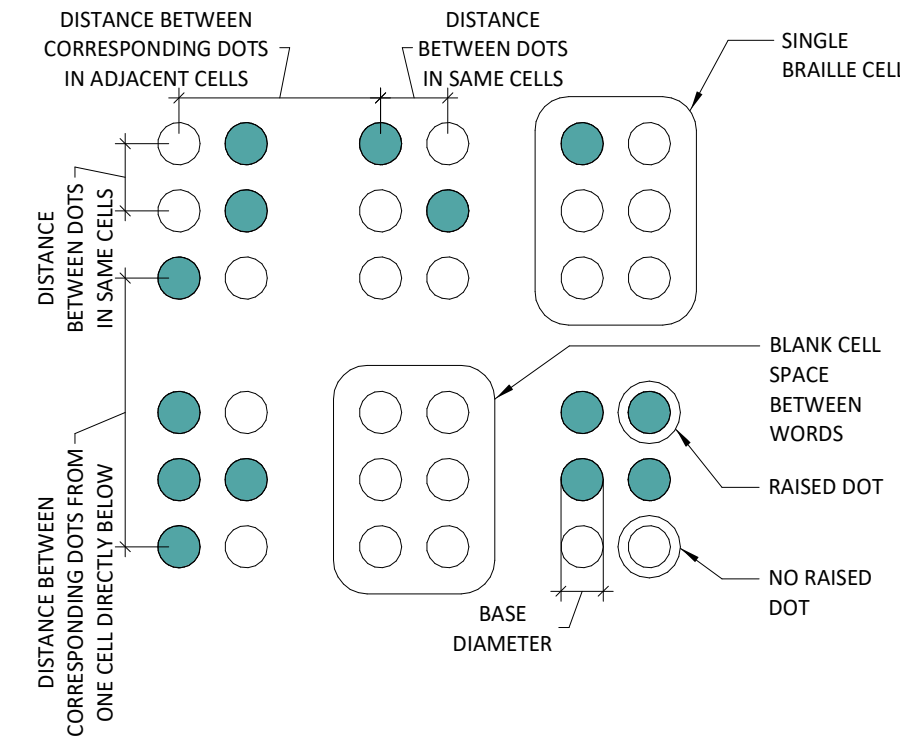
703.2.7 CHARACTER SPACING. CHARACTER SPACING SHALL BE MEASURED BETWEEN THE TWO CLOSEST POINTS OF ADJACENT RAISED CHARACTERS WITHIN A MESSAGE, EXCLUDING WORD SPACES. WHERE CHARACTERS HAVE RECTANGULAR CROSS SECTIONS, SPACING BETWEEN INDIVIDUAL RAISED CHARACTERS SHALL BE 1/8" MINIMUM AND 4 TIMES THE RAISED CHARACTER STROKE WIDTH MAXIMUM. WHERE CHARACTERS HAVE OTHER CROSS SECTIONS, SPACING BETWEEN INDIVIDUAL RAISED CHARACTERS SHALL BE 1/16" MINIMUM AND 4 TIMES THE RAISED CHARACTER STROKE WIDTH MAXIMUM AT THE BASE OF THE CROSS SECTIONS, AND 1/8" MINIMUM AND 4 TIMES THE RAISED CHARACTER STROKE WIDTH MAXIMUM AT THE TOP OF THE CROSS SECTIONS. CHARACTERS SHALL BE SEPARATED FROM RAISED BORDERS AND DECORATIVE ELEMENTS 3/8" MINIMUM.

703.2.8 LINE SPACING. SPACING BETWEEN THE BASELINES OF SEPARATE LINES OF RAISED CHARACTERS WITHIN A MESSAGE SHALL BE 135% MINIMUM AND 17% MAXIMUM OF THE RAISED CHARACTER HEIGHT.

DESIGNED	DRAWN	REVIEWED	APPROVED	REV.	DATE	BY	REMARKS
WILLETT HOFMANN & ASSOCIATES, INC. ENGINEERING ARCHITECTURE LAND SURVEYING 603 32ND AVE. SW CEDAR RAPIDS, IA 52404 1-319-376-1401							
ROCK ISLAND CO MILAN FACILITY 851 10TH AVE W. MILAN, IL 61264							
PHASE							
☐ PRELIM							
☐ PERMIT							
☐ FINAL							
☒ BID							
☐ CONST							
WHA No. 1854D23							
DATE 10/21/2024							
SHEET No. G1.03							

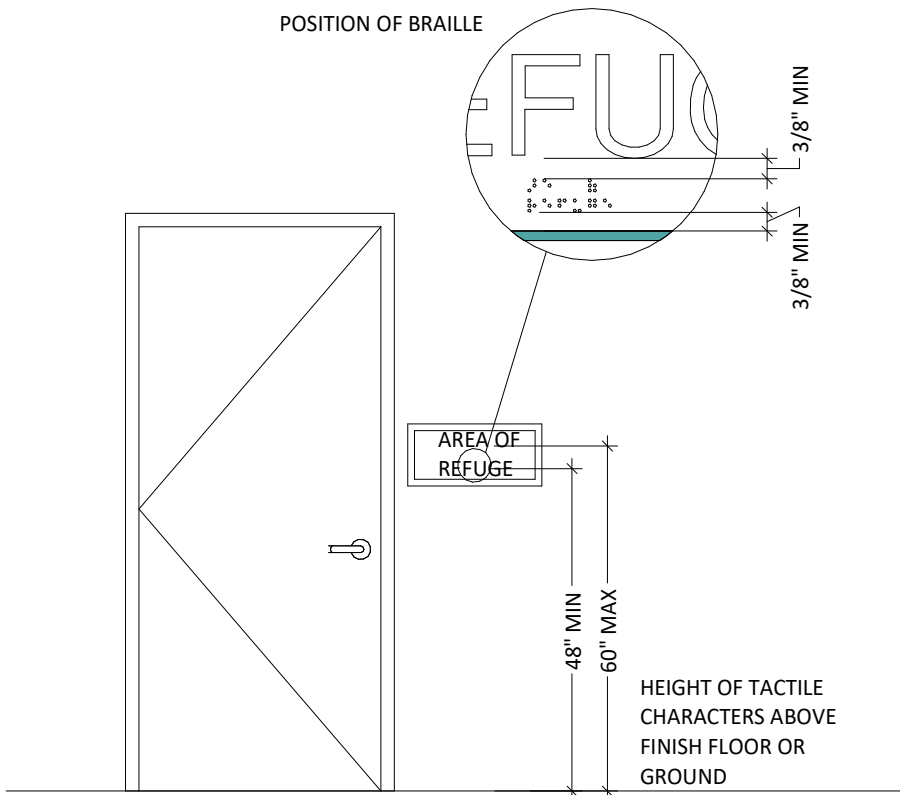
703.3 BRAILLE. BRAILLE SHALL BE CONTRACTED (GRADE 2) AND SHALL COMPLY WITH 703.3 AND 703.4.
703.3.1 DIMENSIONS AND CAPITALIZATION. BRAILLE DOTS SHALL HAVE A DOMED OR ROUNDED SHAPE AND SHALL COMPLY WITH TABLE 703.3.1. THE INDICATION OF AN UPPERCASE LETTER OR LETTERS SHALL ONLY BE USED BEFORE THE FIRST WORD OF SENTENCES, PROPER NOUNS AND NAMES, INDIVIDUAL LETTERS OF THE ALPHABET, INITIALS, AND ACRONYMS.

TABLE 703.3.1 BRAILLE DIMENSIONS	
MEASUREMENT RANGE	MINIMUM IN INCHES MAXIMUM IN INCHES
DOT BASE DIAMETER	0.059 TO 0.063
DISTANCE BETWEEN TWO DOTS IN THE SAME CELL	0.090 TO 0.100
DISTANCE BETWEEN CORRESPONDING DOTS IN ADJACENT CELLS	0.241 TO 0.300
DOT HEIGHT	0.025 TO 0.037
DISTANCE BETWEEN CORRESPONDING DOTS FROM ONE CELL DIRECTLY BELOW	0.395 TO 0.400
1. MEASURED CENTER TO CENTER	

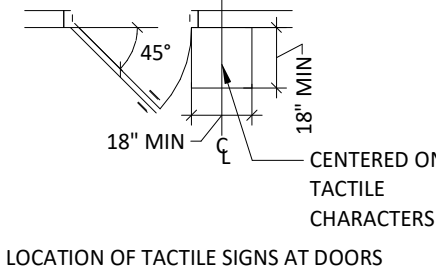


703.3.2 POSITION. BRAILLE SHALL BE POSITIONED BELOW THE CORRESPONDING TEXT. IF TEXT IS MULTI-LINED, BRAILLE SHALL BE PLACED BELOW THE ENTIRE TEXT. BRAILLE SHALL BE SEPARATED 3/8" MINIMUM FROM ANY OTHER TACTILE CHARACTERS AND 3/8" MINIMUM FROM RAISED BORDERS AND DECORATIVE ELEMENTS. EXCEPTION: BRAILLE PROVIDED ON ELEVATOR CAR CONTROLS SHALL BE SEPARATED 3/16" MINIMUM AND SHALL BE LOCATED EITHER DIRECTLY BELOW OR ADJACENT TO THE CORRESPONDING RAISED CHARACTERS OR SYMBOLS.

703.4 INSTALLATION HEIGHT AND LOCATION. SIGNS WITH TACTILE CHARACTERS SHALL COMPLY WITH 703.4.
703.4.1 HEIGHT ABOVE FINISH FLOOR OR GROUND. TACTILE CHARACTERS ON SIGNS SHALL BE LOCATED 48" MINIMUM ABOVE THE FINISH FLOOR OR GROUND SURFACE, MEASURED FROM THE BASELINE OF THE LOWEST TACTILE CHARACTER AND 60" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND SURFACE, MEASURED FROM THE BASELINE OF THE HIGHEST TACTILE CHARACTER. EXCEPTION: TACTILE CHARACTERS FOR ELEVATOR CAR CONTROLS SHALL NOT BE REQUIRED TO COMPLY WITH 703.4.1.



703.4.2 LOCATION. WHERE A TACTILE SIGN IS PROVIDED AT A DOOR, THE SIGN SHALL BE LOCATED ALONGSIDE THE DOOR AT THE LATCH SIDE. WHERE A TACTILE SIGN IS PROVIDED AT DOUBLE DOORS WITH ONE ACTIVE LEAF, THE SIGN SHALL BE LOCATED ON THE INACTIVE LEAF. WHERE A TACTILE SIGN IS PROVIDED AT DOUBLE DOORS WITH TWO ACTIVE LEAFS, THE SIGN SHALL BE LOCATED TO THE RIGHT OF THE RIGHT HAND DOOR. WHERE THERE IS NO WALL SPACE AT THE LATCH SIDE OF A SINGLE DOOR OR AT THE RIGHT SIDE OF DOUBLE DOORS, SIGNS SHALL BE LOCATED ON THE NEAREST ADJACENT WALL. SIGNS CONTAINING TACTILE CHARACTERS SHALL BE LOCATED SO THAT A CLEAR FLOOR SPACE OF 18" MINIMUM BY 18" MINIMUM, CENTERED ON THE TACTILE CHARACTERS, IS PROVIDED BEYOND THE ARC OF ANY DOOR SWING BETWEEN THE CLOSED POSITION AND 45 DEGREE OPEN POSITION. EXCEPTION: SIGNS WITH TACTILE CHARACTERS SHALL BE PERMITTED ON THE PUSH SIDE OF DOORS WITH CLOSERS AND WITHOUT HOLD-OPEN DEVICES



703.5 VISUAL CHARACTERS. VISUAL CHARACTERS SHALL COMPLY WITH 703.5.
EXCEPTION: WHERE VISUAL CHARACTERS COMPLY WITH 703.2 AND ARE ACCOMPANIED BY BRAILLE COMPLYING WITH 703.3, THEY SHALL NOT BE REQUIRED TO COMPLY WITH 703.5.2 THROUGH 703.5.9.
703.5.1 FINISH AND CONTRAST. CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NON-GLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND OR DARK CHARACTERS ON A LIGHT BACKGROUND.
703.5.2 CASE. CHARACTERS SHALL BE UPPERCASE OR LOWERCASE OR A COMBINATION OF BOTH.
703.5.3 STYLE. CHARACTERS SHALL BE CONVENTIONAL IN FORM. CHARACTERS SHALL NOT BE ITALIC, OBLIQUE, SCRIPT, HIGHLY DECORATIVE, OR OF OTHER UNUSUAL FORMS.
703.5.4 CHARACTER PROPORTIONS. CHARACTERS SHALL BE SELECTED FROM FONTS WHERE THE WIDTH OF THE UPPERCASE LETTER "O" IS 55% MINIMUM AND 110% MAXIMUM OF THE HEIGHT OF THE UPPERCASE LETTER "I".
703.5.5 CHARACTER HEIGHT. MINIMUM CHARACTER HEIGHT SHALL COMPLY WITH TABLE 703.5.5. VIEWING DISTANCE SHALL BE MEASURED AS THE HORIZONTAL DISTANCE BETWEEN THE CHARACTER AND AN OBSTRUCTION PREVENTING FURTHER APPROACH TOWARDS THE SIGN. CHARACTER HEIGHT SHALL BE BASED ON THE UPPERCASE LETTER "I".

TABLE 703.5.5 VISUAL CHARACTER HEIGHT		
HEIGHT TO FINISH FLOOR OR GROUND FROM BASELINE OF CHARACTER	HORIZONTAL VIEWING DISTANCE	MINIMUM CHARACTER HEIGHT
40" TO LESS THAN OR EQUAL TO 70"	LESS THAN 72"	5/8"
	72" AND GREATER	5/8", PLUS 1/8" PER FOOT OF VIEWING DISTANCE ABOVE 72"
GREATER THAN 70" TO LESS THAN OR EQUAL TO 120"	LESS THAN 180"	2"
	180" AND GREATER	2", PLUS 1/8" PER FOOT OF VIEWING DISTANCE ABOVE 180"
GREATER THAN 120"	LESS THAN 21"	3"
	21" AND GREATER	3", PLUS 1/8" PER FOOT OF VIEWING DISTANCE ABOVE 21"

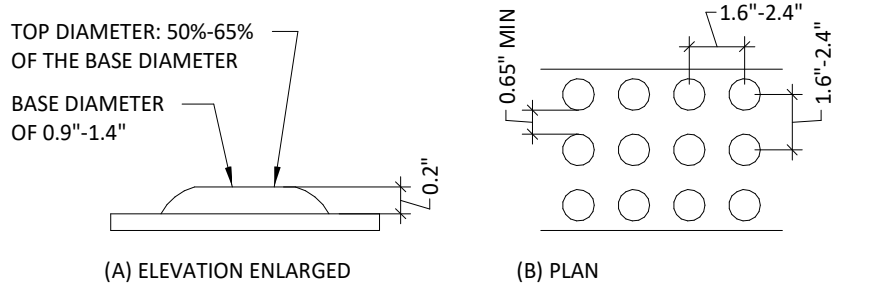
703.5.6 HEIGHT FROM FINISH FLOOR OR GROUND. VISUAL CHARACTERS SHALL BE 40" MINIMUM ABOVE THE FINISH FLOOR OR GROUND. EXCEPTION: VISUAL CHARACTERS INDICATING ELEVATOR CAR CONTROLS SHALL NOT BE REQUIRED TO COMPLY WITH 703.5.6.
703.5.7 STROKE THICKNESS. STROKE THICKNESS OF THE UPPERCASE LETTER "I" SHALL BE 10% MINIMUM AND 30% MAXIMUM OF THE HEIGHT OF THE CHARACTER.
703.5.8 CHARACTER SPACING. CHARACTER SPACING SHALL BE MEASURED BETWEEN THE TWO CLOSEST POINTS OF ADJACENT CHARACTERS, EXCLUDING WORD SPACES. SPACING BETWEEN INDIVIDUAL CHARACTERS SHALL BE 10% MINIMUM AND 35% MAXIMUM OF CHARACTER HEIGHT.
703.5.9 LINE SPACING. SPACING BETWEEN THE BASELINES OF SEPARATE LINES OF CHARACTERS WITHIN A MESSAGE SHALL BE 135% MINIMUM AND 170% MAXIMUM OF THE CHARACTER HEIGHT.
703.6 PICTOGRAMS. PICTOGRAMS SHALL COMPLY WITH 703.6.
703.6.1 PICTOGRAM FIELD. PICTOGRAMS SHALL HAVE A FIELD HEIGHT OF 6" MINIMUM. CHARACTERS AND BRAILLE SHALL NOT BE LOCATED IN THE PICTOGRAM FIELD.
703.6.2 FINISH AND CONTRAST. PICTOGRAMS AND THEIR FIELD SHALL HAVE A NON-GLARE FINISH. PICTOGRAMS SHALL CONTRAST WITH THEIR FIELD WITH EITHER A LIGHT PICTOGRAM ON A DARK FIELD OR A DARK PICTOGRAM ON A LIGHT FIELD.
703.6.3 TEXT DESCRIPTORS. PICTOGRAMS SHALL HAVE TEXT DESCRIPTORS LOCATED DIRECTLY BELOW THE PICTOGRAM FIELD. TEXT DESCRIPTORS SHALL COMPLY WITH 703.2, 703.3 AND 703.4.

703.7 SYMBOLS OF ACCESSIBILITY. SYMBOLS OF ACCESSIBILITY SHALL COMPLY WITH 703.7.
703.7.1 FINISH AND CONTRAST. SYMBOLS OF ACCESSIBILITY AND THEIR BACKGROUND SHALL HAVE A NON-GLARE FINISH. SYMBOLS OF ACCESSIBILITY SHALL CONTRAST WITH THEIR BACKGROUND WITH EITHER A LIGHT SYMBOL ON A DARK BACKGROUND OR A DARK SYMBOL ON A LIGHT BACKGROUND.
703.7.2 SYMBOLS.
703.7.2.1 INTERNATIONAL SYMBOL OF ACCESSIBILITY. THE INTERNATIONAL SYMBOL OF ACCESSIBILITY SHALL COMPLY WITH FIGURE 703.7.2.1.



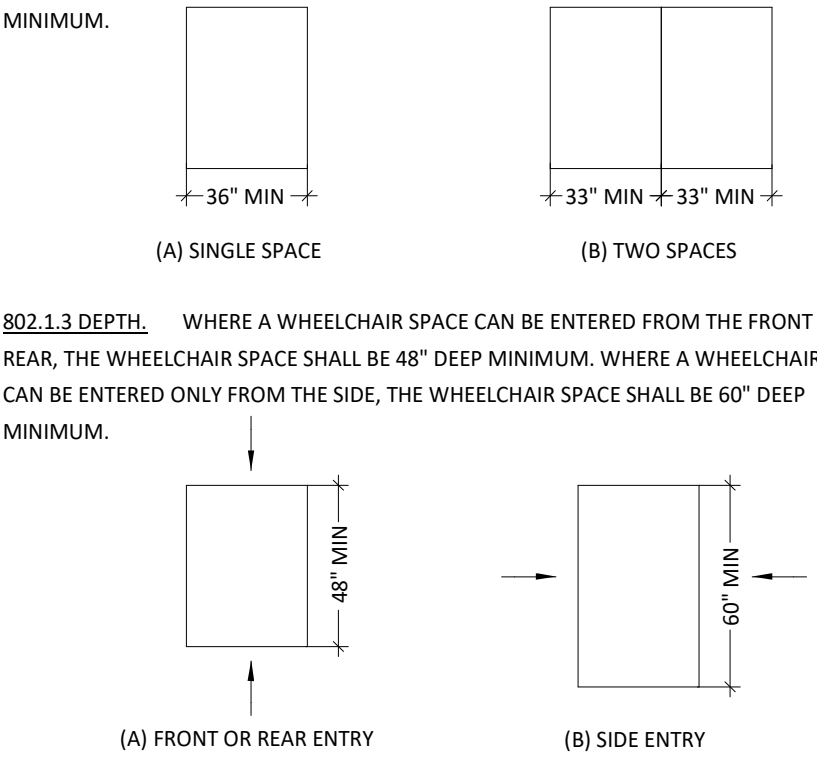
ROOM NAME
R O O M N A M E

705 DETECTABLE WARNINGS
705.1 GENERAL. DETECTABLE WARNINGS SHALL CONSIST OF A SURFACE OF TRUNCATED DOMES AND SHALL COMPLY WITH 705.
705.1.1 DOME SIZE. TRUNCATED DOMES IN A DETECTABLE WARNING SURFACE SHALL HAVE A BASE DIAMETER OF 0.9" MINIMUM AND 1.4" (36 MM) MAXIMUM, A TOP DIAMETER OF 50% OF THE BASE DIAMETER MINIMUM TO 65% OF THE BASE DIAMETER MAXIMUM, AND A HEIGHT OF 0.2".
705.1.2 DOME SPACING. TRUNCATED DOMES IN A DETECTABLE WARNING SURFACE SHALL HAVE A CENTER-TO-CENTER SPACING OF 1.6" MINIMUM AND 2.4" MAXIMUM, AND A BASE-TO-BASE SPACING OF 0.65" MINIMUM, MEASURED BETWEEN THE MOST ADJACENT DOMES ON A SQUARE GRID.
705.1.3 CONTRAST. DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT WALKING SURFACES EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT.
705.2 PLATFORM EDGES. DETECTABLE WARNING SURFACES AT PLATFORM BOARDING EDGES SHALL BE 24" WIDE AND SHALL EXTEND THE FULL LENGTH OF THE PUBLIC USE AREAS OF THE PLATFORM.



CHAPTER 8: SPECIAL ROOMS, SPACES, AND ELEMENTS

801 GENERAL
801.1 SCOPE. THE PROVISIONS OF CHAPTER 8 SHALL APPLY WHERE REQUIRED BY CHAPTER 2 OR WHERE REFERENCED BY A REQUIREMENT IN THIS DOCUMENT.
802 WHEELCHAIR SPACES, COMPANION SEATS, AND DESIGNATED AISLE SEATS
802.1 WHEELCHAIR SPACES. WHEELCHAIR SPACES SHALL COMPLY WITH 802.1.
802.1.1 FLOOR OR GROUND SURFACE. THE FLOOR OR GROUND SURFACE OF WHEELCHAIR SPACES SHALL COMPLY WITH 302. CHANGES IN LEVEL ARE NOT PERMITTED. EXCEPTION: SLOPES NOT STEEPER THAN 1:48 SHALL BE PERMITTED.
802.1.2 WIDTH. A SINGLE WHEELCHAIR SPACE SHALL BE 36" WIDE MINIMUM WHERE TWO ADJACENT WHEELCHAIR SPACES ARE PROVIDED, EACH WHEELCHAIR SPACE SHALL BE 33" WIDE MINIMUM.

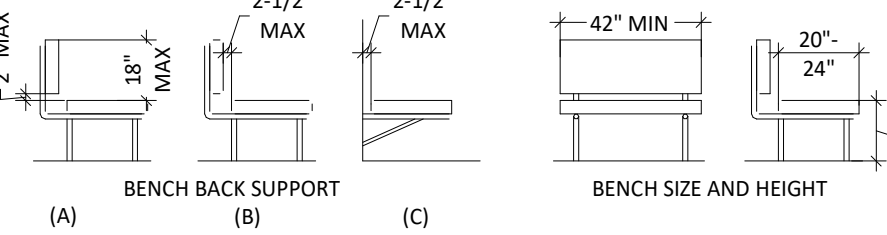


802.1.3 DEPTH. WHERE A WHEELCHAIR SPACE CAN BE ENTERED FROM THE FRONT OR REAR, THE WHEELCHAIR SPACE SHALL BE 48" DEEP MINIMUM. WHERE A WHEELCHAIR SPACE CAN BE ENTERED ONLY FROM THE SIDE, THE WHEELCHAIR SPACE SHALL BE 60" DEEP MINIMUM.

802.1.4 APPROACH. WHEELCHAIR SPACES SHALL ADJOIN ACCESSIBLE ROUTES. ACCESSIBLE ROUTES SHALL NOT OVERLAP WHEELCHAIR SPACES.
802.1.5 OVERLAP. WHEELCHAIR SPACES SHALL NOT OVERLAP CIRCULATION PATHS.

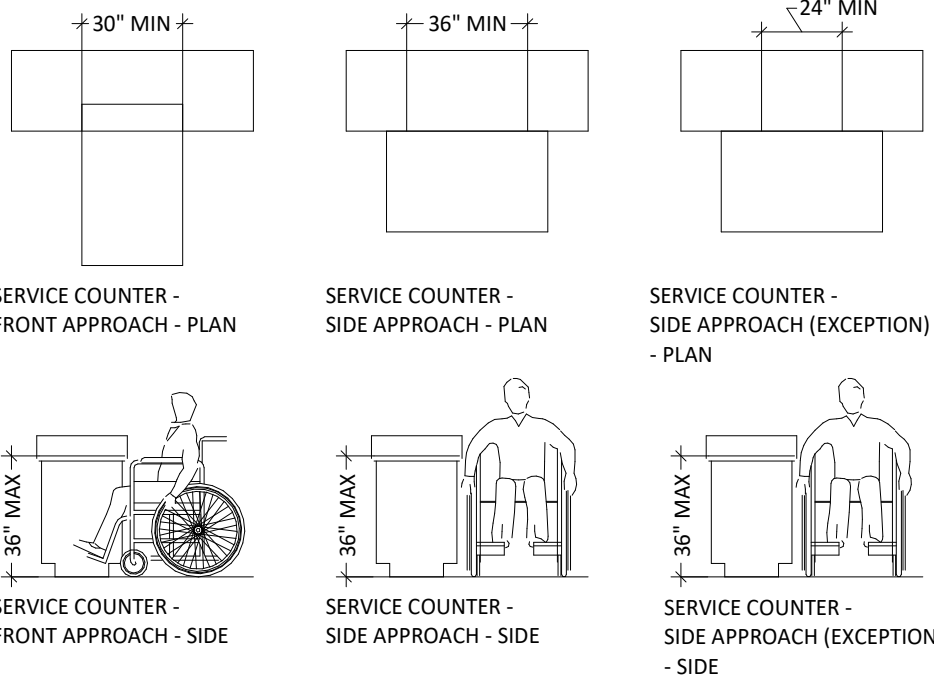
CHAPTER 9: BUILT-IN ELEMENTS

902 DINING SURFACES AND WORK SURFACES
902.1 GENERAL. DINING SURFACES AND WORK SURFACES SHALL COMPLY WITH 902.2 AND 902.3.
902.2 CLEAR FLOOR OR GROUND SPACE. A CLEAR FLOOR SPACE COMPLYING WITH 305 POSITIONED FOR FORWARD APPROACH SHALL BE PROVIDED. KNEE AND TOE CLEARANCE COMPLYING WITH 306 SHALL BE PROVIDED.
902.3 HEIGHT. THE TOPS OF DINING SURFACES AND WORK SURFACES SHALL BE 28" MINIMUM AND 34" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND.
902.4 DINING SURFACES AND WORK SURFACES FOR CHILDREN'S USE. ACCESSIBLE DINING SURFACES AND WORK SURFACES FOR CHILDREN'S USE SHALL COMPLY WITH 902.4. EXCEPTION: DINING SURFACES AND WORK SURFACES THAT ARE USED PRIMARILY BY CHILDREN 5 YEARS AND YOUNGER SHALL NOT BE REQUIRED TO COMPLY WITH 902.4 WHERE A CLEAR FLOOR OR GROUND SPACE COMPLYING WITH 305 POSITIONED FOR A PARALLEL APPROACH IS PROVIDED.
902.4.1 CLEAR FLOOR OR GROUND SPACE. A CLEAR FLOOR SPACE COMPLYING WITH 305 POSITIONED FOR A FORWARD APPROACH SHALL BE PROVIDED. KNEE AND TOE CLEARANCE COMPLYING WITH 306 SHALL BE PROVIDED, EXCEPT THAT KNEE CLEARANCE 24" MINIMUM ABOVE THE FINISH FLOOR OR GROUND SHALL BE PERMITTED.
902.4.2 HEIGHT. THE TOPS OF TABLES AND COUNTERS SHALL BE 26" MINIMUM AND 30" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND.
903 BENCHES
903.1 GENERAL. BENCHES SHALL COMPLY WITH 903.
903.2 CLEAR FLOOR OR GROUND SPACE. CLEAR FLOOR OR GROUND SPACE COMPLYING WITH 305 SHALL BE PROVIDED AND SHALL BE POSITIONED AT THE END OF THE BENCH SEAT AND PARALLEL TO THE SHORT AXIS OF THE BENCH.
903.3 SIZE. BENCHES SHALL HAVE SEATS THAT ARE 42" LONG MINIMUM AND 20" DEEP MINIMUM AND 24" DEEP MAXIMUM.
903.4 BACK SUPPORT. THE BENCH SHALL PROVIDE FOR BACK SUPPORT OR SHALL BE AFFIXED TO A WALL. BACK SUPPORT SHALL BE 42" LONG MINIMUM AND SHALL EXTEND FROM A POINT 2" MAXIMUM ABOVE THE SEAT SURFACE TO A POINT 18" MINIMUM ABOVE THE SEAT SURFACE. BACK SUPPORT SHALL BE 2½" MAXIMUM FROM THE REAR EDGE OF THE SEAT MEASURED HORIZONTALLY.
903.5 HEIGHT. THE TOP OF THE BENCH SEAT SURFACE SHALL BE 17" MINIMUM AND 19" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND.



903.6 STRUCTURAL STRENGTH. ALLOWABLE STRESSES SHALL NOT BE EXCEEDED FOR MATERIALS USED WHEN A VERTICAL OR HORIZONTAL FORCE OF 250 POUNDS IS APPLIED AT ANY POINT ON THE SEAT, FASTENER, MOUNTING DEVICE, OR SUPPORTING STRUCTURE.
903.7 WET LOCATIONS. WHERE INSTALLED IN WET LOCATIONS, THE SURFACE OF THE SEAT SHALL BE SLIP RESISTANT AND SHALL NOT ACCUMULATE WATER.

904 CHECK-OUT AISLES AND SALES AND SERVICE COUNTERS
904.1 GENERAL. CHECK-OUT AISLES AND SALES AND SERVICE COUNTERS SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF 904.
904.4 SALES AND SERVICE COUNTERS. SALES COUNTERS AND SERVICE COUNTERS SHALL COMPLY WITH 904.4.1 OR 904.4.2. THE ACCESSIBLE PORTION OF THE COUNTER TOP SHALL EXTEND THE SAME DEPTH AS THE SALES OR SERVICE COUNTER TOP. EXCEPTION: IN ALTERATIONS, WHEN THE PROVISION OF A COUNTER COMPLYING WITH 904.4 WOULD RESULT IN A REDUCTION OF THE NUMBER OF EXISTING COUNTERS AT WORK STATIONS OR A REDUCTION OF THE NUMBER OF EXISTING MAIL BOXES, THE COUNTER SHALL BE PERMITTED TO HAVE A PORTION WHICH IS 24" LONG MINIMUM COMPLYING WITH 904.4.1 PROVIDED THAT THE REQUIRED CLEAR FLOOR OR GROUND SPACE IS CENTERED ON THE ACCESSIBLE LENGTH OF THE COUNTER.
904.4.1 PARALLEL APPROACH. A PORTION OF THE COUNTER SURFACE THAT IS 36" LONG MINIMUM AND 36" HIGH MAXIMUM ABOVE THE FINISH FLOOR SHALL BE PROVIDED. A CLEAR FLOOR OR GROUND SPACE COMPLYING WITH 305 SHALL BE POSITIONED FOR A PARALLEL APPROACH ADJACENT TO THE 36" MINIMUM LENGTH OF COUNTER. EXCEPTION: WHERE THE PROVIDED COUNTER SURFACE IS LESS THAN 36" LONG, THE ENTIRE COUNTER SURFACE SHALL BE 36" HIGH MAXIMUM ABOVE THE FINISH FLOOR.
904.4.2 FORWARD APPROACH. A PORTION OF THE COUNTER SURFACE THAT IS 30" LONG MINIMUM AND 36" HIGH MAXIMUM SHALL BE PROVIDED. KNEE AND TOE SPACE COMPLYING WITH 306 SHALL BE PROVIDED UNDER THE COUNTER. A CLEAR FLOOR OR GROUND SPACE COMPLYING WITH 305 SHALL BE POSITIONED FOR A FORWARD APPROACH TO THE COUNTER.



PROJECT SUMMARY

1. This project involves an addition and renovation of the existing ground floor locker room and fixture and finish replacement of the second floor restroom.

Contractor note: Not all the work will be confined to the specific boundaries and designated Items as shown on the drawings. Work necessary for any connections to mechanical or electrical equipment and that fall outside the confines of the designated areas, are still considered part of the work. The boundaries or locations shown are to designate the principal areas of the remodeling and are intended to show the preferred extent of Contractor's primary activity, which allows Owner's use of the remaining spaces. The building will be continuously occupied during normal business hours. In some instances, the Owner may have events scheduled after hours. Therefore, the contractor must take precautions to protect the safety of occupants present in the building at all times.

DIVISION 1- GENERAL NOTES

- Owner Furnished Items- None
- Schedule: The Owner's preferred schedule is to have all work substantially complete as soon as possible. The Contractor shall provide a schedule of work and a list of those priorities and needs germane to his completing the work within the prescribed time limits for Owner and Architect's review and consideration. It is the intent of the Owner to cooperate and assist the Contractor to achieve this schedule. The Contractor will have access to all areas of the site and building immediately upon award of the contract.
- Temporary Facilities: Water and Electrical services will be available to the Contractor at the Owner's expense. Conserve power and water usage during construction. Coordinate use of electrical services with Owner. Provide temporary distribution for power tools and construction equipment that isolates construction activity from Owner's normal use, and protect existing distribution equipment from overloads and spikes or drops in service.
- Seal all areas of the work by taping off the doors of each room or similar method to prevent dust migration. Clean any public areas outside rooms every day following construction activity.
- Contractor will need to coordinate with the owner of the location(s) for temporarily staging of materials.
- The contractor must cooperate with the Owner's need for security anywhere within the existing facility, and as the work affects any of the existing building services, such as electrical power and gas. Security concerns will be reviewed during the pre-construction with the Owner.
- Provide construction barriers around all areas of proposed work to protect the general public and the Owner's operations employees from construction activity. Clean any public areas outside barriers every day following construction activity
- Cutting and patching of existing walls, ceilings and floors may be necessary as a part of this work. Confirm condition and construction of all walls and existing construction slated to remain. No additional compensation will be made for minor patching necessary after existing wall finish, floor finish are removed, or for those surfaces that remain.
- Payments to the Contractor will be made following the procedure listed in the project manual and after Contractor has completed and submitted an application for payment on AIA form G701 and 702.
- Become aware of any buried utility lines or hidden elements on or near the area of construction and protect same during construction.
- Notify Owner and Architect prior to cutting or modifying any utility lines
- All streets and drives shall remain open at all times during construction. Park only in designated spaces
- Storage of materials on-site shall be approved by owner.
- Familiarize yourself with all on-site conditions prior to construction and notify Owner and Architect of any discrepancies discovered with investigation.
- The Owner's normal business hours are 8:00 AM to 5 PM M-F.

- Coordinate egress requirements with Owner and local Fire Marshall prior to beginning construction. Egress around the construction areas will be required at all times. The exact manner of egress during any point of construction shall be negotiated with the Owner and Fire Marshall.
- Provide material submittals in a timely manner to coordinate with construction timing and material flow. Allow for a minimum of one week for review.
- Provide necessary trained technical personnel to layout work on site.
- Final clean site prior to requesting final review for substantial completion. Substantial completion will not be certified until entire site is cleaned and all of this Contractor's materials and equipment are removed and properly disposed.
- The specific manufacturers and materials listed below are for the contractor's guidance for the level of quality and performance in the finished work on this project. If the contractor wishes to make a substitution of any of the listed materials or manufacturers, the substitution must be made in writing prior to the bid, and if found acceptable will be included in an addendum. It is the Owner and Architect's intent to not make any substitutions after the bid.

DIVISION 2- SITE WORK

- Any discrepancies between the notes on that sheet and those shown below shall revert to those on the plan sheet.
- Contractors shall review each area of work to familiarize themselves with the effort required and precautions necessary to pursue the work and protect existing spaces, or building exteriors to remain.
- Clean all areas and spaces where the selective demolition and preparation work has occurred. Remove paint, mortar, oils, putty and any other accessory items of similar nature.
- All fill material under slabs-on-grade shall consist of controlled granular fill compacted to at least 95% of maximum standard proctor dry density, and be a minimum of 6" deep.
- Demolish, remove and properly dispose of all materials, features and appurtenances including but not limited to paving, excavated soils, masonry, wall framing and gypsum board and accessories.

DIVISION 3- CONCRETE

- All concrete design and construction shall conform to the basic building code requirements and those of the latest edition of following American Concrete Institute Standards: ACI #'s 318, 301, 315, 347, 305, and 306
- All concrete used in the work shall be normal weight with the following 28-day compressive strengths: Exterior Slabs-on-grade- 4000#
- All Reinforcing steel shall be in accordance with the following standards:
 - Rebars- ASTM 615 Grade 60
- Maintain the minimum concrete coverage for reinforcing as indicated unless otherwise noted on the drawings:
 - 3" clear where concrete is deposited directly against earth
 - 2" clear where concrete is exposed to earth or weather but poured against forms for bars #6 and larger
 - 1-1/2" clear where concrete is exposed to earth or weather but poured against forms for bars #5 and smaller
 - ¾" clear for concrete slabs and wall surfaces not exposed to earth or weather
- Bend all horizontal bars 36 bar diameters past each corner or provide equivalent corner bars matching horizontal reinforcement.
- Submit proposed design mixes for review prior to delivering any concrete. Mix designs shall give the dry weight of cement, dry weight fly ash, saturated dry weights of coarse and fine aggregate, brand name and quantity of admixtures where applicable, and gallons of water, all as required for one cubic yard of concrete. Submit source of both fine and coarse aggregates.

DIVISION 4- MASONRY

- Provide concrete block, brick & accessories to match existing in accordance with BIA Series 21 notes and NCMA Standards, in effect during time of construction
- Typical reference standards for masonry shall include ASTM C129, C140, C144, C207, C270, NCMA TEK 23A and the Uniform Building Code/ UBC 24-22.
- Comply with all applicable standards of the local governing body for the type of work shown.
- Mortar: Portland Cement, ASTM C150, Type 1.
Hydrated Lime- Type S
Aggregate ASTM C144
Natural Grey color, Type S Mortar mix for use in both brick and block
- Grout: ASTM C476 for bond beams- 28-day strength: 2500#
- Block: Load bearing standard weight hollow core units to match existing, conforming to ASTM C90, Type 1, Grade N. Minimum compressive strength of units shall be 2000#. Nominal sizes: 8"x8"x16". Provide special shapes for lintels, corners, jambs, sash, control joints, headers and other special conditions.
- Rebars, similar to requirements for use in concrete, ASTM A615, Grade 60. Shop fabricates all bent or hooked units. No field bending will be allowed
- Horizontal reinforcing shall be truss-type 9 gauge. galvanized wire in 10" width by length required for all 12" thick masonry walls. Space horizontal reinforcing at 16" o.c. vertically unless shown otherwise.
- Anchoring devices- utilize minimum 16 gauge bent corrugated strap metal or 3/8" diameter bent rod stock for connection to existing walls.
- Flashings- see Division 7.
- Masonry Cleaner- use Sure Clean 600. Wash all exposed surfaces of completed masonry walls before proceeding with any other construction steps, such as attaching the roof or painting. Comply with manufacturers recommended procedures for use of cleaner.
- Cut all masonry units as necessary to fit with configuration of new structure. Utilize motor driven masonry saws and cut units to fit configuration. Utilize special shapes for jambs and to connect to existing walls
- Build walls straight, level and plumb utilizing the following tolerances: Plumb- max ¼" in 10' in height. Level- max 1/8" in 10' of length
- Rake all joints nominal 3/8" tooled concave.

DIVISION 5- METALS

- Submit shop drawings and indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations and details where applicable. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.
 - Material Quality shall conform to the following standards: Steel Sections: ASTM A36. Steel Tubing: ASTM A500, Grade B, ASTM A501, ASTM A53, Grade B. Bolts, Nuts and Washers: ASTM A307.
- Welding Materials: AWS DI. 1; type required for materials being welded.
- For fabrication of hand and guard railings and other miscellaneous pieces and all accessories, comply with the following: Verify dimensions prior to shop fabrication. Fabricate items with joints tightly fitted and secured. Fit and shop assemble in largest practical sections, for delivery to site. Grind exposed welds flush and smooth with adjacent finished surface. Ease exposed edges to small uniform radius. Exposed Mechanical Fastenings: Flush countersunk screws or bolts, nonobtrusively located, consistent with design of structure, except where specifically noted otherwise. Make exposed joints butt tight, flush, and hairline.
- Supply components required for anchorage of metal fabrications. Fabricate anchorage and related components of same material and finish as metal fabrication, except where specifically noted otherwise.
- Clean surfaces of rust, scale, grease and foreign matter prior to finishing. Do not prime steel surfaces in direct contact bond with concrete or where field welding is required. Prime paint all steel fabricated items with one coat.

DIVISION 7- THERMAL/MOISTURE PROTECTION

- Provide sealants appropriate to the surrounding construction. All sealants shall be from a single source. Sealant shall be white interior grade latex for all areas to be painted. Seal all gaps between counter tops or cabinets and adjacent wall surfaces with clear sealant. All sealants for exterior use shall be one-part urethane such as NP-1 as manufactured by Sonneborn or Architect approved equivalent.

DIVISION 8- DOORS AND HARDWARE

- Provide 3'x7'-0"x1'-3/4" flush insulated hollow metal door with 3'-4" x 7'-4" x 4'-7/8" hollow metal frames for block walls to match existing as closely as possible, as manufactured by Ceco, Curries, Amweld, or Architect approved equivalent. FIELD VERIFY ROUGH OPENING PRIOR TO ORDERING DOOR
- Frames shall be attached to the walls with a minimum of 3 anchors/jamb. Anchor bottom of frame to floor with clip angle and expansion bolts.
- Frames shall be standard welded type 16 gauge with mitered, coped and butted stops, pre-machined for hinges and hardware. All exposed surfaces dressed smooth, flush and prime-painted.
- All hardware cutouts shall have a closed metal mortising box welded to frame. (See door hardware description below for details of hardware to be included)
- Provide rated 16-gauge hollow metal frames for all openings shown between enclosed spaces and surrounding corridors or links.
- Doors shall be standard welded 18-gauge galvanized steel, full flush construction reinforced with top and bottom channels, fully insulated and bonded to face sheets. All welds ground smooth. Provide undercut to allow for selected threshold.
- Hinge schedule: Stanley or equal, with non-removable pins, 1-1/2 pair per door typical.
- Lever type latch-set: Interior latchsets shall be manufactured by Schlage or equal, style and function to be chosen by Architect, mortised-type installation required.
- Door Bottom Sweep: by Reese Co or equal
- Provide silencers in all hollow metal frames.
- Provide solid core rated wood doors for all interior openings that match existing. Finish veneer shall be close-grained birch capable of receiving stain color to match existing.
- Wood door shall be solid core, 5-ply, 1-3/4" thickness, premium grade veneered, fully- banded, complying with AWI Standards for premium grade with warranty for the full life of the doors. Provide fire-treated units for rated applications. Rails and stiles shall be appropriate to the scheduled hardware and use. Coordinate with hardware to be provided.
- Prep doors and frames for the selected hardware, mortised type latch sets and hinges involved.
- Place frames per Standard 100 of the Steel Door Institute, plumb, aligned and braced securely.
- Doors shall be equipped with Extra Heavy Duty Grade hardware as follows:
 - Hinges: Stanley or equal, with non-removable pins, 1-1/2 pair per door typical.
 - Lock Set: Lever type as manufactured by Schlage or equal, style and function to be chosen by Architect, mortised-type installation required.
 - Closers: LCN or equal
 - Smoke Strip Package: Full perimeter neoprene bulb type by Reese Co or equal
 - Kickplate: Reese or equal
 - Wall-Type Door Stops: by Reese Co or Equal
 - Threshold: Reese or equal
 - Door Bottom Sweep: by Reese Co or equal
- All fasteners shall be stainless steel and made to harmonize with selected hardware
- Hardware Finish: US26D, brushed stainless steel or Owner directed type to match existing hardware elsewhere in facility.
- Coordinate keying with Owner's master schedule
- Each door shall have: 1-1/2 Pr Hinges
 - Lock Set- (Office Function for purposes of bid)
 - Closer
 - Smoke seal package
 - Threshold
- Coordinate hardware with Owner's master schedule of model #'s and types.

DIVISION 9- FINISHES

- SPECIAL NOTE: Any wall surface affected by work in this project shall be re-coated and refinished to obtain a smooth uninterrupted and unblemished surface. For instance, if a wall mounted item is moved and results in mounting holes exposed from the original location, the holes shall be filled, and the entire wall surface shall be refinished (meaning the holes, blemishes and discolorations shall all be properly treated and the surface, from corner to corner, floor to ceiling, shall be repainted).
- Provide metal stud framed gyp-board walls, where existing walls are shown to be replaced or modified. Utilize 25 gauge 3-5/8" metal studs typically.
- Provide 20-gauge sheet metal backing in walls where any wall-mounted fixtures, grab bars or brackets of any kind are to be installed. Backing shall span a minimum of 2 studs and be fully anchored to studs prior to applying wallboards and finishes. Height of backing shall correspond to 2X the height of the item to be wall-mounted in the locations as shown on the drawings
- Provide 5/8" gyp board for all interior surfaces (use type-X gyp board for any fire rated walls). Fasten to framing utilizing self-tapping screws. Fill all screw holes and joints prior to paint. Comply with expected quality for commercial grade construction for plumb, square and level to achieve defect-free results.
- Utilize gypsum wall-board products and accessories as manufactured by USG or approved equivalent.
- Final installation shall have a smooth, continuous, uninterrupted surface free of break joints or seams.
- Paint only when temperature is 50 degrees or warmer, and relative humidity is less than 85%
- Take precautions to protect all existing floor finishes from construction activity. If damaged, replace with matching units.
- Provide ceramic wall and floor tile in areas as shown on the plans. Utilize the tile products to match existing as close as possible. Provide coved ceramic tile base matching the floor tile and by the same manufacturer. Comply with all manufacturers recommendations for tile installation procedures and completed work. Utilize subcontractors familiar with ceramic tile work and acceptable to the Owner.
- Provide 4" vinyl or rubber base for all other general office areas as manufactured by Johnsonite, Armstrong or Architect approved equivalent.
- Utilize paint products manufactured by Sherwin Williams or Architect approved equivalent and as shown on the Owner's finish board from the original remodeling.
- For all metal surfaces, provide 1 rust-inhibitive type prime coat and 2 finish coats of industrial enamel
- For all gyp board surfaces, provide one coat latex primer and cover with two coats eggshell enamel.
- For all masonry surfaces, provide 1 coat commercial block filler, 1 coat primer and 2 coats eggshell enamel.
- Paint all exposed surfaces of gyp board, block and prime painted metals

DIVISION 10- SPECIALTIES

- Provide Grab Bars in configurations matching existing or in new configurations as designated on the plans, and as manufactured by Bobrick or Architect approved equivalent.
- Provide metal framed chrome-finished mirrors in locations as shown on the drawings and in sizes similar to the existing units. Coordinate sizes prior to ordering units. Sizes as shown on the drawings are approximate and all mirror sizes must be field verified. Provide adequate sub-framing behind the mirrors to provide support for new units. Mirrors shall be as manufactured by Bobrick or Architect approved equivalent.
- Provide solid plastic toilet partitions and partition hardware to match existing as closely as possible; as manufactured by Bobrick, ASI, Bradley, or Global.
 - Where designated, provide restroom accessories as follows:
 - Provide Bobrick Model B-2888 for a typical surface mounted stainless-steel toilet paper dispenser, or architect approved equivalent.
 - Provide Bobrick Model B-2860 for a typical surface mounted stainless-steel roll-type paper towel dispenser, or architect approved equivalent.
 - Provide Bobrick Model B-279 for wall-mounted stainless-steel trash receptacle, or architect approved equivalent.
 - Provide Bobrick Model B-2706 25 for wall-mounted stainless-steel napkin/ tampon vendor, or architect approved equivalent.
 - Install soap dispensers, toilet-paper dispensers as directed by the Owner and in compliance with ADA requirements for clearances and mounting heights.
- Provide Wisconsin Bench LBSADA 20 x 48 x 17 ¼" ADA Locker Room Bench with seat and without backrest.

TYPICAL PLUMBING FIXTURE AND ACCESSORIES MATRIX

The following are makes and models of acceptable products for bid. If the contractors wish to use and alternate products, a formal request for substitution must be made prior to bidding. Refer to Mechanical and Plumbing and report any discrepancies to Architect prior to procurement.

FIXTURE	MANUFACTURER	MODEL #	Notes
Sink Trim	Sloan	EBF-650-BAT-TEE-CP-0.5GPM-MLM-IR-BT-FCT	Chrome Finish-Optima Sensor Automatic
Lavatory Tempering Valve	Powers	Series LFe480	Lead Free-rough bronze finish
Overflow Plugs	Dearborn Brass	760-1	Semi-cast Grid Patent Overflow plug w 1-1/4" x 6" 17 ga tailpiece
Lav Guard 2	Truebro-IPC Corp	covers	
Electric Water Coolers	Elkay	Model LZSTL8WSLP	EWC with bottle filling station; bi-level
EWC accessory apron	Elkay	Model LKAPREZL	For mounting on open walls, not in alcoves
Toilet seat-standard	Bemis	Model 2L2155T	White-for existing units only
Tank Type toilet	Bemis	Model 19555SCT	White-for new units
Grab bars	Kohler	Highline Class Five Model K-3979-RA	White
SS shelf	Bobrick	B-6806 1-1/2" dia SS with snap flanges	Satin finish SS with peened grip surface
Robe Hook	Bobrick	B-295 x length reqd-typ 24"	Satin finish SS
	Bobrick	B-6727	Satin finish SS
Shower Seat	Bobrick	B-5181	Solid white phenolic seat with satin finish SS
Mirror with SS frame	Bobrick	B-165 2436 typ	Satin Finish SS
Floor Drain with round strainer	Watts	FD-100-A	Typical 2" pipe size
Toilet Partitions	ASI	Solid Phenolic Floor Mount OH braced	All SS hardware
Hand soap dispenser	Bobrick	B-2111	WAll mounted SS with hardware
Toilet paper dispenser	Bobrick	B-2888	WAll mounted SS with hardware
Hand towel dispenser	Bobrick	B-2620	WAll mounted SS with hardware

REMARKS

DESIGNED
DRAWN
REVIEWED
APPROVED

WILLETT HOFMANN
& ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SURVEYING
603 32ND AVE SW CEDAR RAPIDS, IA 52404
1-319-378-1401

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

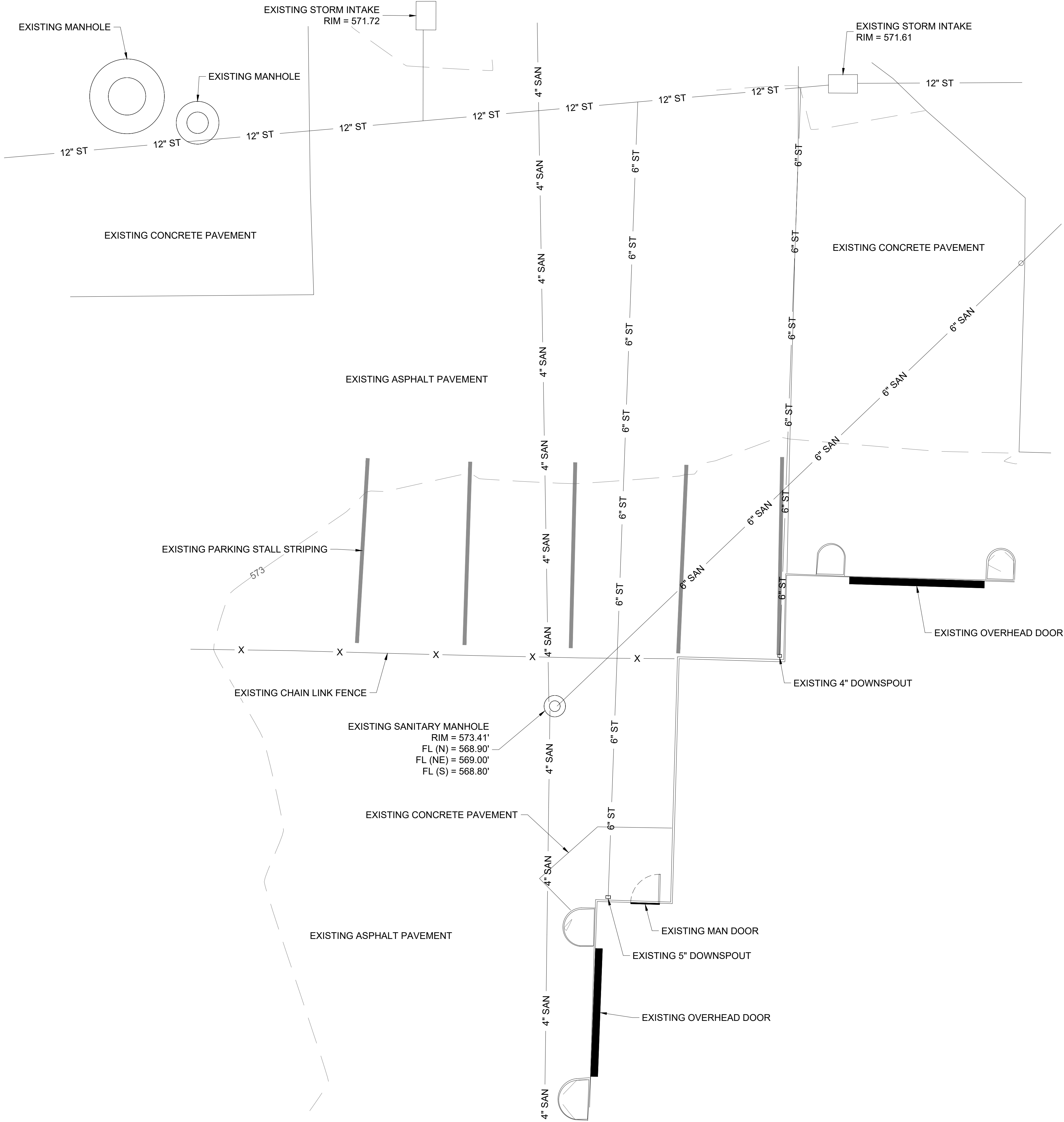
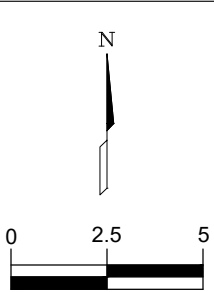
PHASE
☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST
☐

WHA No.
1854D23

DATE
10/21/2024

SHEET
No.
G1.05

This document is the copyrighted property of Willett, Hoffmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hoffmann & Associates, Inc.



PHASE

☐ PRELIM

☐ PERMIT

☐ FINAL

☒ BID

☐ CONST

WHA No.

1854D23

DATE

10/21/24

SHEET No.

C.01

ROCK ISLAND CO MILAN FACILITY

851 10TH AVE W, MILAN, IL 61264

EXISTING CONDITIONS

WILLET HOFMANN & ASSOCIATES, INC.

ENGINEERING ARCHITECTURE LAND SURVEYING

625 32ND AVE SW CEDAR RAPIDS, IA 52404

T: 319-278-1401

#YEAR

DESIGNED JMT

DRAWN JMT

REVIEWED MGD

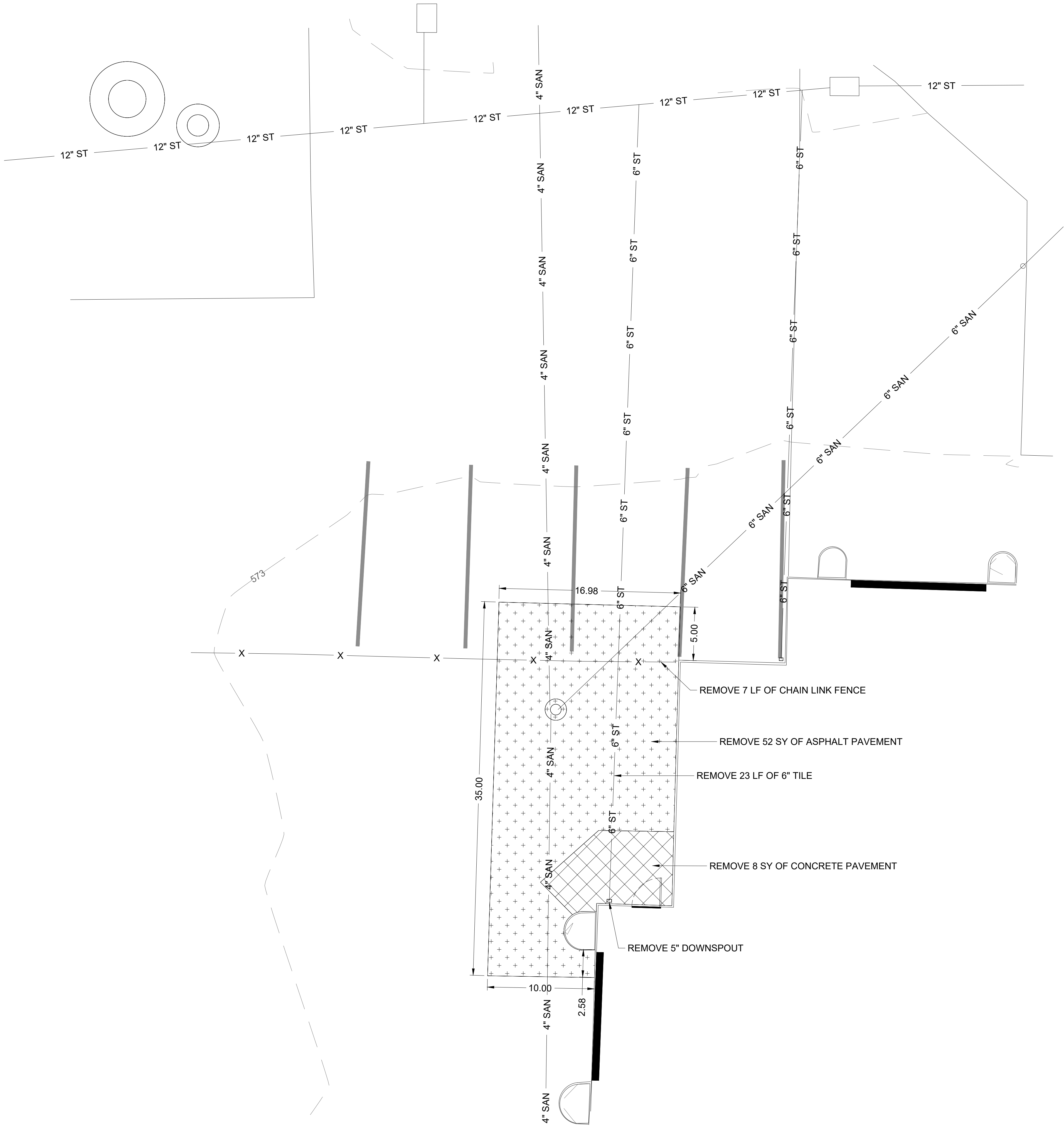
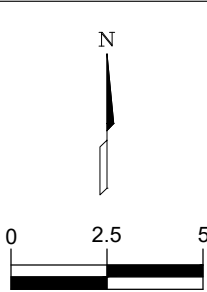
APPROVED MGD

REV

DATE

BY

REMARKS



PHASE

☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

DATE
10/21/24

SHEET
No.
C.02

REMOVALS

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

Willet, Hoffmann & Associates, Inc. and may not be copied or used by any person without written permission. © Copyright

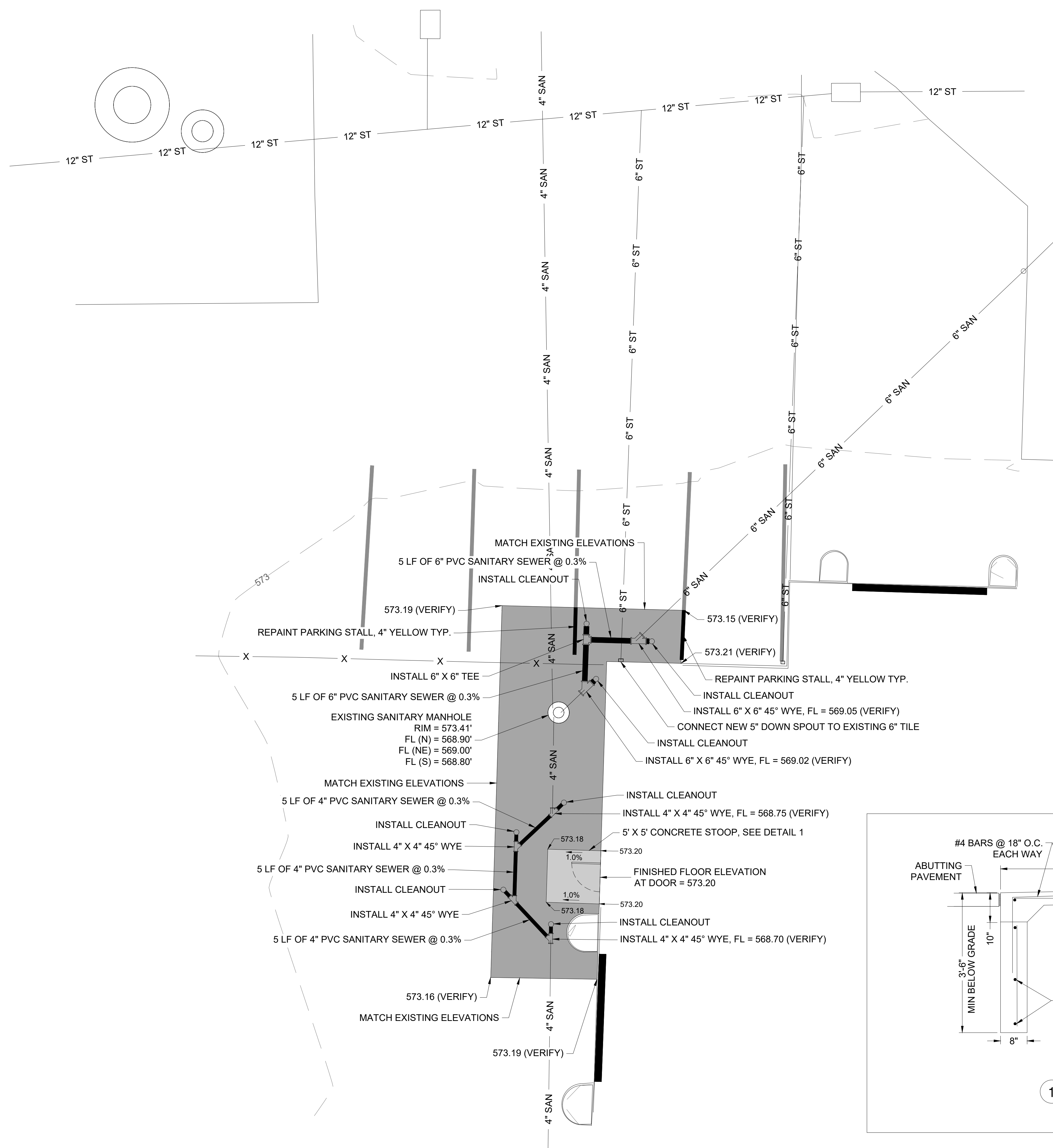
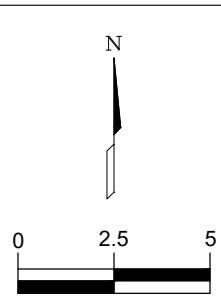
Willet Hoffmann
& Associates, Inc.
ENGINEERING ARCHITECTURE LAND SURVEYING
625 32ND AVE SW CEDAR RAPIDS, IA 52404
T: 319-278-1401

Willet Hoffmann & Associates, Inc.
#YEAR

DESIGNED JMT
DRAWN JMT
REVIEWED MGD
APPROVED MGD

REV DATE BY

REMARKS



NOTES:
1) THE PROPOSED H.M.A. PAVEMENT SHALL HAVE THE SAME THICKNESS AND SUBBASE AS THE EXISTING H.M.A. PAVEMENT.

LEGEND

P.C.C. PAVEMENT

H.M.A. PAVEMENT

DESIGNED		JMT		REV		DATE		BY		REMARKS	
DRAWN	JMT	DRAWN	JMT								
REVIEWED	MGD	REVIEWED	MGD								
APPROVED	MGD	APPROVED	MGD								

WILLETT HOFMANN & ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SURVEYING
625 32ND AVE SW CEDAR RAPIDS, IA 52404
T: 319-278-1401

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

SITE PLAN

PHASE

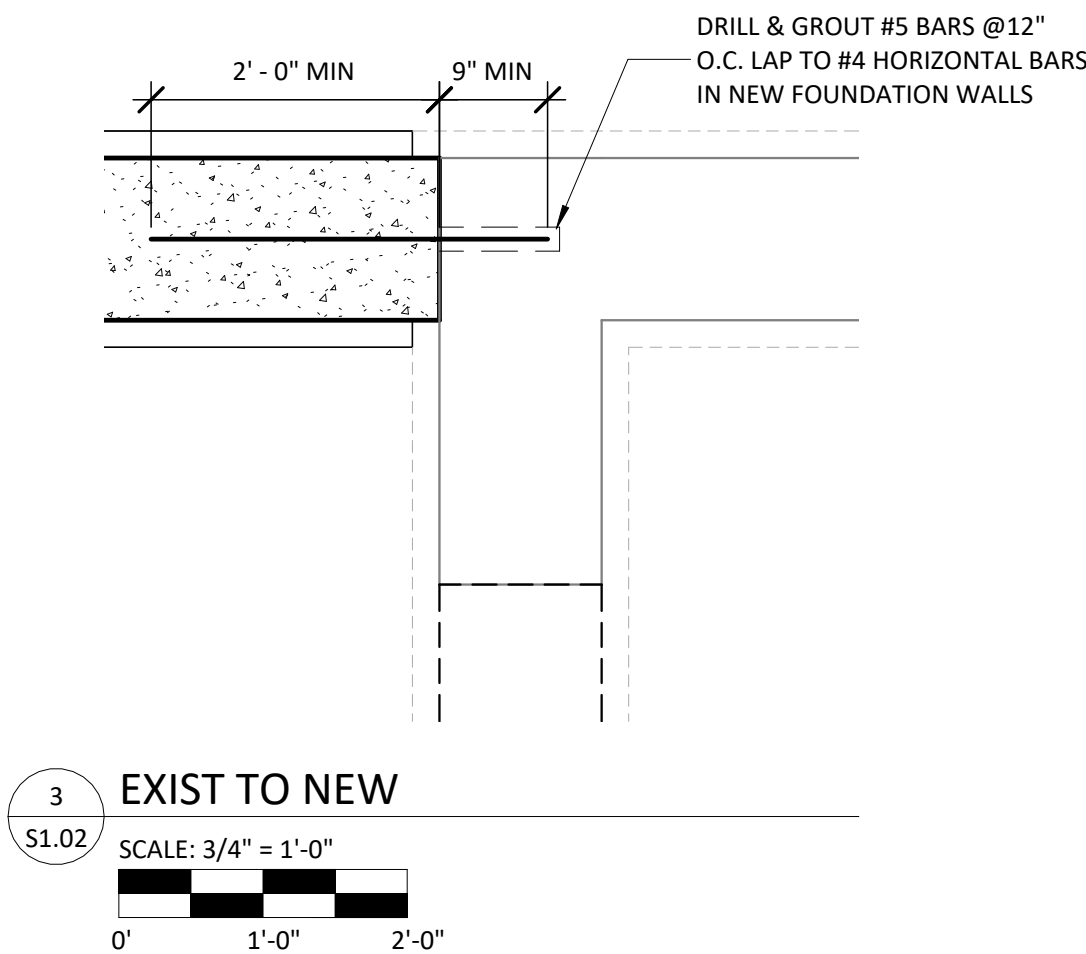
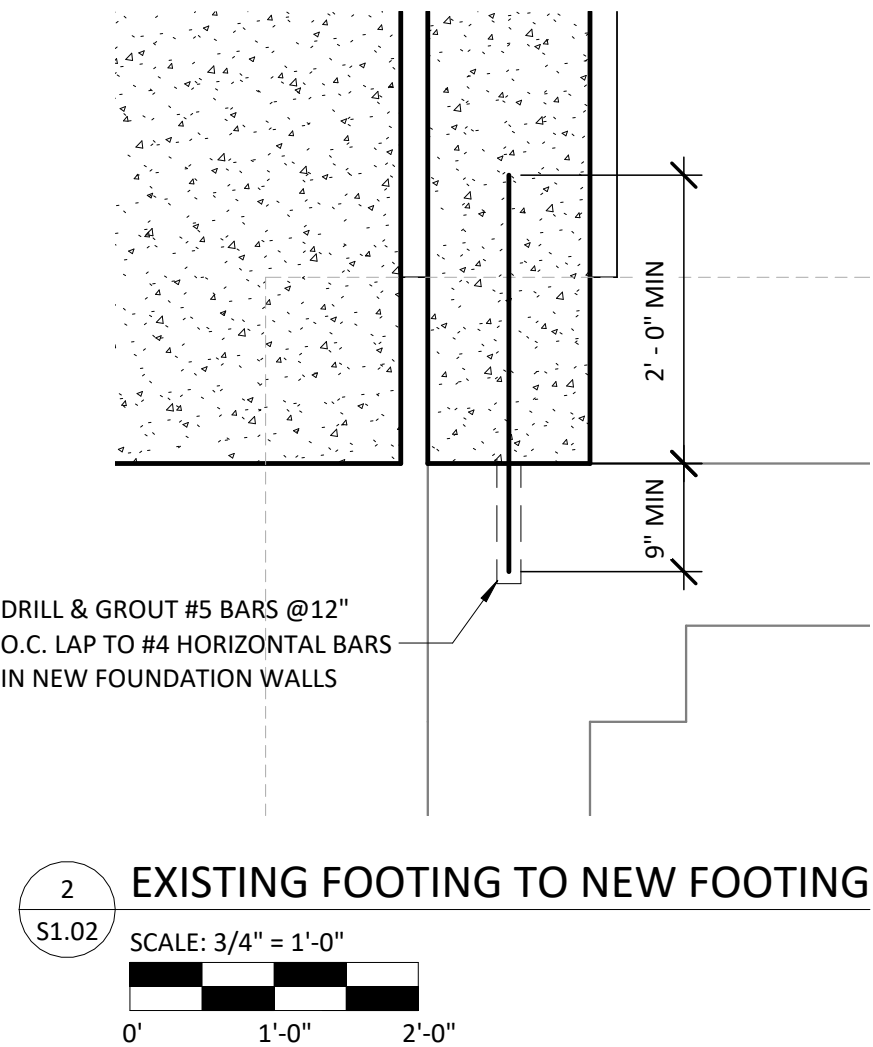
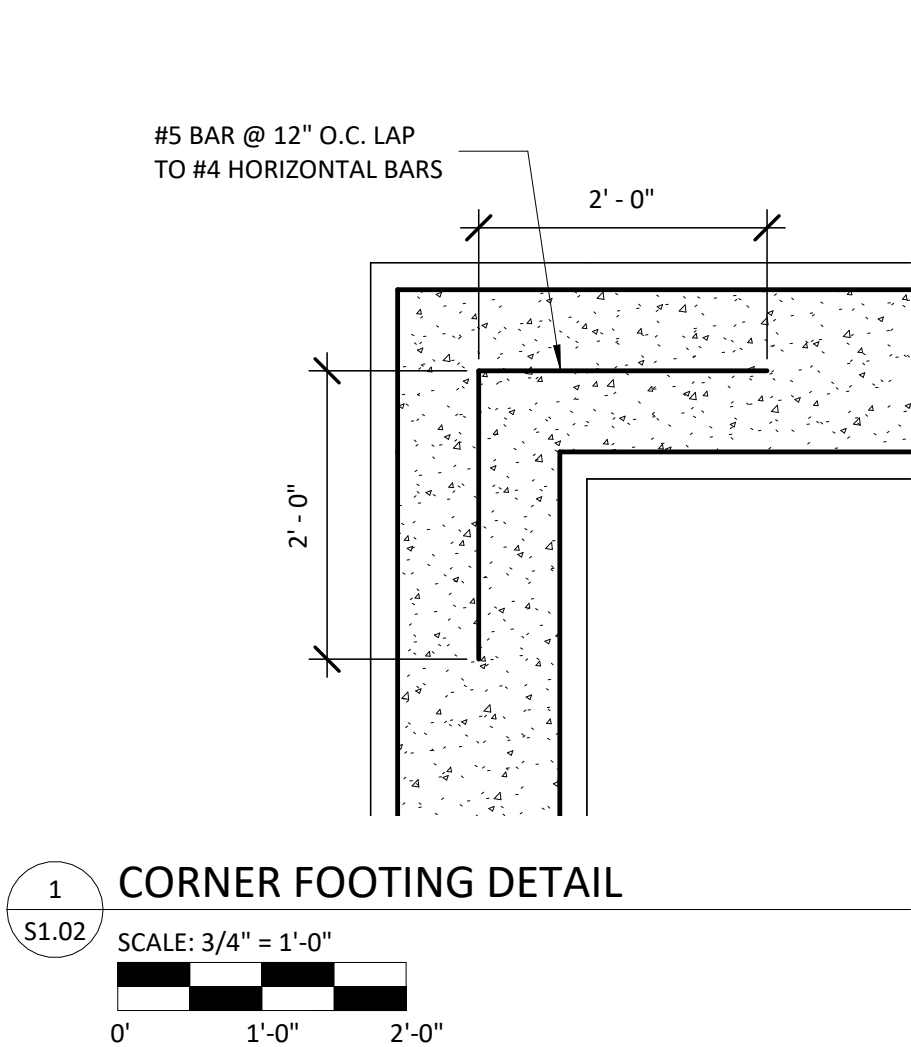
- ☐ PRELIM
- ☐ PERMIT
- ☐ FINAL
- ☒ BID
- ☐ CONST

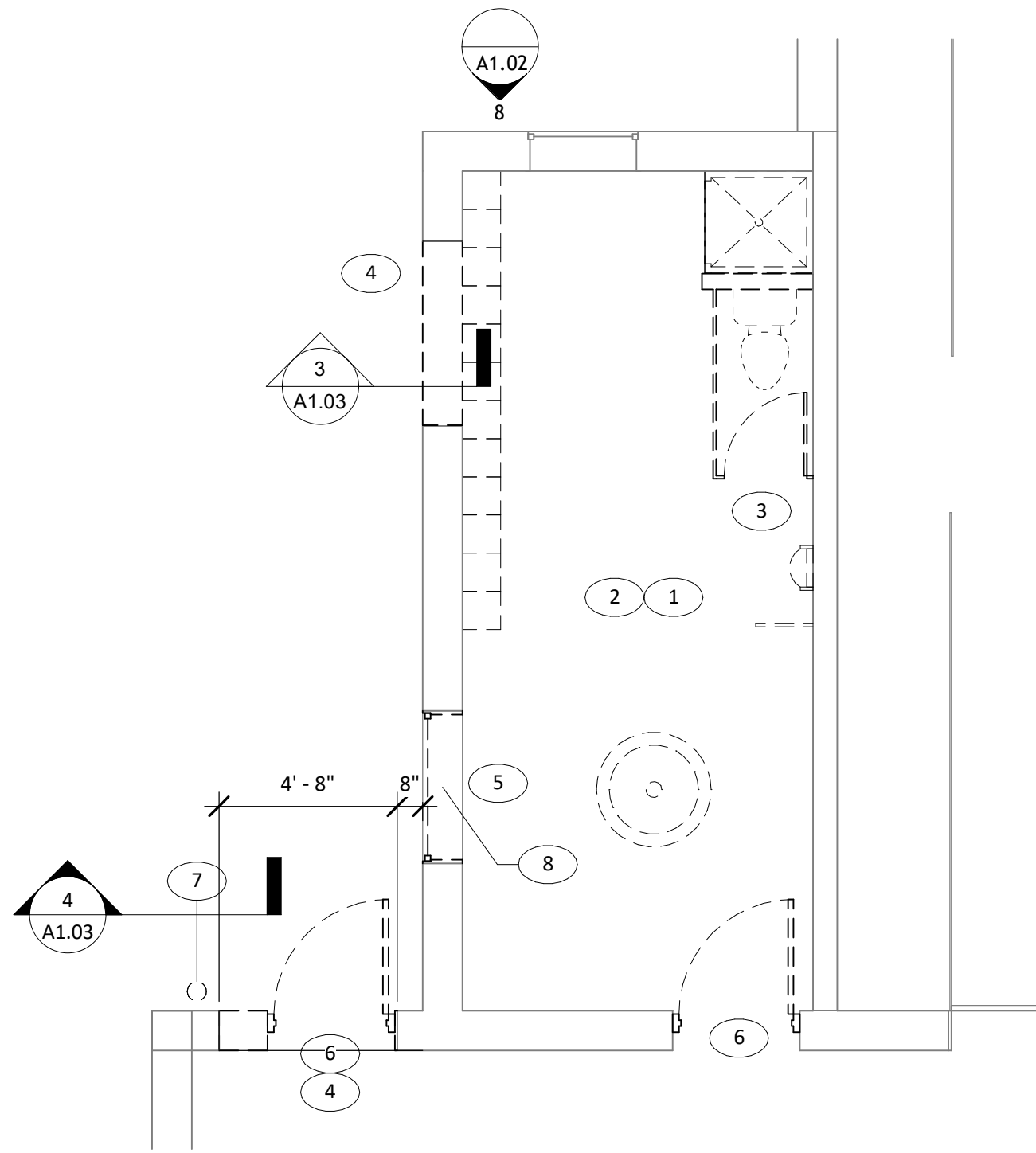
WHA No.
1854D23

DATE
10/21/24

SHEET No.
C.03

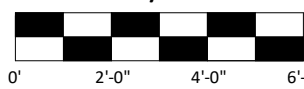
This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hofmann & Associates, Inc. #YEAR





1 FIRST FLOOR LOCKER ROOM DEMO PLAN

SCALE: 1/4" = 1'-0"



FINISH SPECIFICATIONS

ALL FINISHES SHALL MEET ALL CLASS A FIRE RATINGS & COMPLY WITH CHAPTER 8 OF INTERNATIONAL BUILDING CODE.

CERAMIC TILE

CT1 MFG: DAL TILE
TYPE: 12"x24" FIELD TILE,
3" BULLNOSE AT TOP OF WAINSCOT
PATTERN: STACKED BOND
COLOR: JET SETTER DUSK

SC1 SEALED CONCRETE

WALL BASE

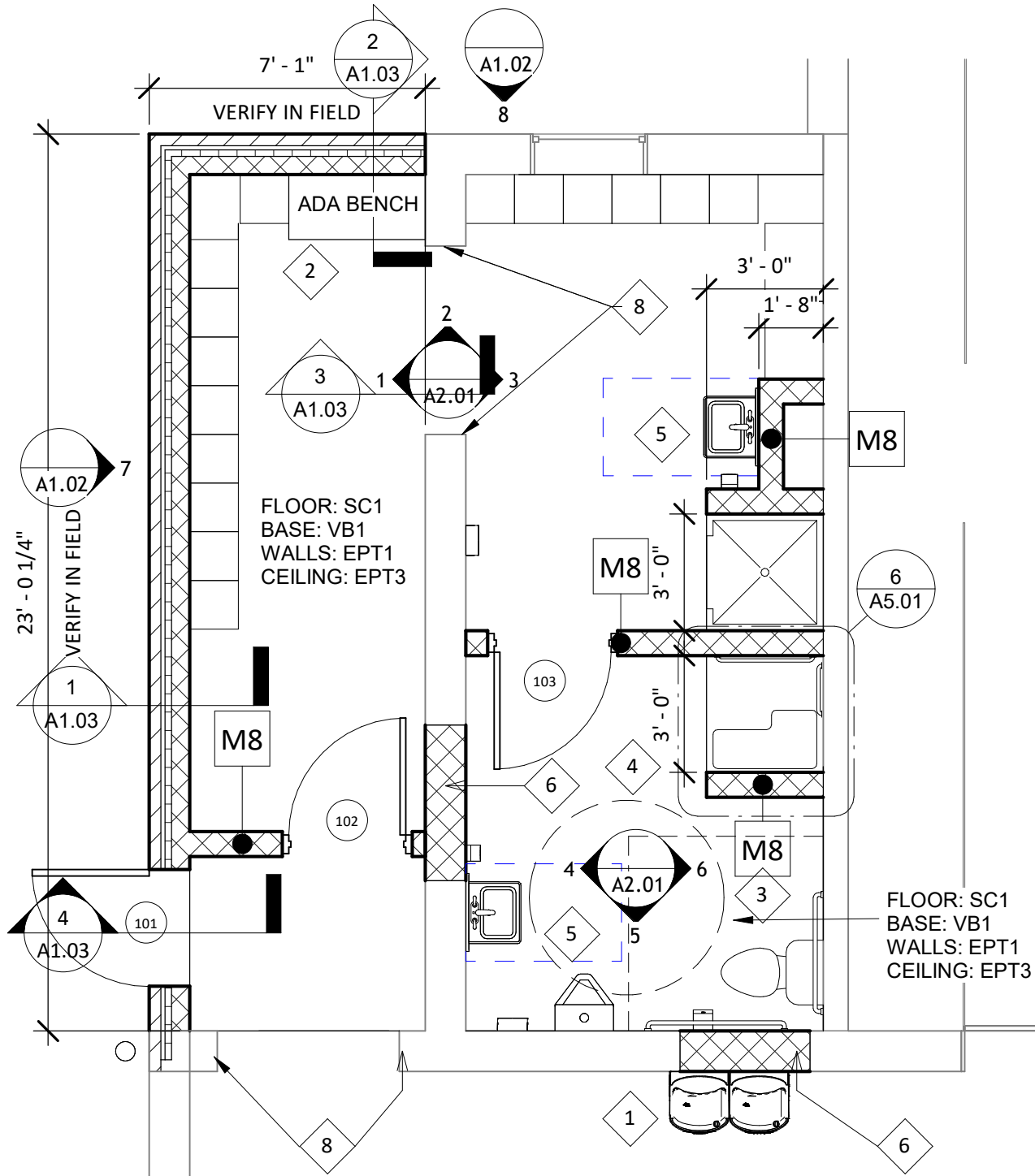
VB1 MFG: TARKETT
TYPE: 4" ROLL STOCK VINYL WALL BASE
COLOR: 20 CHARCOAL WG

EPOXY PAINT

EPT1 MFG: SHERWIN WILLIAMS
COLOR: SNOWBOUND SW7004

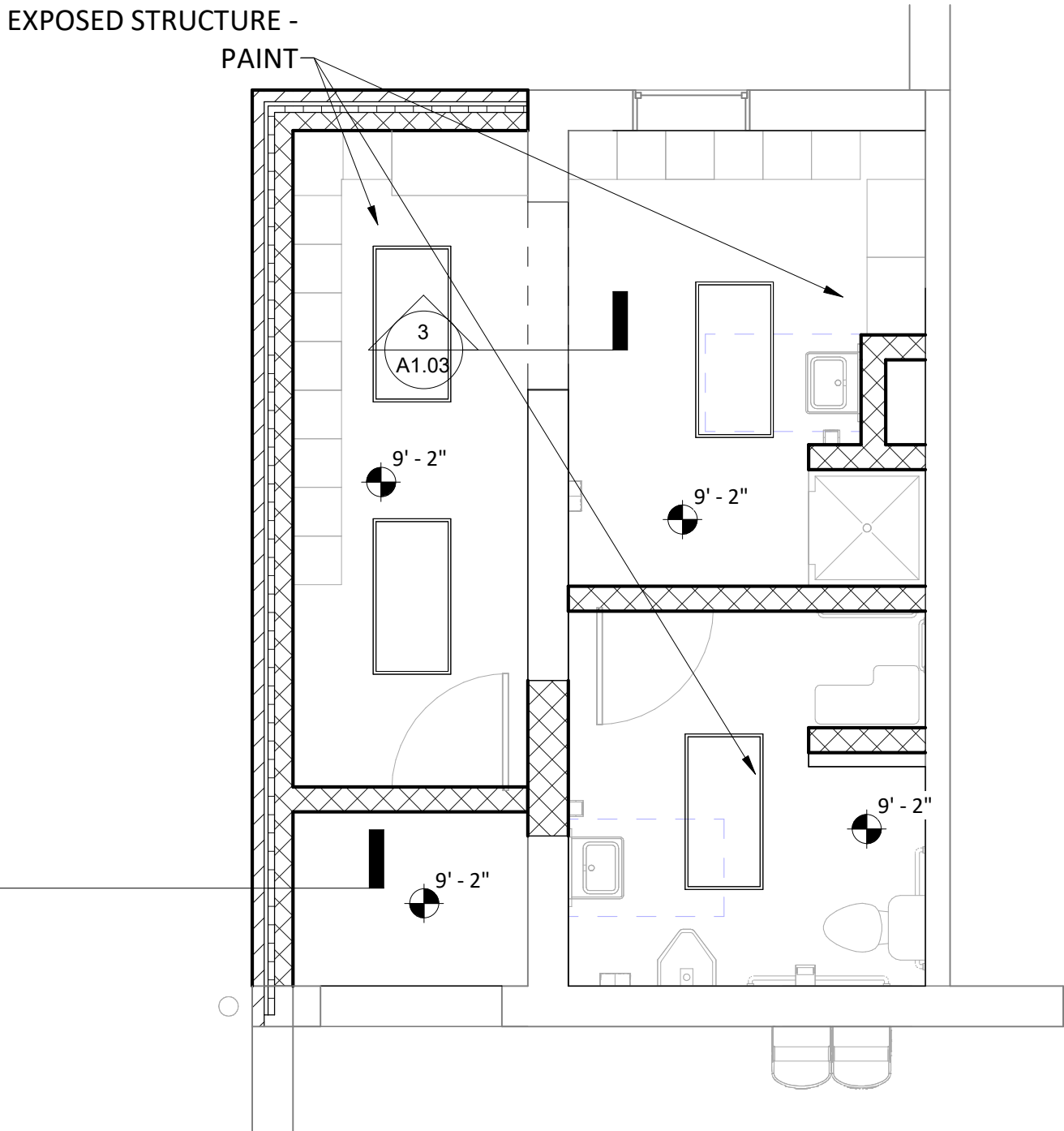
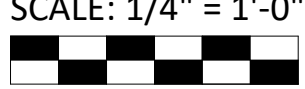
EPT2 MFG: SHERWIN WILLIAMS
COLOR: SW7068 GRIZZLE GRAY
(DOORS & DOOR FRAMES ONLY)

EPT3 MFG: SHERWIN WILLIAMS
COLOR: SW70007 CEILING BRIGHT
WHITE (CEILING PAINT)



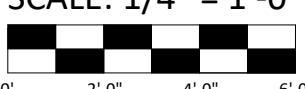
2 FIRST FLOOR ENLARGED LOCKER ROOM PLAN

SCALE: 1/4" = 1'-0"



4 FIRST FLOOR LOCKER ROOM ENLARGED CEILING PLAN

SCALE: 1/4" = 1'-0"



LOCKER ROOM DEMOLITION KEYNOTES

1	REMOVE ALL PLUMBING FIXTURES AND ACCESSORIES
2	REMOVE ALL LOCKERS, BENCHES, SHELVING, AND ANY OTHER ITEMS ATTACHED TO THE WALLS
3	REMOVE ALL TOILET PARTITIONS
4	SAWCUT AND REMOVE PORTION OF EXISTING MASONRY WALL FLUSH WITH SURROUNDING SLAB.
5	REMOVE WINDOW ASSEMBLY
6	REMOVE DOOR AND FRAME ASSEMBLY
7	REMOVE EXISTING DOWNSPOUT AND INTAKE. REROUTE TO WEST SIDE OF BUILDING.
8	REMOVE EXISTING WINDOW ASSEMBLY AND STONE SILL. PREPARE OPENING FOR MASONRY INFILL TO MATCH.

LOCKER ROOM KEYNOTES

1	PROVIDE HI/LO WATER FOUNTAIN
2	PROVIDE 20"x42" ADA BENCH
3	INSTALL GRAB BARS PER ADA STANDARDS
4	INSTALL SHOWER PER ADA STANDARDS
5	INSTALL SINK PER ADA STANDARDS
6	INFILL EXISTING OPENING WITH MASONRY TO MATCH EXISTING.
7	GRIND AND GROUT FILL CUT EDGES OF REMOVED WALL SECTION AS REQUIRED FOR NEW FINISHES.
8	PROVIDE NEW STAINLESS STEEL PLATING OVER CUT EDGE OF MASONRY OPENING

GENERAL DEMOLITION NOTES:

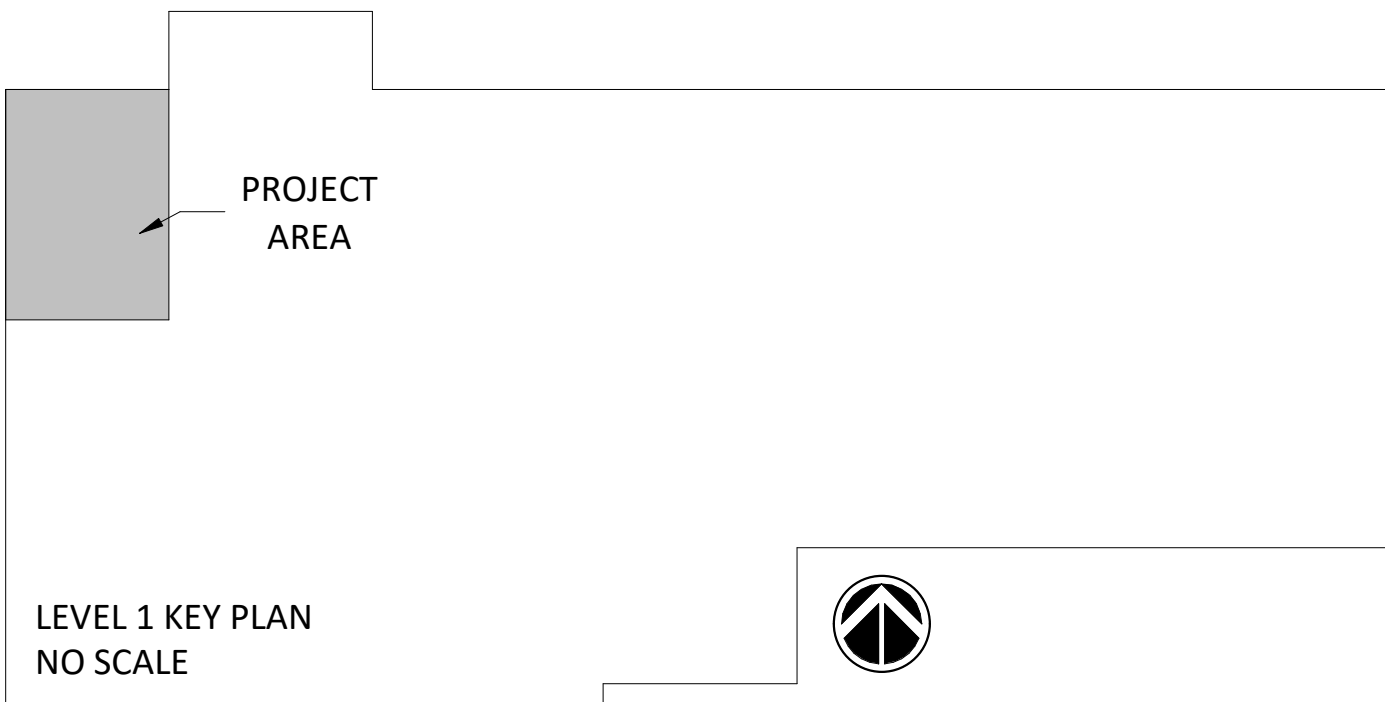
- REFERENCED DEMOLITION NOTES REFER TO THE MINIMUM AMOUNT OF DEMOLITION REQUIRED TO ACCOMMODATE THE NEW CONSTRUCTION. TRADE CONTRACTORS SHALL VISIT PROJECT SITE TO BECOME FAMILIAR WITH COMPLETE SCOPE OF REMOVAL/DEMOLITIONS AND FIELD VERIFY THE EXTENT OF DEMOLITION.
- EXISTING DIMENSIONS AND HATCHED AREAS ARE FOR GENERAL REFERENCE AND BIDDING PURPOSES ONLY. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD. THE ACTUAL AREA OF DEMOLITION SHOULD BE KEPT TO THE MINIMUM REQUIRED TO PROPERLY EXECUTE THE CONTRACT REQUIREMENTS.
- IN THE EVENT THAT AN EXISTING ITEM NOT SHOWN ON THE DRAWINGS CONFLICTS WITH WORK UNDER THIS CONTRACT, CONTACT THE ARCHITECT PRIOR TO REMOVAL OF THAT ITEM.
- ALL UTILITIES SHALL REMAIN IN SERVICE FOR OTHER OCCUPANCIES. ANY SHUTDOWNS OF BUILDING MUST BE APPROVED BY OWNER AND OCCUR AT OFF HOURS AS DEFINED BY OWNER.
- THE OWNER HAS FIRST RIGHT OF REFUSAL FOR ALL MATERIAL OR EQUIPMENT IDENTIFIED TO BE REMOVED. ALL ITEMS NOT TURNED OVER TO THE OWNER SHALL BE DISPOSED OF PROPERLY AND LAWFULLY.
- REFER TO DRAWINGS FOR LOCATIONS OF ALL ITEMS TO BE REINSTALLED. ALL ITEMS NOT SPECIFICALLY INDICATED FOR REINSTALLATION ON DRAWINGS ARE TO BE TURNED OVER TO THE OWNER. ALL ITEMS NOT TURNED OVER TO THE OWNER SHALL BE DISPOSED OF PROPERLY AND LAWFULLY.
- ALL REMOVED ITEMS IDENTIFIED FOR REINSTALLATION OR TO BE TURNED OVER TO THE OWNER SHALL BE PROTECTED UNTIL TIME OF REINSTALLATION OR OWNER POSSESSION. DAMAGED ITEMS SHALL BE REPAIRED OR REPLACED BY THE RESPONSIBLE TRADE CONTRACTOR.
- THROUGHOUT DEMOLITION AND CONSTRUCTION, PROTECT ITEMS SCHEDULED TO REMAIN AND/OR ALL ADJACENT MATERIALS AND EQUIPMENT, ETC. INDICATED TO REMAIN. COORDINATE REMOVAL AND PROTECTIONS WITH OWNER.
- COORDINATE WITH OWNER ACCESS AND LOCATIONS OF TEMPORARY PARTITION. TEMPORARY PARTITION MUST BE DUSTPROOF.
- AT REMOVAL OF SELECTED DEMOLITION ITEMS WHERE NO NEW CONSTRUCTION IS IDENTIFIED, PATCH, CLEAN, PREPARE, AND PAINT SURFACES TO MATCH FINISH COLOR, TEXTURE AND SHEEN OF ADJACENT SURFACES.
- AT ITEMS TO BE REMOVED, ALSO REMOVE ALL ASSOCIATED BRACKETS, SUPPORTS, FASTENERS, ANCHORS, ETC. PATCH, CLEAN, PREPARE, AND PAINT SURFACES TO MATCH FINISH COLOR, TEXTURE AND SHEEN OF ADJACENT SURFACES.
- PATCH ALL CEILINGS, WALLS AND FLOORS WHERE MECHANICAL, ELECTRICAL, TECHNOLOGY, PLUMBING AND FIRE PROTECTION COMPONENTS ARE TO BE REMOVED IN AN EXISTING CEILINGS, WALLS OR FLOORS TO REMAIN.
- ALL WALL DEMOLITION SHALL HAVE CLEAN, VERTICAL, SMOOTH CUTS. PATCH, REPLACE AND/OR FILL VOIDS IN WALLS TO REMAIN TO PROVIDE A SMOOTH SURFACE/EDGE FOR THE APPLICATION OF NEW FINISH MATERIAL.
- WHEN REMOVING EXISTING WALL TILE, FLOOR TILE, RUBBER BASE OR CEILING TILE, REMOVE FINISHES TO THE NEAREST JOINT WHICH ABUTS TILE NOT AFFECTED BY THE CONSTRUCTION. PROTECT THE SURFACES AND EDGES OF EXISTING FINISHES TO REMAIN.
- AT AREAS WHERE DEMOLITION OF THE FLOORING EXPOSES THE CONCRETE SUBSTRATE: COMPLETELY REMOVE THE MASTIC AND FILL ALL CRACKS AND SPALLED AREAS IN PREPARATION FOR NEW FLOORING MATERIAL. REMOVAL OF FLOORING MATERIAL INCLUDES REMOVAL OF ADJACENT WALL BASE MATERIAL.
- AT IDENTIFIED AREAS OF SPALLED, UNEVEN AND/OR SEPARATED CONCRETE SLABS: REMOVE ALL LOOSE MATERIAL: GRIND CONCRETE TO ACHIEVE A LEVEL SURFACE AND FILL CRACKS AND SPALLED AREAS IN PREPARATION FOR INSTALLATION OF FINISHED FLOORING.
- CONTRACTOR SHALL REMOVE EXISTING PLUMBING, MECHANICAL, ELECTRICAL OR OTHER MISCELLANEOUS ITEMS REQUIRED TO COMPLETE NEW WORK BUT NOT REQUIRED TO REMAIN.
- WHEN REMOVING INTERIOR OR EXTERIOR WALL ASSEMBLIES, CONTRACTOR SHALL ALSO REMOVE ALL ASSOCIATED POWER AND DATA RECEPTACLES, SWITCHES, ETC. REROUTE CONCEALED MEPPP WHERE REQUIRED TO MAINTAIN FUNCTIONING SYSTEMS; REMOVE ABANDONED MEPPP SYSTEMS TO SOURCE AND CAP APPROPRIATELY. REFER TO MECHANICAL, ELECTRICAL, TECHNOLOGY, LOW VOLTAGE, PLUMBING AND FIRE PROTECTION DRAWINGS FOR ADDITIONAL INFORMATION.
- CONTRACTOR SHALL REMOVE ALL DEBRIS AND TRASH RESULTING FROM CONSTRUCTION ON A DAILY BASIS.
- GENERAL CONTRACTOR SHALL RECYCLE DEMOLITION CONSTRUCTION DEBRIS IN ACCORDANCE WITH AUTHORITIES HAVING JURISDICTION AND SUSTAINABLE BEST PRACTICES.
- IN THE EVENT HAZARDOUS MATERIALS ARE UNCOVERED GENERAL CONTRACTOR IS TO NOTIFY THE OWNER AND THE APPROPRIATE AUTHORITIES. THE ARCHITECT IS NOT RESPONSIBLE FOR REMOVAL / ABATEMENT OF HAZARDOUS MATERIALS. CONTRACTOR TO PROVIDE REMOVAL / ABATEMENT AT LOCATIONS NECESSARY.
- REFER TO THE CIVIL, LANDSCAPE, STRUCTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION, ELECTRICAL, AND TECHNOLOGY DRAWINGS FOR THE DEMOLITION WORK SPECIFIC TO THOSE DISCIPLINES.
- STRUCTURAL ITEMS SHOWN AS "TO BE REMOVED" ARE FOR REFERENCE ONLY. VERIFY APPROPRIATE SHORING OR REINFORCEMENT CONDITION WITH STRUCTURAL DRAWINGS.

GENERAL NOTES:

- DIMENSIONS MUST BE VERIFIED IN THE FIELD ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE PROCEEDING WITH THE AFFECTED WORK.
- DO NOT SCALE THE DRAWINGS.
- THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH SITE CONDITIONS AS THEY MAY AFFECT CARRYING OUT THE WORK AS DESCRIBED IN THESE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INVESTIGATE, VERIFY, AND BE RESPONSIBLE FOR ALL CONDITIONS OF THE PROJECT AND NOTIFY THE ARCHITECT OF ANY CONDITIONS THAT REQUIRE MODIFICATION BEFORE PROCEEDING WITH THE WORK.
- THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, LABOR AND SERVICES NECESSARY TO COMPLETE THE WORK.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE BUILDING CODES AS ADOPTED BY THE CITY OF CLINTON.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL TRADES AND THE PRECENTION OF CONFLICT AMONG ALL TRADES.
- ARCHITECTURAL DRAWINGS MUST ALWAYS BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTS, ANY DISCREPANCY BETWEEN THESE DRAWINGS AND OTHER DOCUMENTS SHOULD BE REPORTED TO THE ARCHITECT FOR CLARIFICATION AND VERIFICATION PRIOR TO COMMENCEMENT OF AFFECTED WORK.
- PROVIDE SEALANT AT ALL JOINTS. CRACKS THAT OCCUR WHERE DISSIMILAR MATERIALS INTERSECT PERPENDICULAR TO EACH OTHER AND THE INTERSECTION IS EXPOSED TO VIEW, UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
- PAINT ALL EXPOSED STRUCTURE UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY BRACING AND SHORING REQUIRED DURING CONSTRUCTION.
- ALL WORK AND MATERIAL SHALL BE REGARDED AS NEW UNLESS SPECIFICALLY INDICATED AS "EXISTING" ON THE DRAWINGS.
- PORTABLE FIRE EXTINGUISHERS TO BE PROVIDED PER I.F.C. 906 AND/OR THE LOCAL AUTHORITY HAVING JURISDICTION. EXTINGUISHERS TO BE MAINTAINED BY THE OWNER.

REFLECTED CEILING PLAN NOTES:

- ALL CEILING ELEVATIONS IDENTIFIED DENOTE HEIGHT ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE.
- REFER TO MECHANICAL, PLUMBING, ELECTRICAL, FIRE PROTECTION, AND TECHNOLOGY DRAWINGS BY OTHERS FOR CEILING MOUNTED EQUIPMENT AND COMPONENTS NOT IDENTIFIED ON ARCHITECTURAL DRAWINGS.
- PRIOR TO BEGINNING ANY WORK, NOTIFY THE ARCHITECT IF EXISTING CONDITIONS PREVENT NEW CEILING SYSTEMS FROM BEING INSTALLED AS DRAWN AND NOTED.
- LIGHT FIXTURES ARE TO BE CENTERED IN THE WIDTH OF THE ROOMS WHEREVER POSSIBLE.



ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

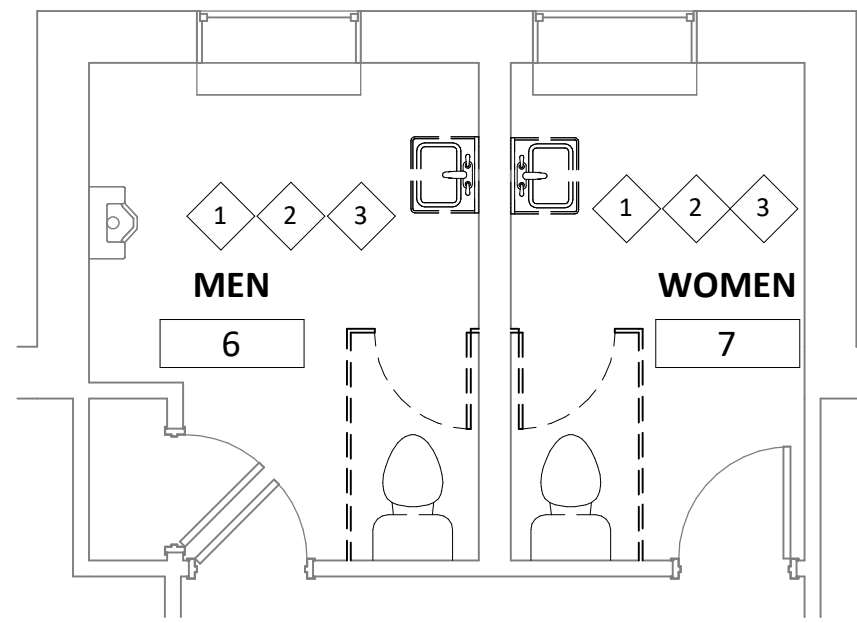
WILLET HOFMANN
& ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SURVEYING
625 32ND AVE SW CEDAR RAPIDS, IA 52404
1-319-378-1401

PHASE
☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

DATE
10/21/2024

SHEET
No.
A1.01



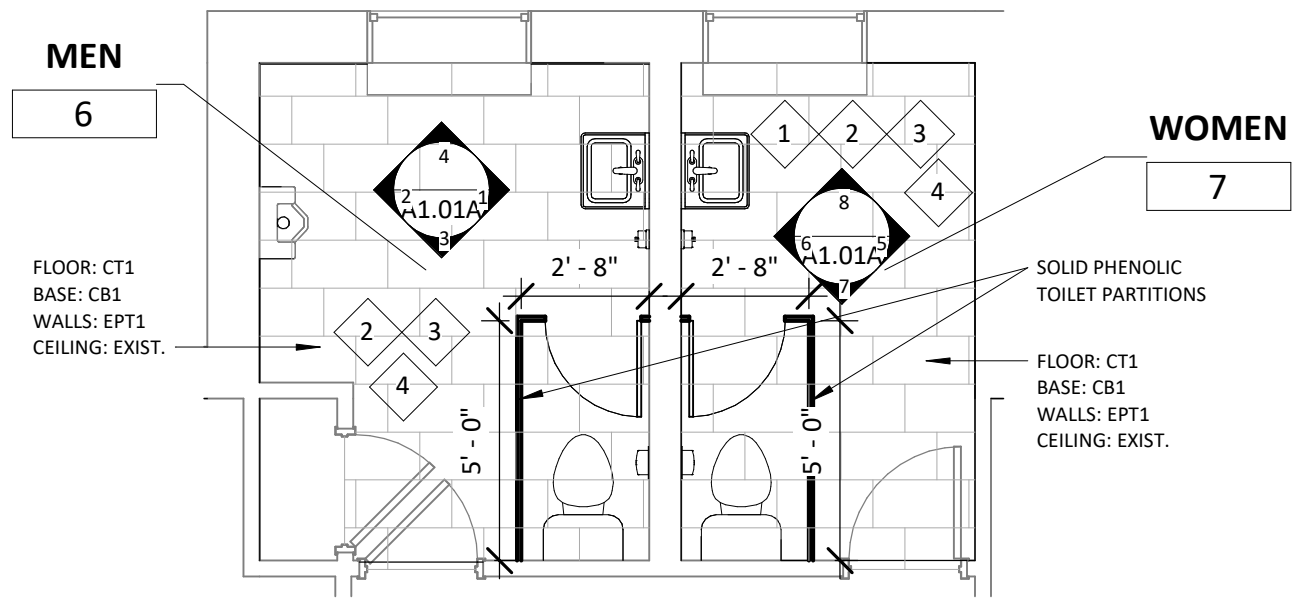
ENLARGED BATHROOM
DEMOLITION PLAN

2
A1.01A
SCALE: 1/4" = 1'-0"
0' 2'-0" 4'-0" 6'-0"



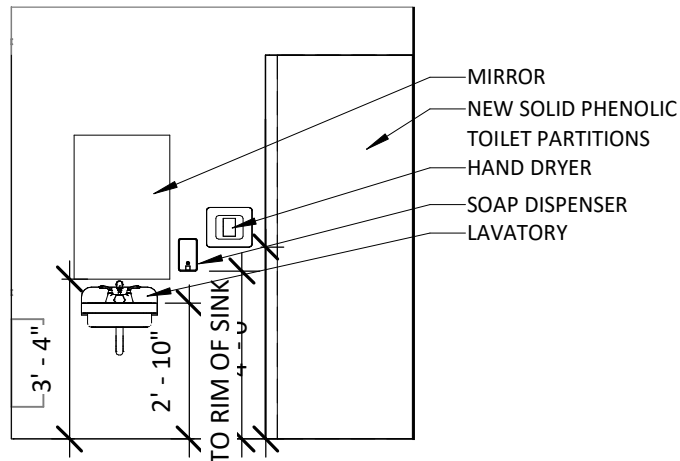
RESTROOM DEMOLITION KEYNOTES	
1	REMOVE ALL PLUMBING FIXTURES AND ACCESSORIES
2	REMOVE ALL TOILET PARTITIONS
3	REMOVE EXISTING TILE FLOOR. PATCH AND PREPARE SLAB FOR NEW TILE ...

RESTROOM KEYNOTES	
1	PROVIDE NEW PLUMBING FIXTURES IN PLACE OF EXISTING
2	PROVIDE NEW CERAMIC TILE FLOOR
3	PROVIDE NEW RESTROOM ACCESSORIES
4	CLEAN GROUT OF EXISTING GLAZED BLOCK WALLS, REGROUT AND SEAL



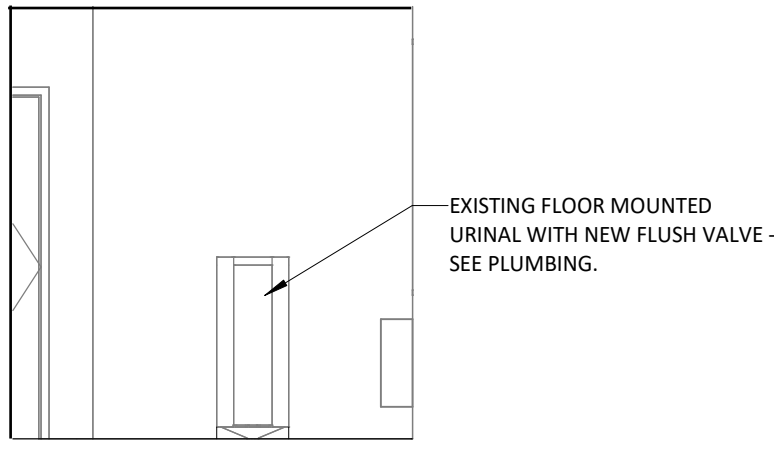
ENLARGED NEW WORK
RESTROOM PLAN

3
A1.01A
SCALE: 1/4" = 1'-0"
0' 2'-0" 4'-0" 6'-0"



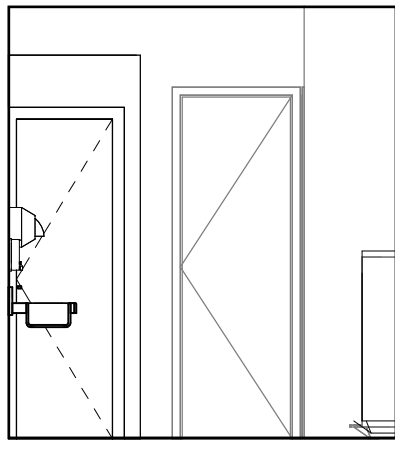
9 MENS BATHROOM NORTH

A1.01A
SCALE: 1/4" = 1'-0"
0' 2'-0" 4'-0" 6'-0"



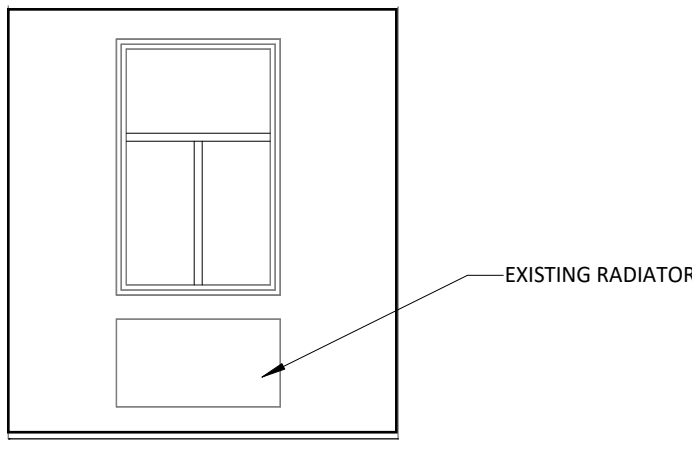
10 MENS BATHROOM SOUTH

A1.01A
SCALE: 1/4" = 1'-0"
0' 2'-0" 4'-0" 6'-0"



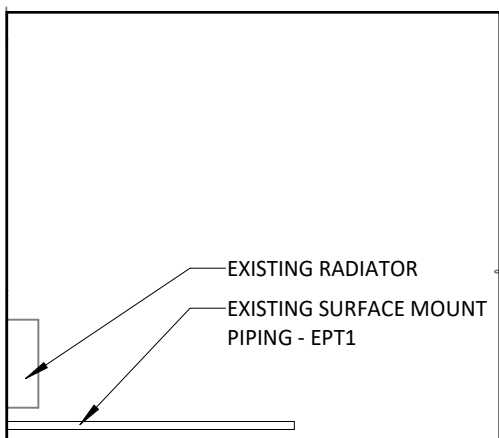
8 MENS BATHROOM EAST

A1.01A
SCALE: 1/4" = 1'-0"
0' 2'-0" 4'-0" 6'-0"



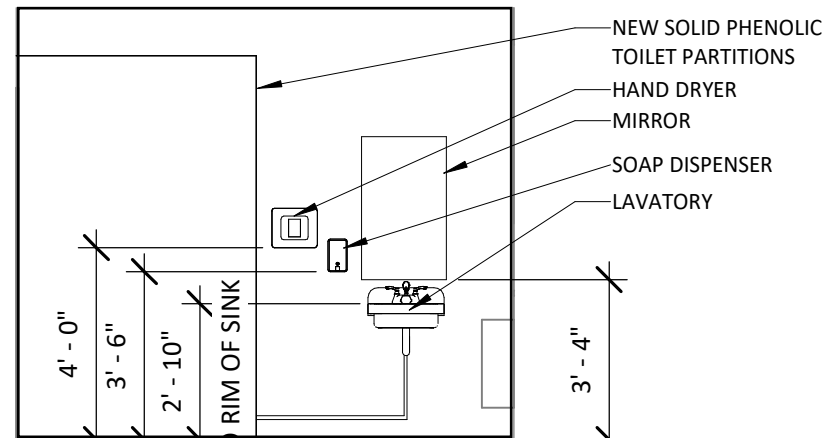
11 MENS BATHROOM WEST

A1.01A
SCALE: 1/4" = 1'-0"
0' 2'-0" 4'-0" 6'-0"



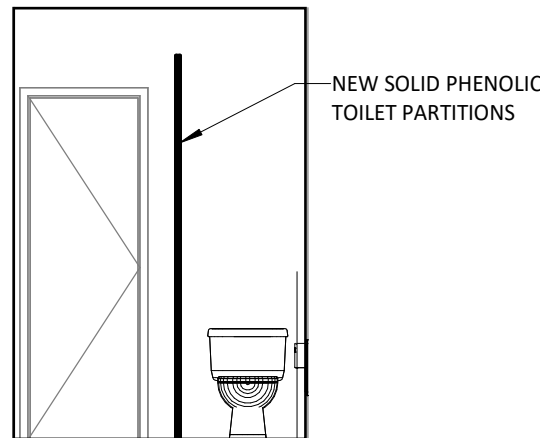
5 WOMENS BATHROOM
NORTH

A1.01A
SCALE: 1/4" = 1'-0"
0' 2'-0" 4'-0" 6'-0"



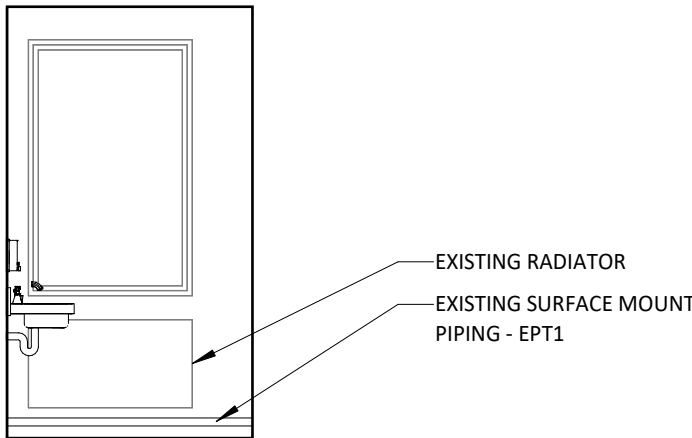
6 WOMENS BATHROOM
SOUTH

A1.01A
SCALE: 1/4" = 1'-0"
0' 2'-0" 4'-0" 6'-0"



1 WOMENS BATHROOM
EAST

A1.01A
SCALE: 1/4" = 1'-0"
0' 2'-0" 4'-0" 6'-0"



7 WOMENS BATHROOM
WEST

A1.01A
SCALE: 1/4" = 1'-0"
0' 2'-0" 4'-0" 6'-0"

FINISH SPECIFICATIONS

ALL FINISHES SHALL MEET ALL CLASS A FIRE RATINGS & COMPLY WITH CHAPTER 8 OF INTERNATIONAL BUILDING CODE.

CERAMIC TILE FLOORING

CT1 MFG: DAL TILE
TYPE: 12"x24" FIELD TILE,
3" BULLNOSE AT TOP OF WAINSCOT
PATTERN: STACKED BOND
COLOR: JET SETTER DUSK

WALL BASE

CB1 MFG: DAL TILE
TYPE: 3" BULLNOSE
COLOR: JET SETTER DUSK

SOLID PHENOLIC TOILET PARTITIONS

SP1 ASI GLOBAL PARTITIONS OR EQUAL
FLOOR ANCHORED SOLID COLOR PHENOLIC
COLOR: PASTEL GREY 3074

EPOXY PAINT

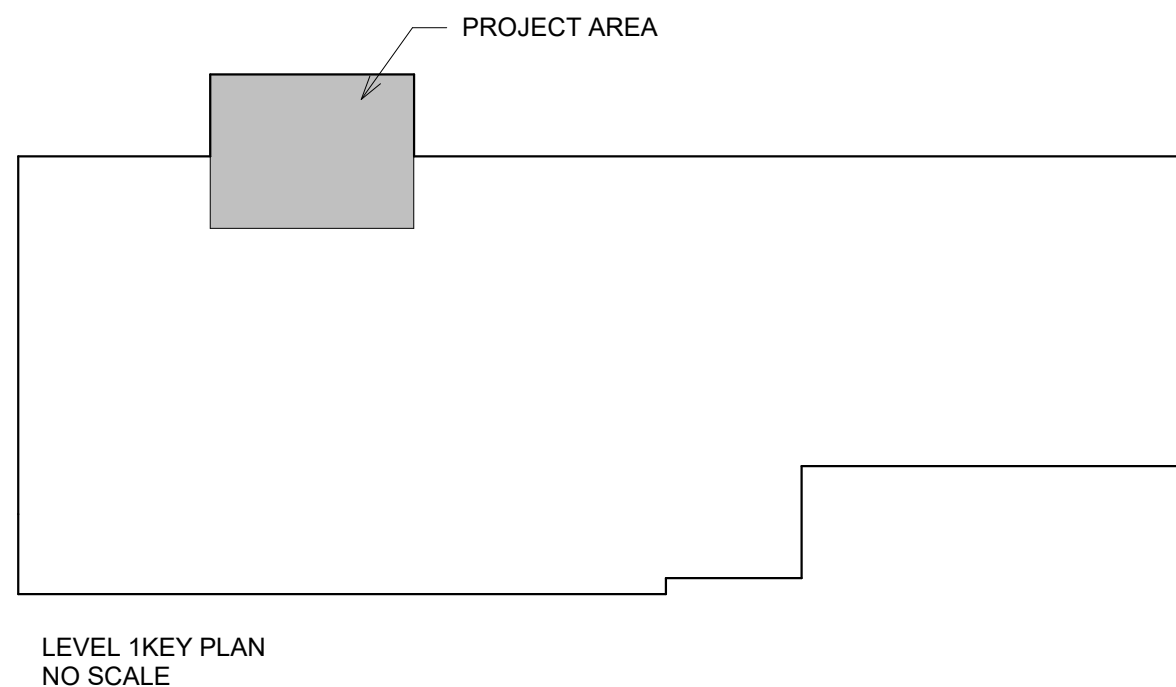
EPT1 MFG: SHERWIN WILLIAMS
COLOR: SNOWBOUND SW7004

GENERAL NOTES:

- DIMENSIONS MUST BE VERIFIED IN THE FIELD ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE PROCEEDING WITH THE AFFECTED WORK.
- DO NOT SCALE THE DRAWINGS.
- THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH SITE CONDITIONS AS THEY MAY AFFECT CARRYING OUT THE WORK AS DESCRIBED IN THESE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INVESTIGATE, VERIFY, AND BE RESPONSIBLE FOR ALL CONDITIONS OF THE PROJECT, AND NOTIFY THE ARCHITECT OF ANY CONDITIONS THAT REQUIRE MODIFICATION BEFORE PROCEEDING WITH THE WORK.
- THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, LABOR AND SERVICES NECESSARY TO COMPLETE THE WORK.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE BUILDING CODES AS ADOPTED BY THE CITY OF CLINTON.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL TRADES AND THE PRECENTION OF CONFLICT AMONG ALL TRADES.
- ARCHITECTURAL DRAWINGS MUST ALWAYS BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTS, ANY DISCREPANCY BETWEEN THESE DRAWINGS AND OTHER DOCUMENTS SHOULD BE REPORTED TO THE ARCHITECT FOR CLARIFICATION AND VERIFICATION PRIOR TO COMMENCEMENT OF AFFECTED WORK.
- PROVIDE SEALANT AT ALL JOINTS, CRACKS THAT OCCUR WHERE DISSIMILAR MATERIALS INTERSECT PERPENDICULAR TO EACH OTHER AND THE INTERSECTION IS EXPOSED TO VIEW, UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
- PAINT ALL EXPOSED STRUCTURE UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY BRACING AND SHORING REQUIRED DURING CONSTRUCTION.
- ALL WORK AND MATERIAL SHALL BE REGARDED AS NEW UNLESS SPECIFICALLY INDICATED AS 'EXISTING' ON THE DRAWINGS.
- PORTABLE FIRE EXTINGUISHERS TO BE PROVIDED PER I.F.C. 906 AND/OR THE LOCAL AUTHORITY HAVING JURISDICTION. EXTINGUISHERS TO BE MAINTAINED BY THE OWNER.

GENERAL DEMOLITION NOTES:

- REFERENCED DEMOLITION NOTES REFER TO THE MINIMUM AMOUNT OF DEMOLITION REQUIRED TO ACCOMMODATE THE NEW CONSTRUCTION. TRADE CONTRACTORS SHALL VISIT PROJECT SITE TO BECOME FAMILIAR WITH COMPLETE SCOPE OF REMOVALS/DEMOLITIONS AND FIELD VERIFY THE EXTENT OF DEMOLITION.
- EXISTING DIMENSIONS AND HATCHED AREAS ARE FOR GENERAL REFERENCE AND BIDDING PURPOSES ONLY. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD. THE ACTUAL AREA OF DEMOLITION SHOULD BE KEPT TO THE MINIMUM REQUIRED TO PROPERLY EXECUTE THE CONTRACT REQUIREMENTS.
- IN THE EVENT THAT AN EXISTING ITEM NOT SHOWN ON THE DRAWINGS CONFLICTS WITH WORK UNDER THIS CONTRACT, CONTACT THE ARCHITECT PRIOR TO REMOVAL OF THAT ITEM.
- ALL UTILITIES SHALL REMAIN IN SERVICE FOR OTHER OCCUPANCIES. ANY SHUTDOWNS OF BUILDING MUST BE APPROVED BY OWNER AND OCCUR AT OFF HOURS AS DEFINED BY OWNER.
- THE OWNER HAS FIRST RIGHT OF REFUSAL FOR ALL MATERIAL OR EQUIPMENT IDENTIFIED TO BE REMOVED.
- ALL ITEMS NOT TURNED OVER TO THE OWNER SHALL BE DISPOSED OF PROPERLY AND LAWFULLY. REFER TO DRAWINGS FOR LOCATIONS OF ALL ITEMS TO BE REINSTALLED. ALL ITEMS NOT SPECIFICALLY INDICATED FOR REINSTALLATION ON DRAWINGS ARE TO BE TURNED OVER TO THE OWNER. ALL ITEMS NOT TURNED OVER TO THE OWNER SHALL BE DISPOSED OF PROPERLY AND LAWFULLY.
- ALL REMOVED ITEMS IDENTIFIED FOR REINSTALLATION OR TO BE TURNED OVER TO THE OWNER SHALL BE PROTECTED UNTIL TIME OF REINSTALLATION OR OWNER POSSESSION. DAMAGED ITEMS SHALL BE REPAIRED OR REPLACED BY THE RESPONSIBLE TRADE CONTRACTOR.
- THROUGHOUT DEMOLITION AND CONSTRUCTION, PROTECT ITEMS SCHEDULED TO REMAIN AND/OR ALL ADJACENT MATERIALS AND EQUIPMENT, ETC. INDICATED TO REMAIN. COORDINATE REMOVAL AND PROTECTIONS WITH OWNER.
- COORDINATE WITH OWNER ACCESS AND LOCATIONS OF TEMPORARY PARTITION. TEMPORARY PARTITION MUST BE DUSTPROOF.
- AT REMOVAL OF SELECTED DEMOLITION ITEMS WHERE NO NEW CONSTRUCTION IS IDENTIFIED, PATCH, CLEAN, PREPARE, AND PAINT SURFACES TO MATCH FINISH COLOR, TEXTURE AND SHEEN OF ADJACENT SURFACES. AT ITEMS TO BE REMOVED, ALSO REMOVE ALL ASSOCIATED BRACKETS, SUPPORTS, FASTENERS, ANCHORS, ETC. PATCH, CLEAN, PREPARE, AND PAINT SURFACES TO MATCH FINISH COLOR, TEXTURE AND SHEEN OF ADJACENT SURFACES.
- PATCH ALL CEILINGS, WALLS AND FLOORS WHERE MECHANICAL, ELECTRICAL, TECHNOLOGY, PLUMBING AND FIRE PROTECTION COMPONENTS ARE TO BE REMOVED IN AN EXISTING CEILINGS, WALLS OR FLOORS TO REMAIN.
- ALL WALL DEMOLITION SHALL HAVE CLEAN, VERTICAL, SMOOTH CUTS. PATCH, REPLACE AND/OR FILL VOIDS IN WALLS TO REMAIN TO PROVIDE A SMOOTH SURFACE/EDGE FOR THE APPLICATION OF NEW FINISH MATERIAL.
- WHEN REMOVING EXISTING WALL TILE, FLOOR TILE, RUBBER BASE OR CEILING TILE, REMOVE FINISHES TO THE NEAREST JOINT WHICH ABUTS TILE NOT AFFECTED BY THE CONSTRUCTION. PROTECT THE SURFACES AND EDGES OF EXISTING FINISHES TO REMAIN.
- AT AREAS WHERE DEMOLITION OF THE FLOORING EXPOSES THE CONCRETE SUBSTRATE: COMPLETELY REMOVE THE MASTIC AND FILL ALL CRACKS AND SPALLED AREAS IN PREPARATION FOR NEW FLOORING MATERIAL. REMOVAL OF FLOORING MATERIAL INCLUDES REMOVAL OF ADJACENT WALL BASE MATERIAL.
- AT IDENTIFIED AREAS OF SPALLED, UNEVEN AND/OR SEPARATED CONCRETE SLABS: REMOVE ALL LOOSE MATERIAL, GRIND CONCRETE TO ACHIEVE A LEVEL SURFACE AND FILL CRACKS AND SPALLED AREAS IN PREPARATION FOR INSTALLATION OF FINISHED FLOORING.
- CONTRACTOR SHALL REMOVE EXISTING PLUMBING, MECHANICAL, ELECTRICAL OR OTHER MISCELLANEOUS ITEMS REQUIRED TO COMPLETE NEW WORK BUT NOT REQUIRED TO REMAIN.
- WHEN REMOVING INTERIOR OR EXTERIOR WALL ASSEMBLIES, CONTRACTOR SHALL ALSO REMOVE ALL ASSOCIATED POWER AND DATA RECEPTACLES, SWITCHES, ETC. REROUTE CONCEALED MEPPF WHERE REQUIRED TO MAINTAIN FUNCTIONING SYSTEMS; REMOVE ABANDONED MEPPF SYSTEMS TO SOURCE AND CAP APPROPRIATELY. REFER TO MECHANICAL, ELECTRICAL, TECHNOLOGY, LOW VOLTAGE, PLUMBING AND FIRE PROTECTION DRAWINGS FOR ADDITIONAL INFORMATION.
- CONTRACTOR SHALL REMOVE ALL DEBRIS AND TRASH RESULTING FROM CONSTRUCTION ON A DAILY BASIS. GENERAL CONTRACTOR SHALL RECYCLE DEMOLITION CONSTRUCTION DEBRIS IN ACCORDANCE WITH AUTHORITIES HAVING JURISDICTION AND SUSTAINABLE BEST PRACTICES.
- IN THE EVENT HAZARDOUS MATERIALS ARE UNCOVERED GENERAL CONTRACTOR IS TO NOTIFY THE OWNER AND THE APPROPRIATE AUTHORITIES. THE ARCHITECT IS NOT RESPONSIBLE FOR REMOVAL / ABATEMENT OF HAZARDOUS MATERIALS. CONTRACTOR TO PROVIDE REMOVAL / ABATEMENT AT LOCATIONS NECESSARY. REFER TO THE CIVIL, LANDSCAPE, STRUCTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION, ELECTRICAL, AND TECHNOLOGY DRAWINGS FOR THE DEMOLITION WORK SPECIFIC TO THOSE DISCIPLINES.



LEVEL 1 KEY PLAN
NO SCALE

- PHASE
- ☐ PRELIM
 - ☐ PERMIT
 - ☐ FINAL
 - ☒ BID
 - ☐ CONST

WHA No.
1854D23

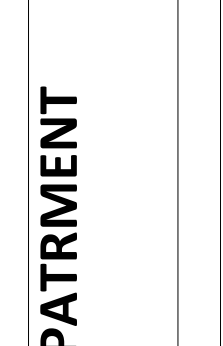
DATE
10/21/2024

SHEET
No.

A1.01A

ROCK ISLAND COUNTY HWY DEPARTRMENT
ADMIN BUILDING
8511 10th Ave W, Milan, IL 61264

WILLETT HOFMANN
& ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SURVEYING
603 32ND AVE SW CEDAR RAPIDS, IA 52404
1-319-378-1401

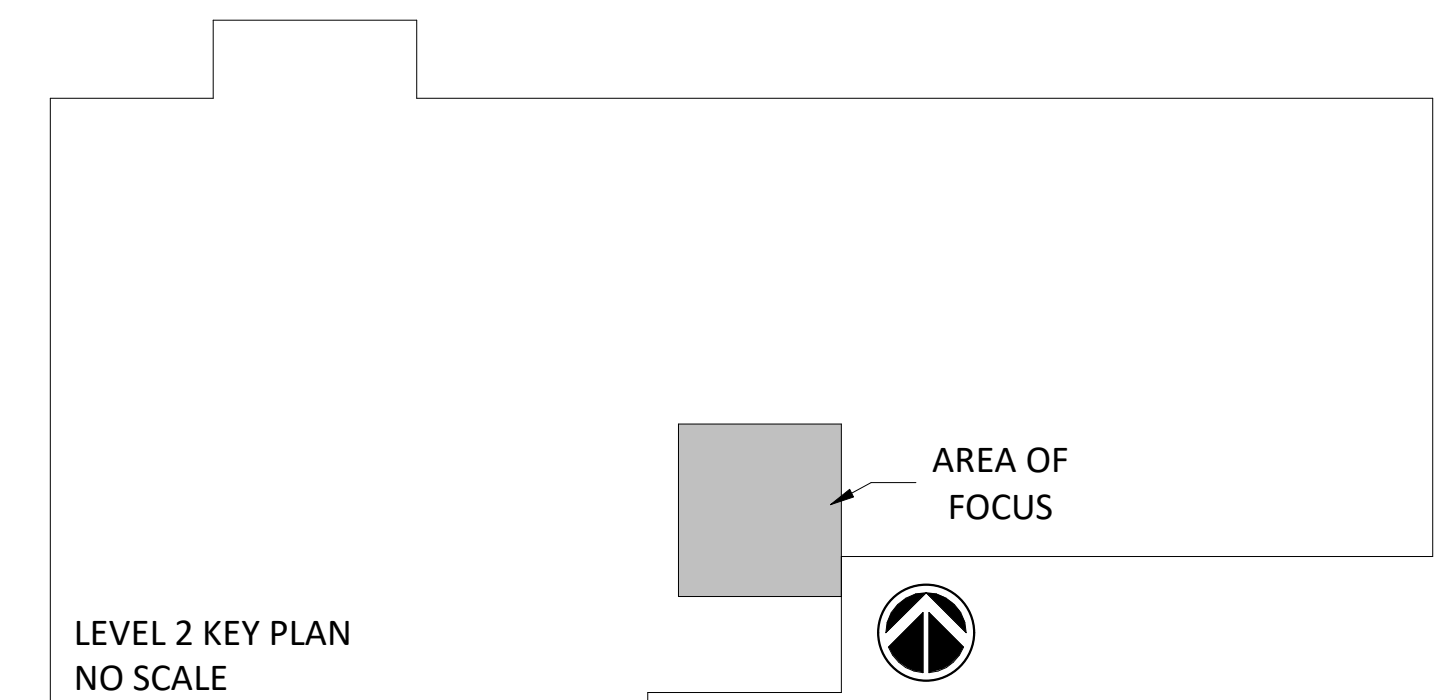
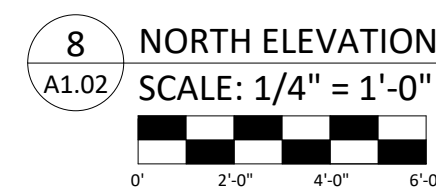
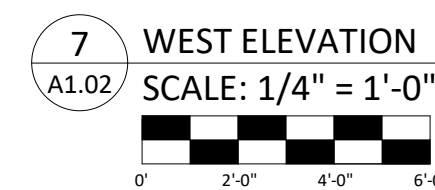
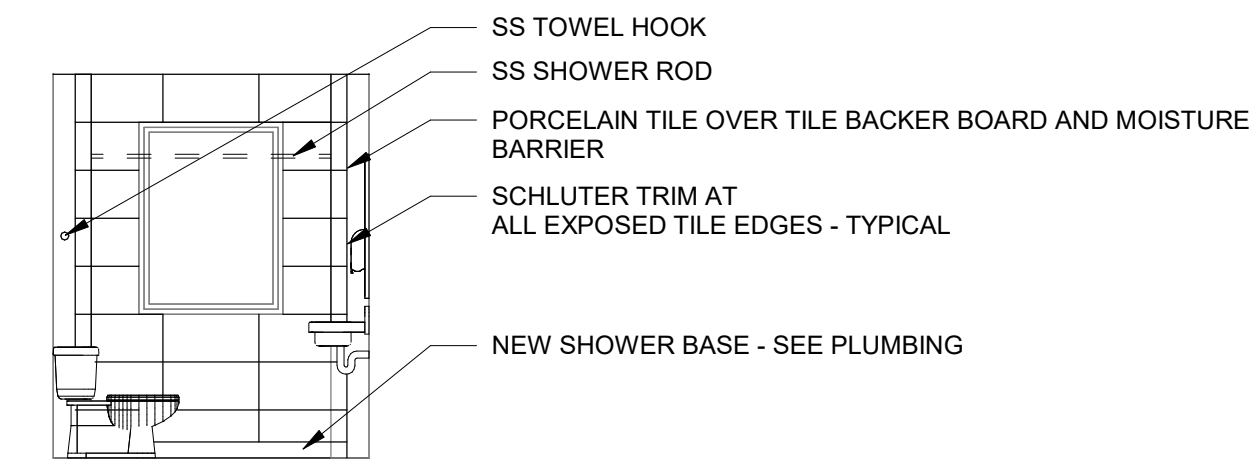
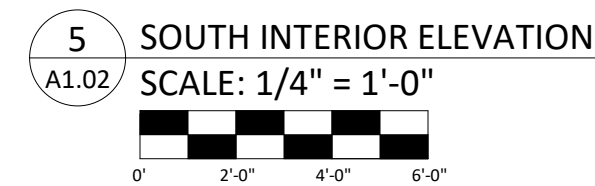
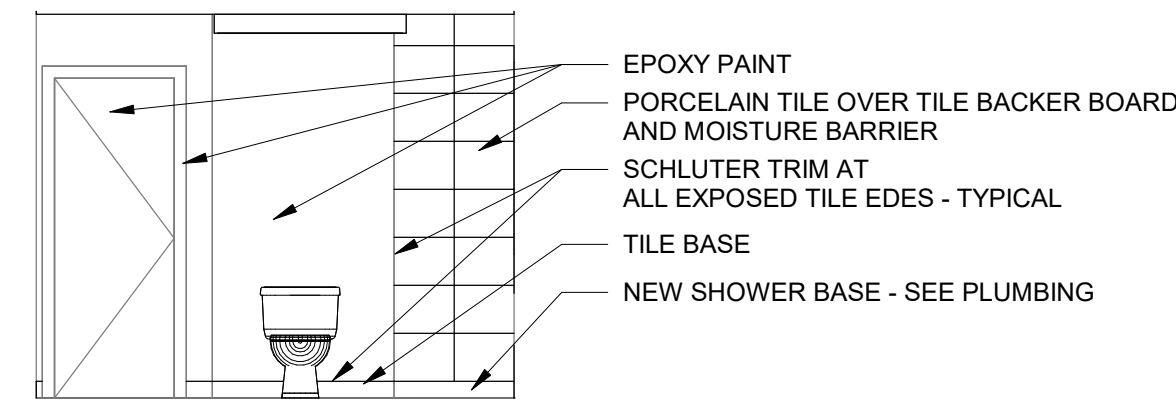
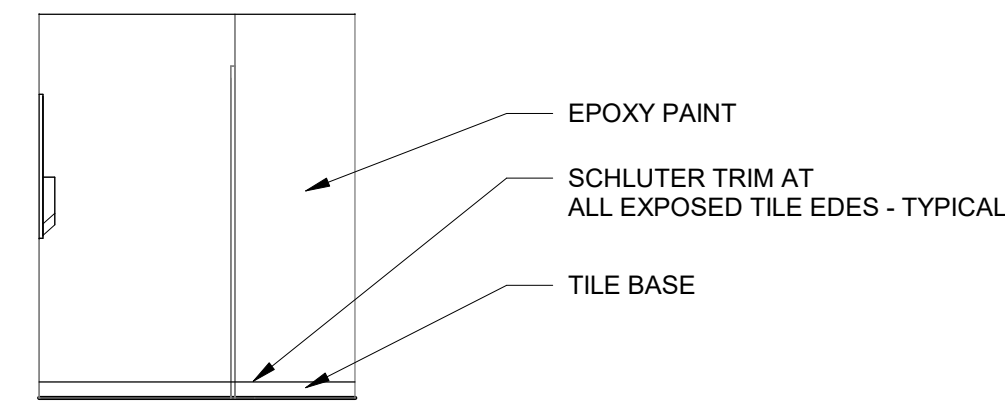
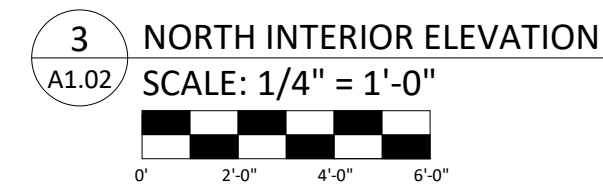
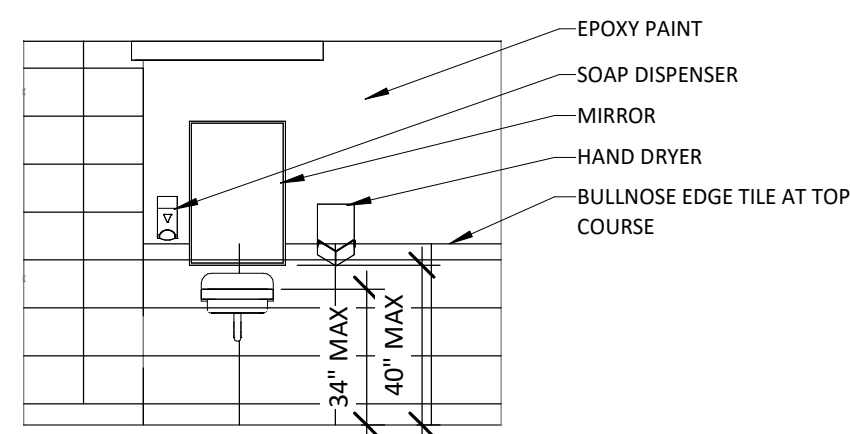
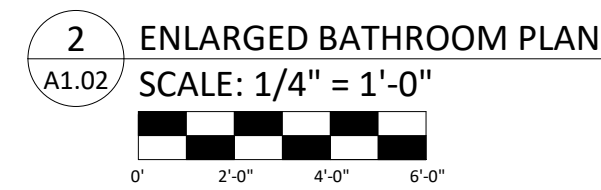
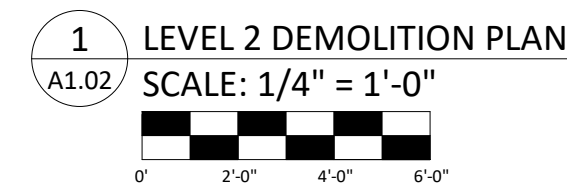


Willett, Hofmann & Associates, Inc.

FLOOR PLAN

© Copyright

This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission.



WILLET HOFMANN
& ASSOCIATES INC.
 ENGINEERING ARCHITECTURE LAND SURVEYING
 625 32ND AVE. SW, CEDAR RAPIDS, IA 52404
 T: 319-378-1401



851 10TH AVE W, MILAN, IL 61264

SECOND FLOOR PLAN

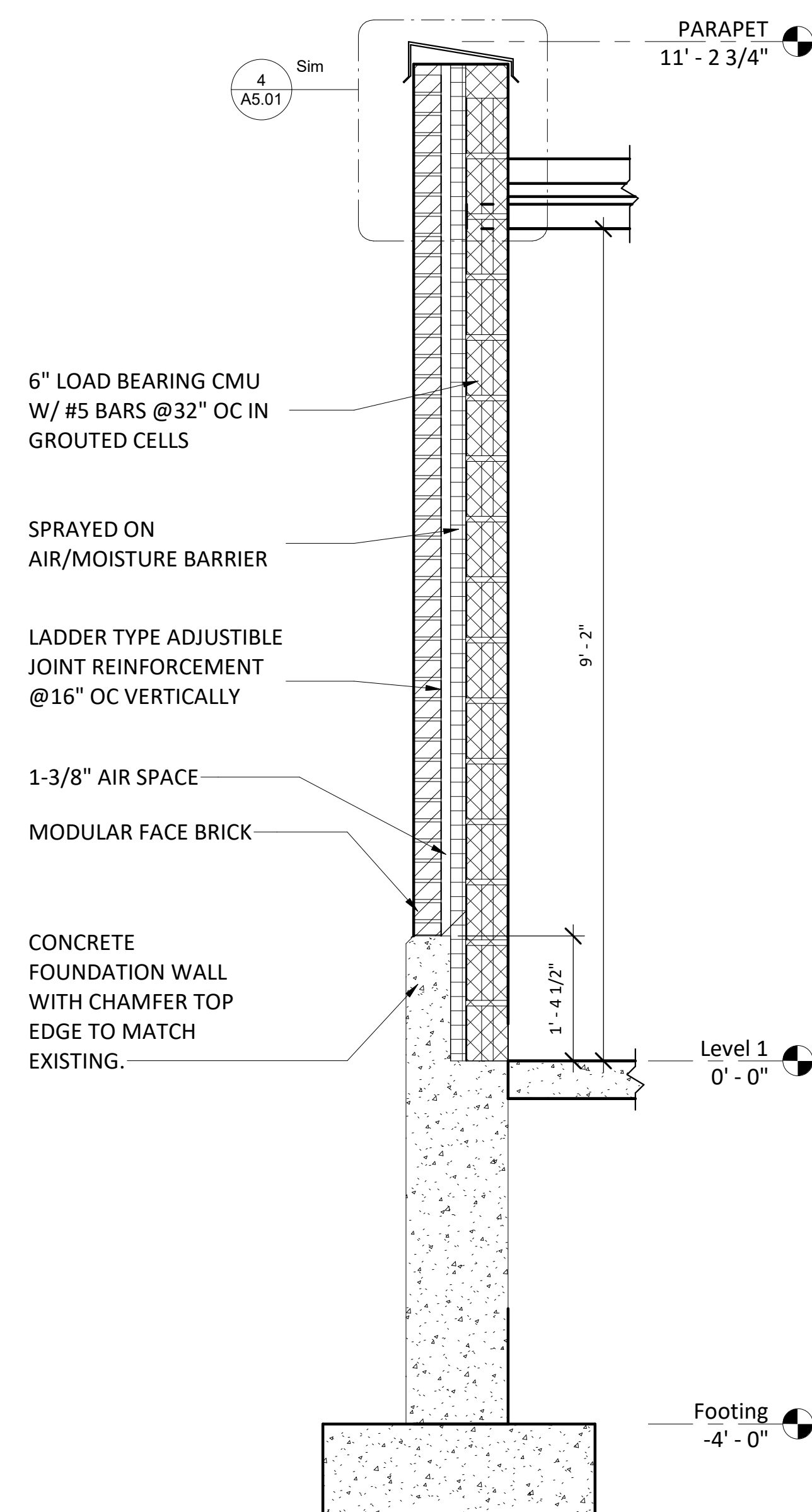
any person without written permission. © Copyright Willett

PHASE	
☐	PRELIM
☐	PERMIT
☐	FINAL
☒	BID
☐	CONST

WHA No.
1854D23

DATE
10/21/2024

SHEET
No.
A1.02

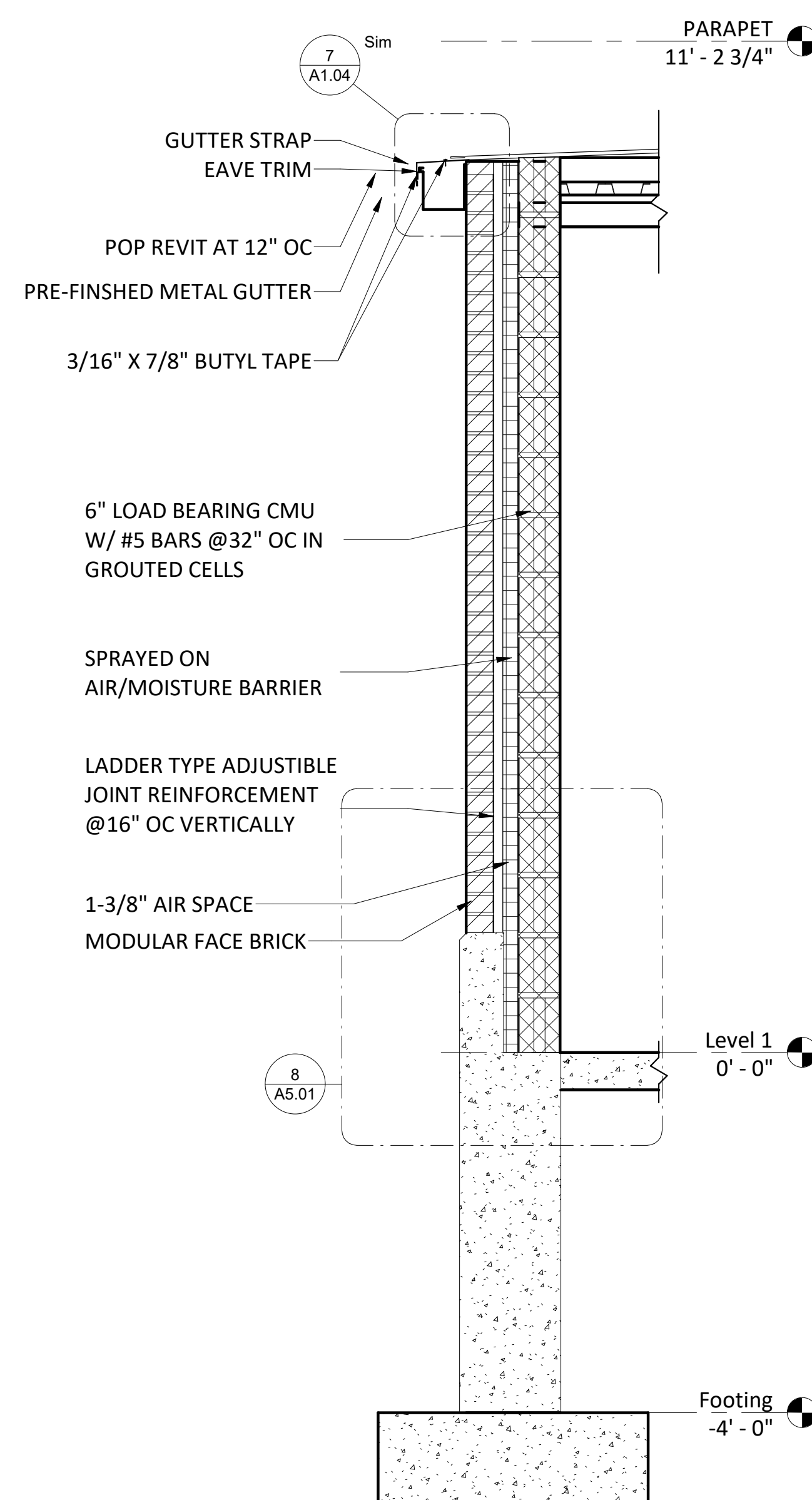


1
A1.03

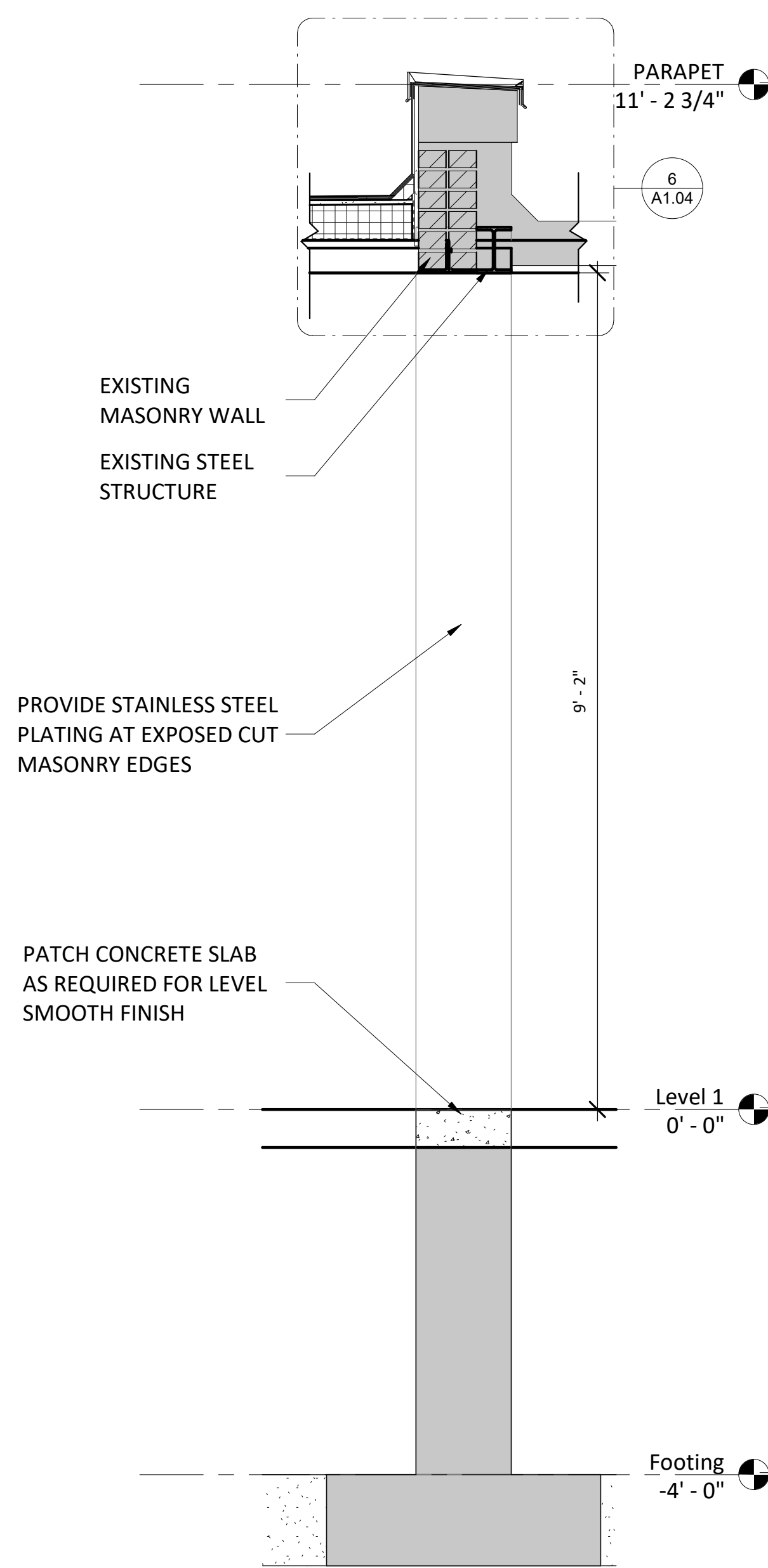
TYPICAL EXTERIOR WALL SECTION

SCALE: 3/4" = 1'-0"

0' 1'-0" 2'-0"



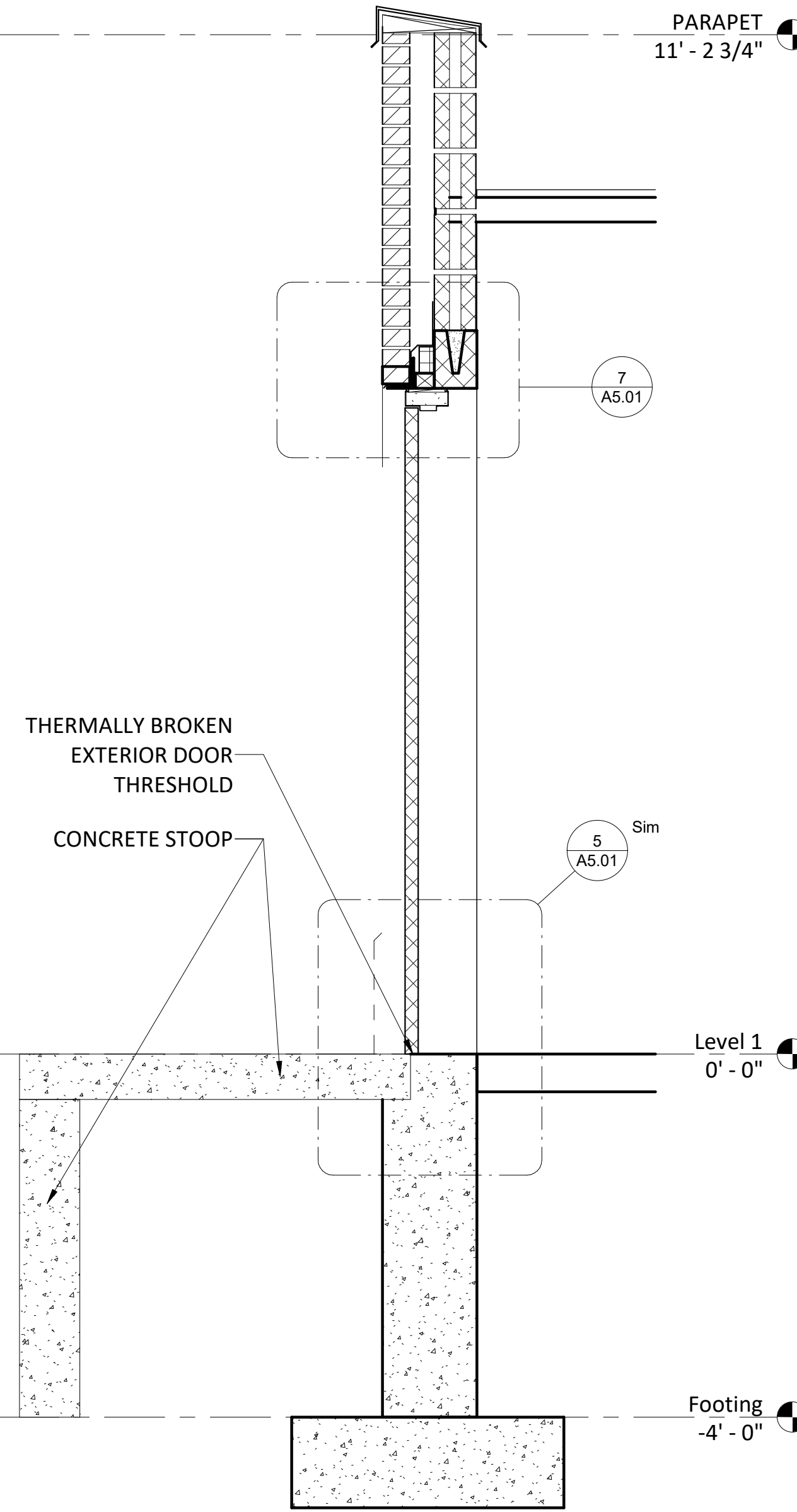
2 EXTERIOR WALL
A1.03 SCALE: $3/4" = 1'-0"$



3
A1.03

Section 1
SCALE: 3/4" = 1'-0"





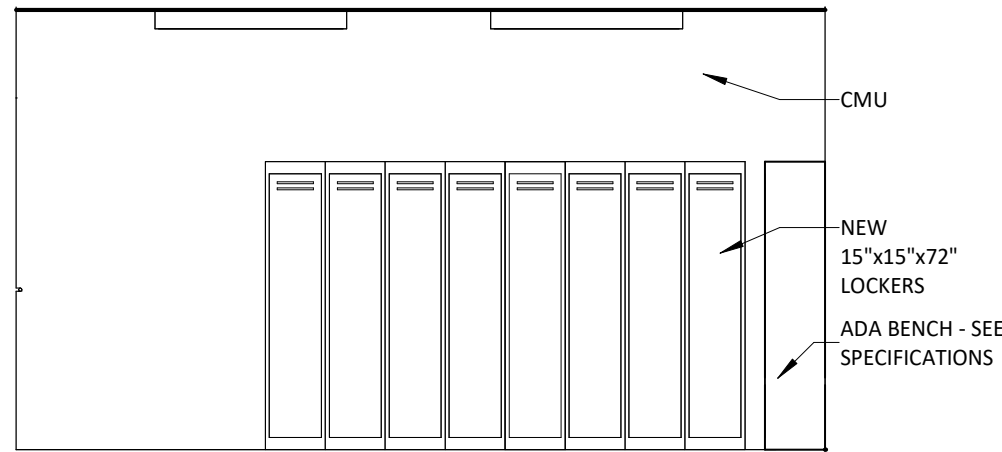
4
A1.03

EXTERIOR WALL SECTION AT
DOOR

SCALE: $3/4" = 1'-0"$

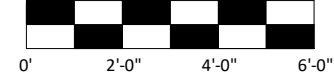


 WILLETTTS HOFMANN & ASSOCIATES INC. ENGINEERING ARCHITECTURE LAND SURVEYING 625 32ND AVE. SW. CEDAR RAPIDS, IA 52404 T. 319-378-1401			



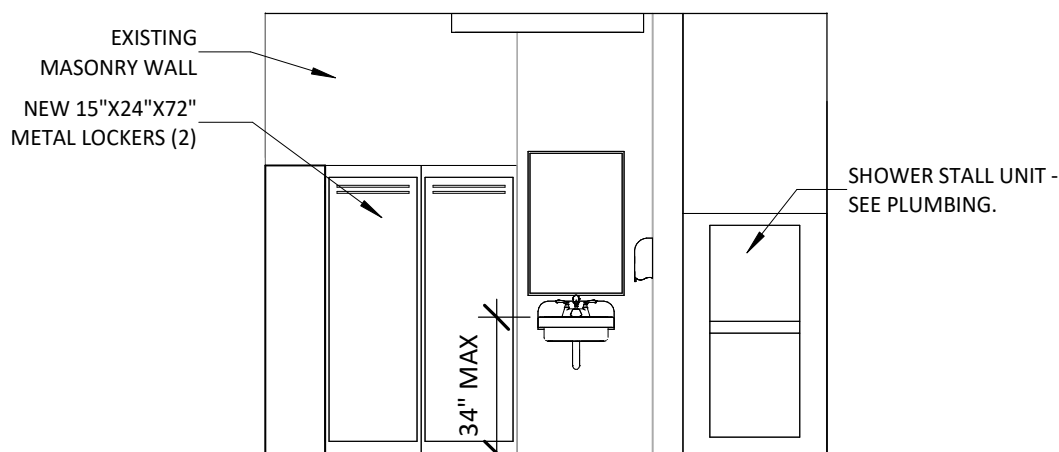
1 EAST LOCKER ROOM ELEVATION

A2.01 SCALE: 1/4" = 1'-0"



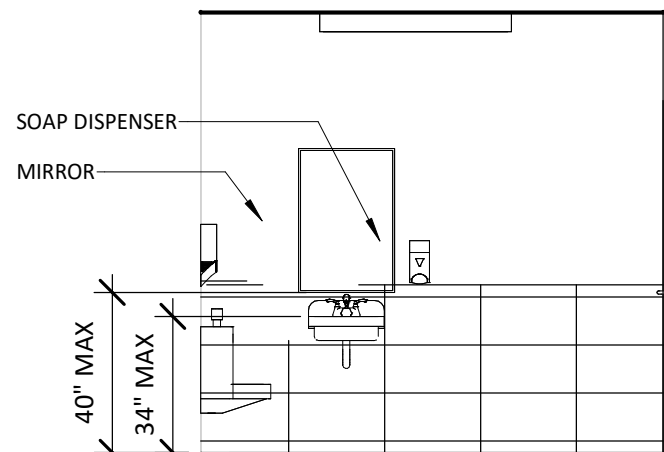
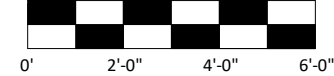
2 SOUTH LOCKER ROOM ELEVATION

A2.01 SCALE: 1/4" = 1'-0"



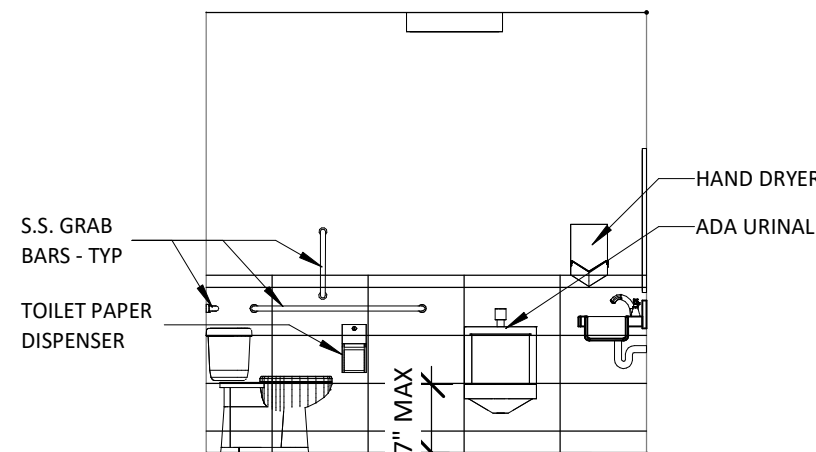
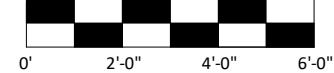
3 WEST LOCKER ROOM ELEVATION

A2.01 SCALE: 1/4" = 1'-0"



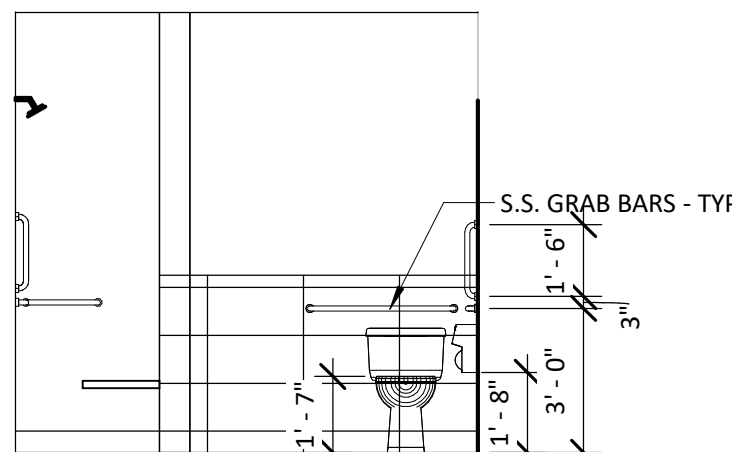
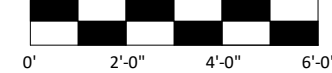
4 WEST BATHROOM ELEVATION

A2.01 SCALE: 1/4" = 1'-0"



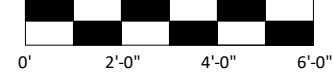
5 SOUTH BATHROOM ELEVATION

A2.01 SCALE: 1/4" = 1'-0"



6 EAST BATHROOM ELEVATION

A2.01 SCALE: 1/4" = 1'-0"



TYPICAL SIGNAGE



DOORS, FRAMES AND HARDWARE NOTES

- GENERAL:**
- ALL DOOR AND FRAME TYPES ARE SHOWN AS EXTERIOR VIEW.
 - FRAME WIDTHS ARE INDICATED ON THE FLOOR PLANS. FRAME HEIGHTS ARE INDICATED ON THE FRAME TYPES. DOOR DIMENSIONS ARE INDICATED ON THE DOOR AND FRAME SCHEDULE.
 - DIMENSIONS ARE INDICATED FOR BIDDING PURPOSES ONLY AND SHALL BE FIELD VERIFIED PRIOR TO PREPARATION OF SHOP DRAWINGS AND FABRICATION.
 - THE MANUFACTURER(S) SHALL BE RESPONSIBLE FOR THE ENGINEERING AND STRUCTURAL INTEGRITY OF THEIR FRAME SYSTEMS.
 - ALL FRAMES IN MASONRY OPENINGS REQUIRE A LINTEL. REFER TO DOOR AND FRAME SCHEDULE AND/OR STRUCTURAL DRAWINGS.
 - ALL OPENINGS IN FRAMES REQUIRE GLAZING PANELS OR INFILL PANELS EXCEPT FOR DOOR OPENINGS. GLAZING TYPES FOR EXTERIOR FRAMES ARE INDICATED ON THE FRAME TYPES. GLAZING TYPES FOR INTERIOR FRAMES ARE INDICATED ON THE DOOR AND FRAME SCHEDULE OR HEREIN.
 - ALL OPENINGS IN DOORS REQUIRE GLAZING PANELS UNLESS NOTED OTHERWISE. GLAZING TYPES FOR DOORS ARE INDICATED ON THE DOOR AND FRAME SCHEDULE OR HEREIN.
 - HARDWARE SETS AND GLAZING TYPES ARE SPECIFIED IN THE PROJECT MANUAL.
 - FRAMES SHALL BE DESIGNED, CUT, AND FABRICATED TO MINIMIZE JOINTS:
 - JOINTS IN HOLLOW METAL FRAMES SHALL RECEIVE METAL FILLER, BE GRIND SMOOTH AND SHOPFIELD PRIMED PRIOR TO FINISH PAINT.
 - JOINTS IN EXTERIOR ALUMINUM FRAMES SHALL BE AIR AND WATER TIGHT IN ACCORDANCE WITH THE REQUIREMENTS IDENTIFIED IN THE PROJECT MANUAL. LAP AND SEAL ALL JOINTS. ALLOW FOR EXPANSION IN THE TRIM AND AT JOINTS AND INTERSECTIONS OF ADJACENT FRAMES.
- HOLLOW METAL DOORS AND FRAMES:**
- ALL HOLLOW METAL FRAMES SHALL HAVE THE FOLLOWING CHARACTERISTICS UNO:
 - FACE WIDTH: 2"
 - FRAME DEPTH: 5-3/4" UNO
 - THROAT: 4-7/8"
 - RETURN: 7/16"
 - ANCHORAGE AT HOLLOW METAL FRAMES:
 - PROVIDE FASTENERS AT 18" ON CENTER AND MINIMALLY THREE (3) ANCHORS PER JAMB.
 - AT FRAMES INSTALLED PRIOR TO MASONRY INSTALLATION PROVIDE GALVANIZED STEEL "T" ANCHORS.
 - AT FRAMES INSTALLED AFTER MASONRY INSTALLATION OR AT EXISTING MASONRY OPENINGS PROVIDE GALVANIZED STEEL SPACER BRACKETS, ANCHOR SLEEVES WELDED TO THE INTERIOR OF THE FRAME, AND COUNTERSUNK 3/8" FLATHEAD EXPANSION ANCHORS. COVER HEAD OF FASTENERS WITH METAL FILLER, GRIND SMOOTH, PRIME AND FINISH PAINT.
 - JAMBS OF FRAMES INSTALLED IN EXTERIOR WALLS AND WHERE INDICATED SHALL BE GROUTED SOLID. COVER GROUT HOLES WITH METAL FILLER, GRIND SMOOTH, PRIME AND FINISH PAINT.

DOOR HARDWARE SETS

DOOR HARDWARE TO BE US-26 OR US-32D FINISH.

HARDWARE SET 1 - EXTERIOR HM DOOR (SINGLE)

- 3 - HEAVY WEIGHT MORTISE HINGES
1 - MORTISE LOCK EXIT DEVICE WITH LEVER TRIM
1 - SURFACE MOUNTED DOOR CLOSER WITH STOP ARMS
1 - THRESHOLD
1 - WEATHERSTRIPPING
1 - DOOR SWEEPS
1 - DRIP CAP

HARDWARE SET 2 - INTERIOR HM DOOR (SINGLE)

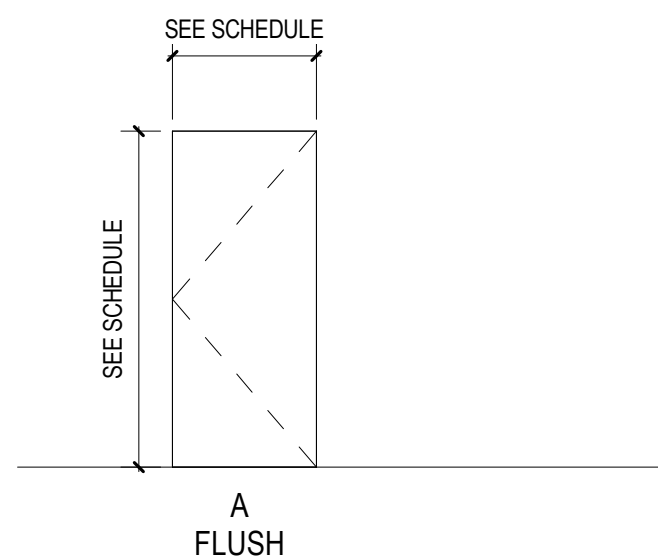
- 3 - HEAVY WEIGHT MORTISE HINGES
1 - PUSH/PULL
1 - SURFACE MOUNTED DOOR CLOSER WITH STOP ARMS

HARDWARE SET 3 - INTERIOR HM DOOR (SINGLE)

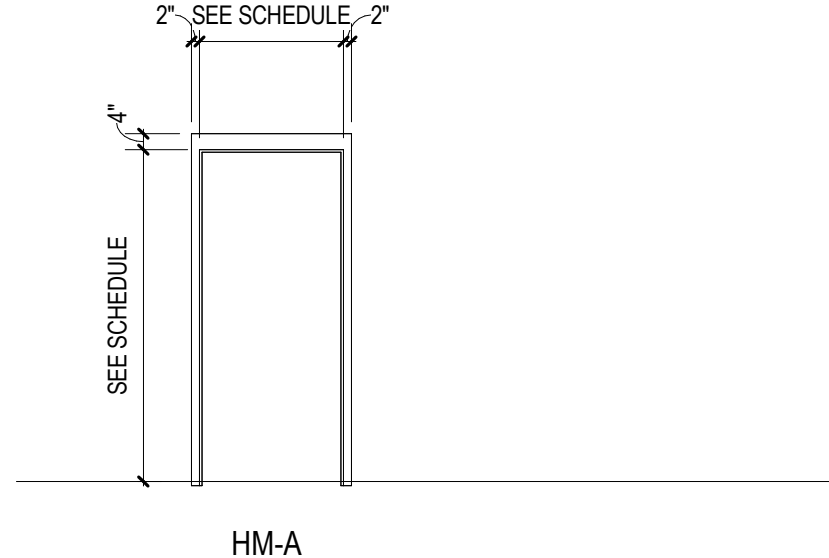
- 3 - HEAVY WEIGHT MORTISE HINGES
1 - LEVER STYLE PRIVACY LOCKSET W/ INDICATOR
1 - SURFACE MOUNTED DOOR CLOSER WITH STOP ARMS

DOOR SCHEDULE

MARK	WIDTH	HEIGHT	DOOR TYPE	MATERIAL	FINISH	FRAME TYPE	FRAME MATERIAL	FRAME FINISH	HARDWARE GROUP	REMARKS
101	3'-0"	7'-0"	A	HM	PT	HM-A	HM	PT	SET 1	
102	3'-0"	7'-0"	A	HM	PT	HM-A	HM	PT	SET 2	
103	3'-0"	7'-0"	A	HM	PT	HM-A	HM	PT	SET 3	



DOOR TYPES SCALE



FRAME TYPES SCALE

PHASE

- ☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

DATE
10/21/2024

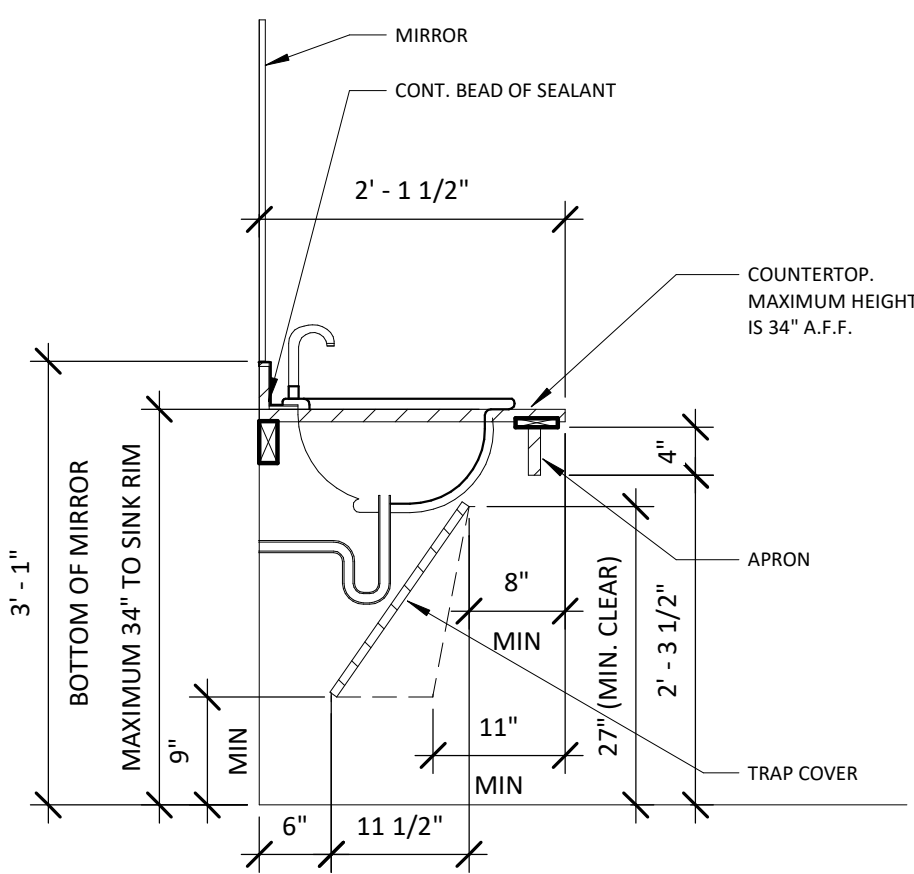
SHEET No.
A2.01

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

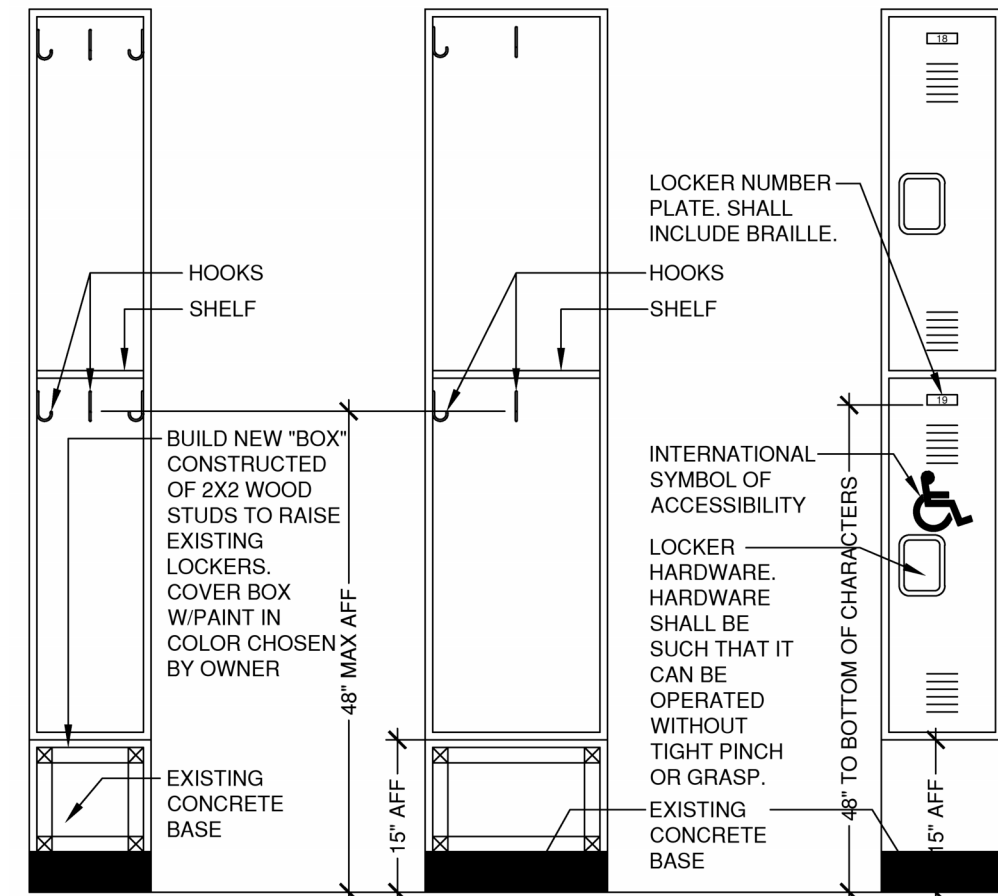
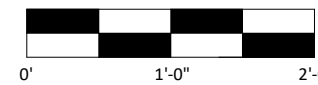
INTERIOR ELEVATIONS

WILLETT HOFMANN & ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SURVEYING
625 32ND AVE SW CEDAR RAPIDS, IA 52404
1-319-378-1401

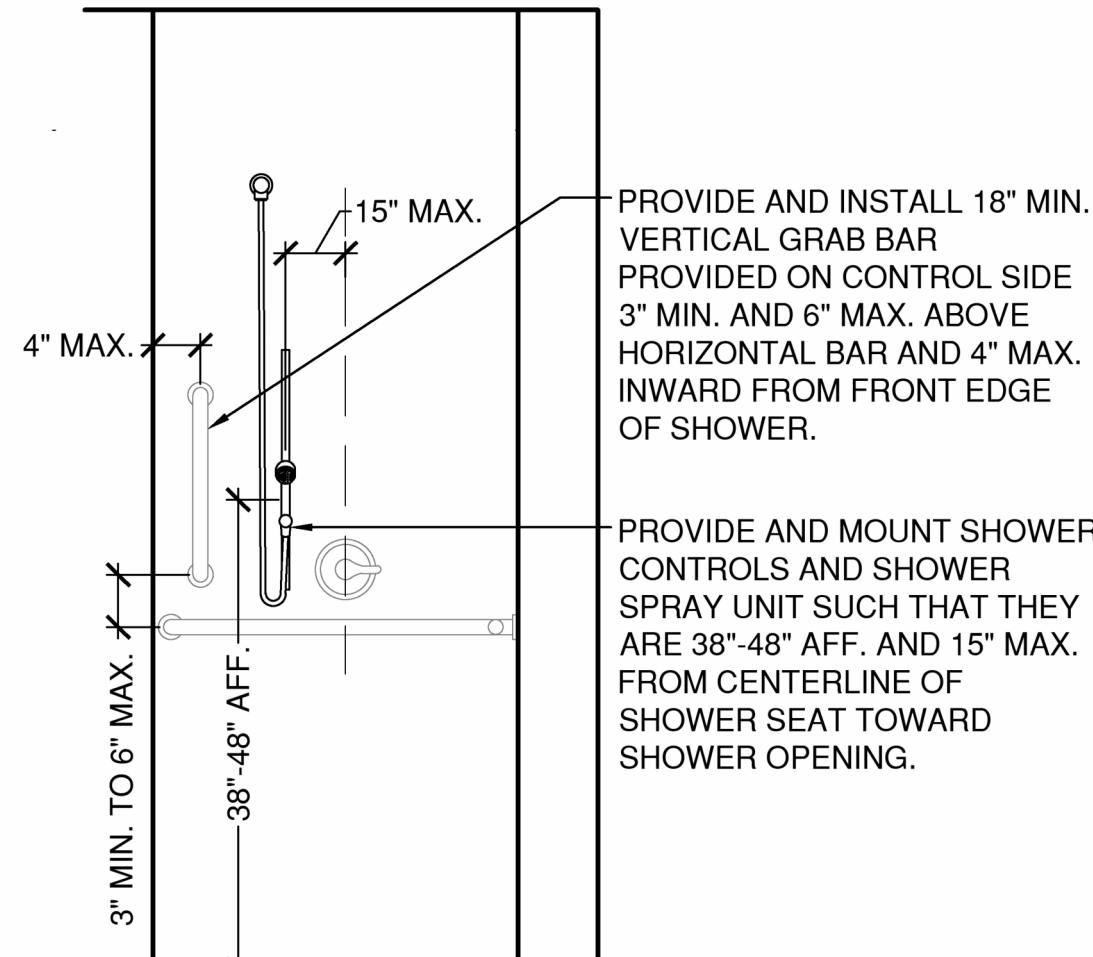
This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hofmann & Associates, Inc.



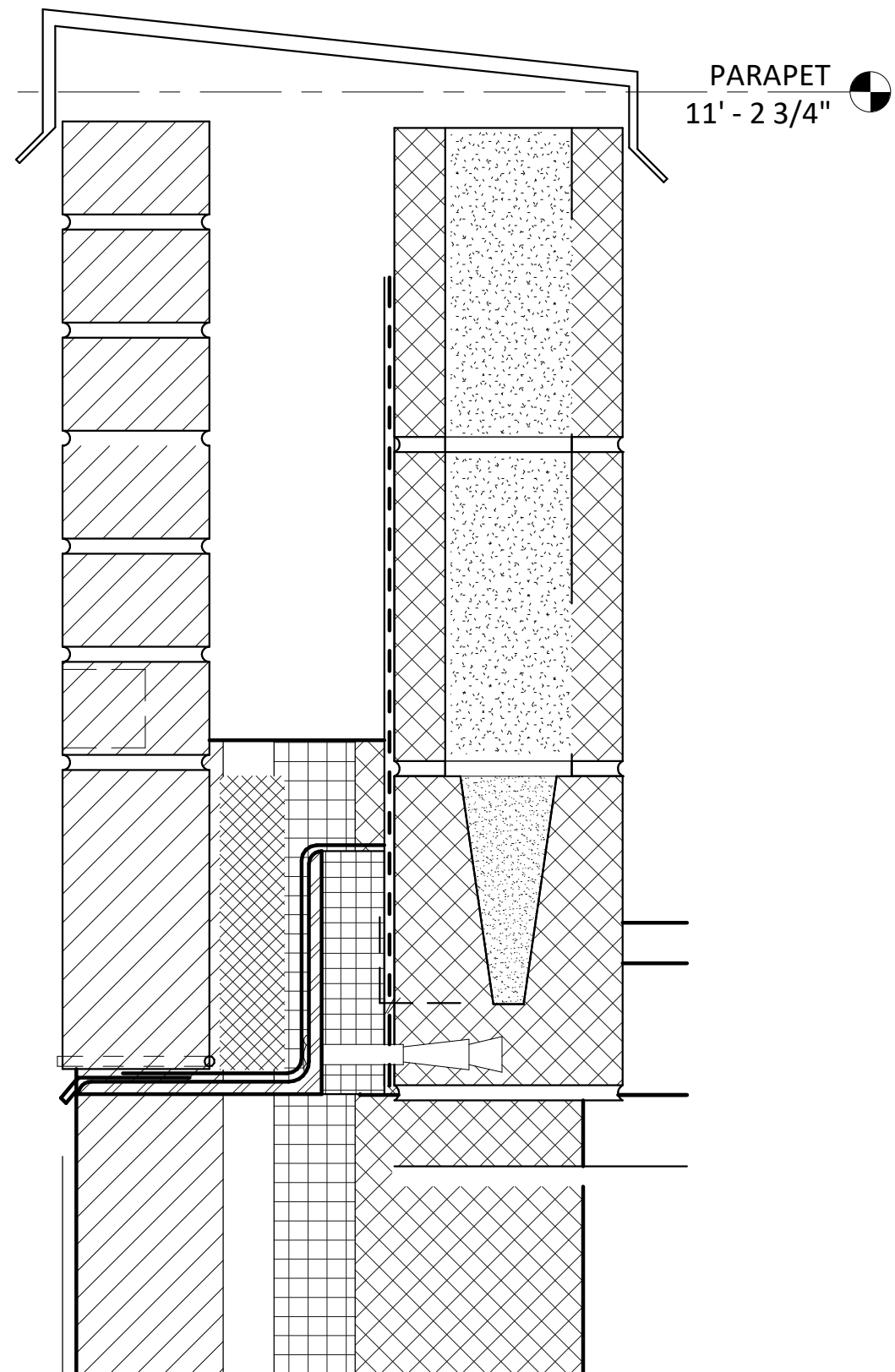
1 ADA VANITY
SCALE: 3/4" = 1'-0"



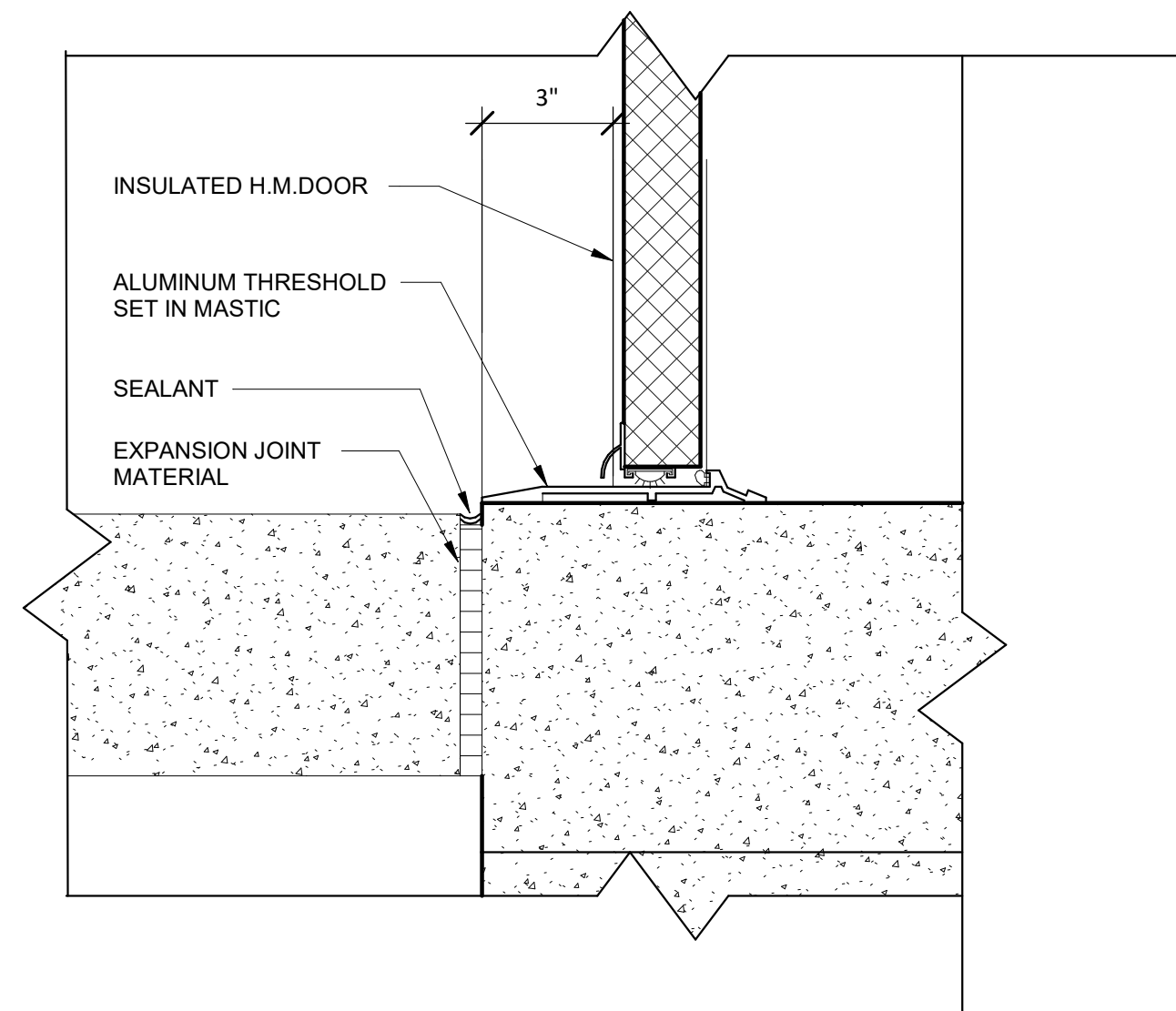
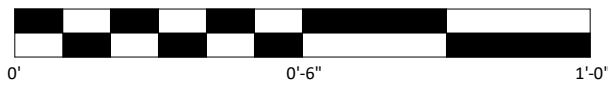
2 ADA LOCKERS
NO SCALE



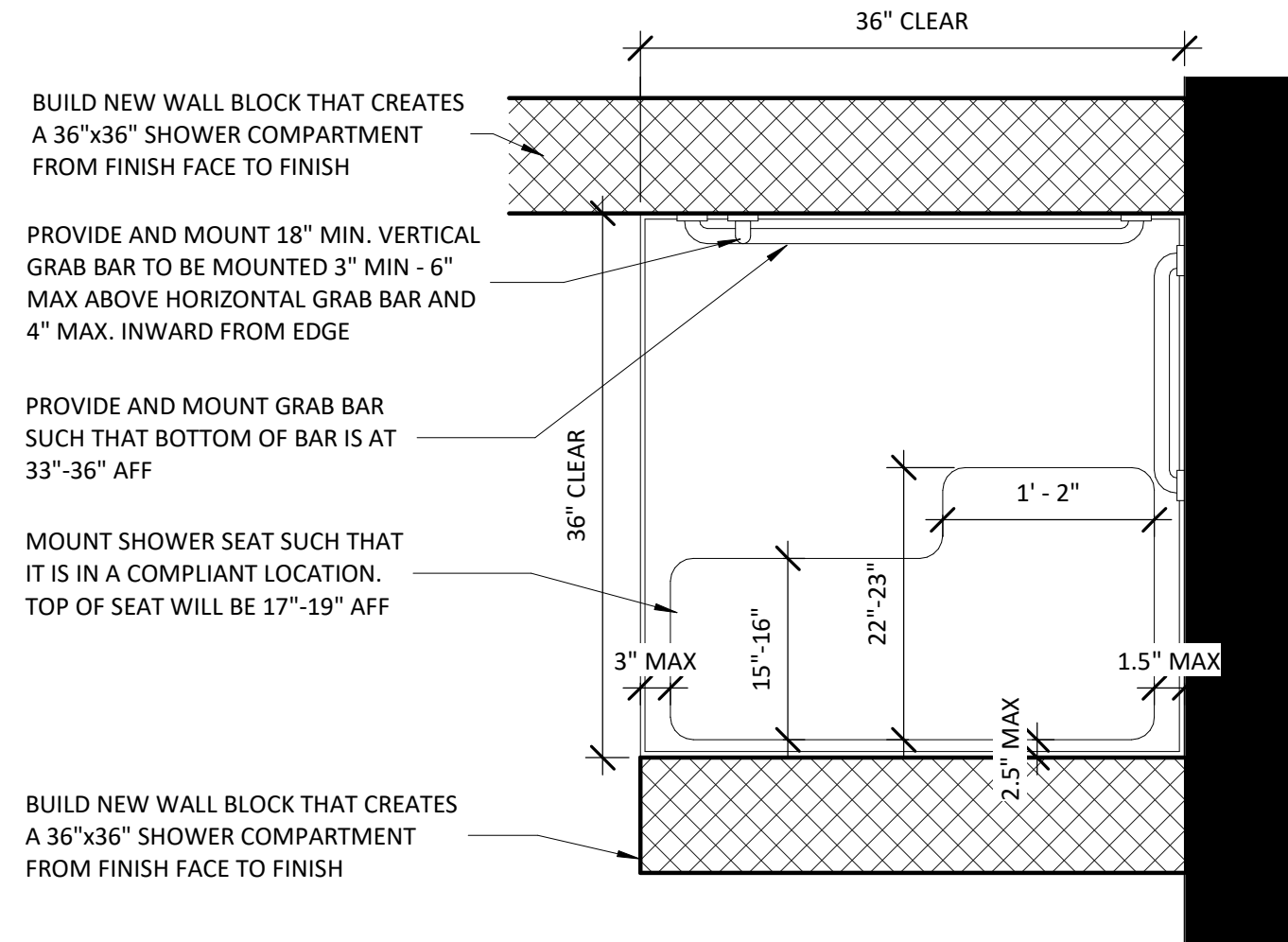
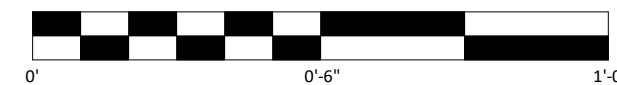
3 ADA SHOWER ELEVATION
NO SCALE



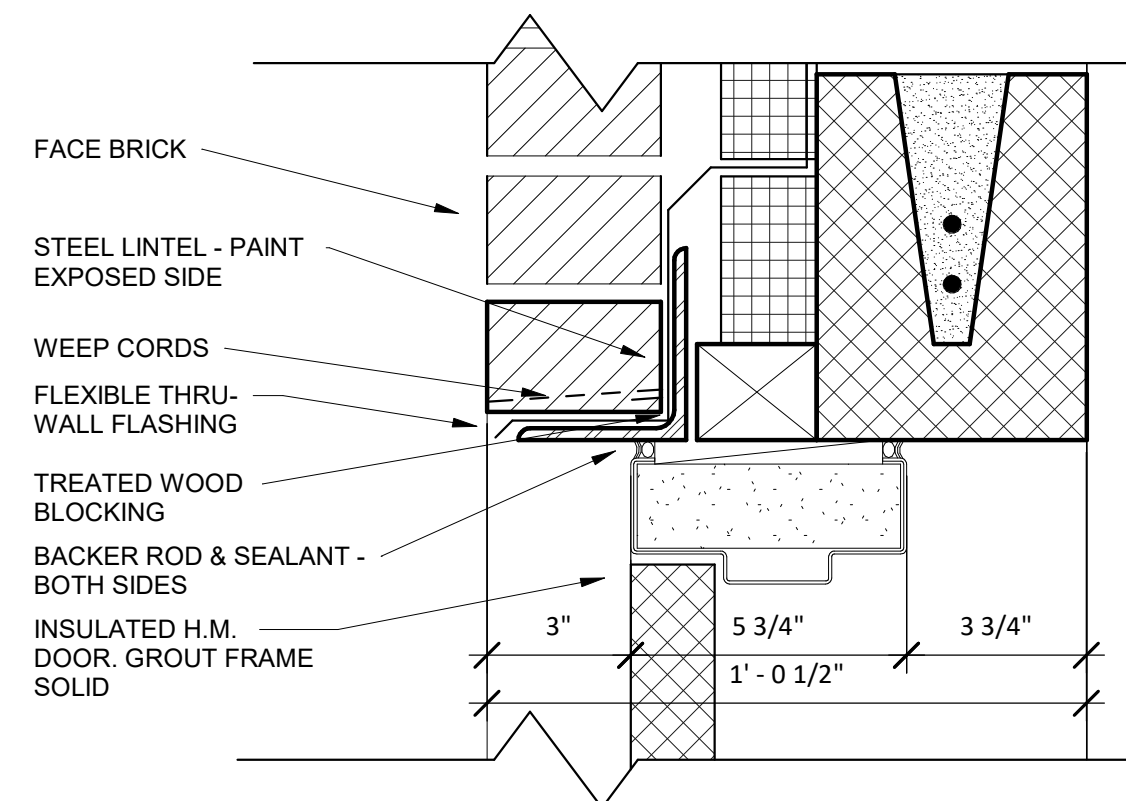
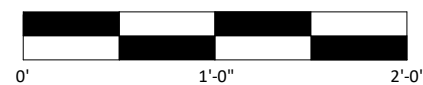
4 WINDOW HEAD/PARAPET
SCALE: 3" = 1'-0"



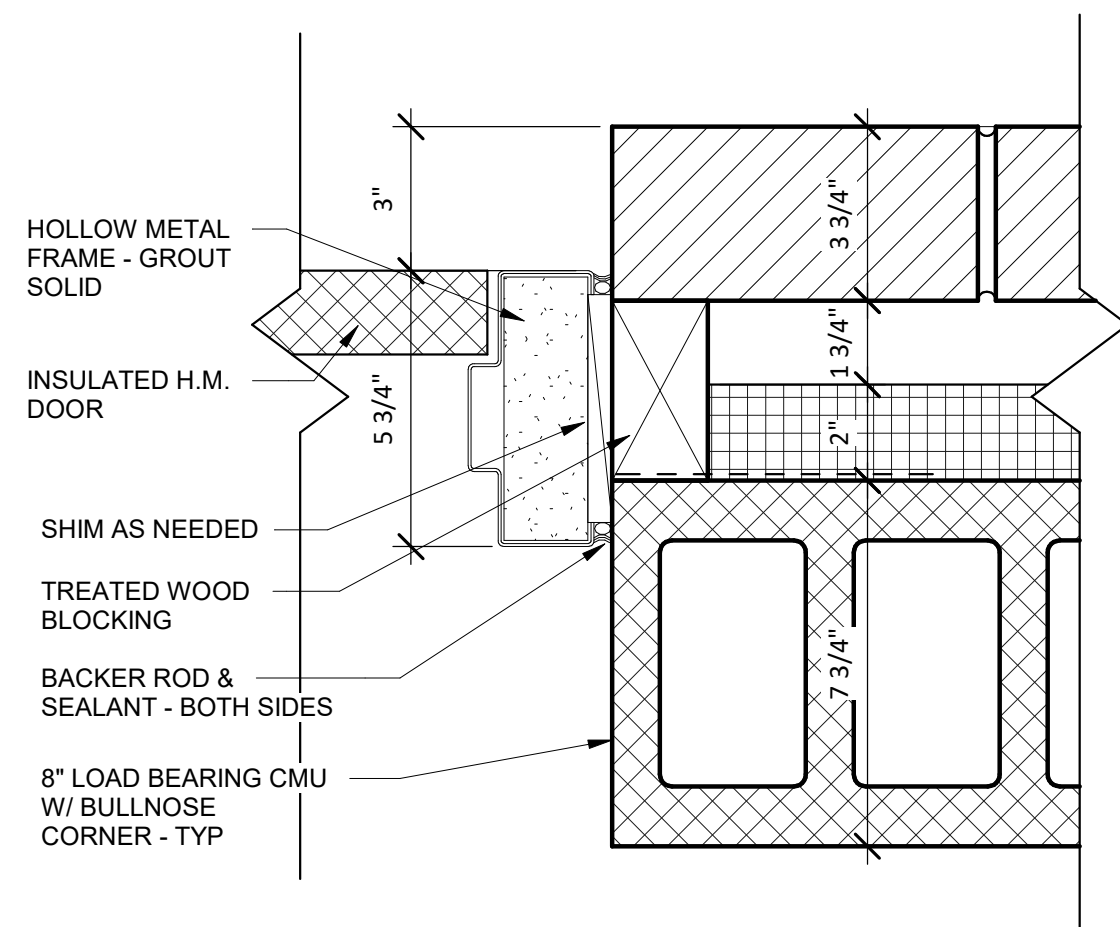
5 H.M. DOOR SILL DETAIL
SCALE: 3" = 1'-0"



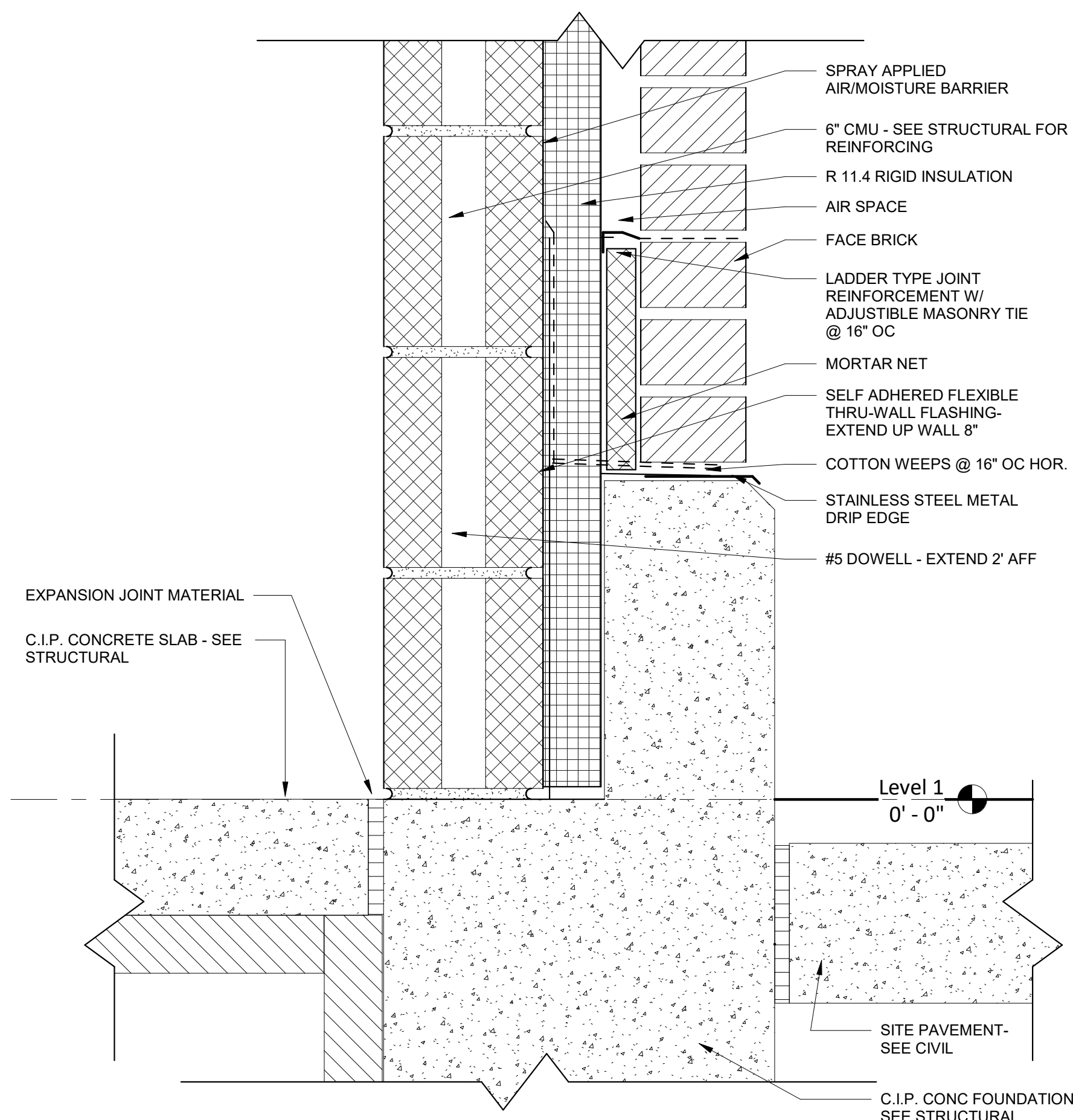
6 ADA SHOWER
SCALE: 1" = 1'-0"



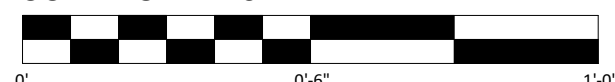
7 NEW EXTERIOR DOOR HEAD
SCALE: 3" = 1'-0"



9 H.M. DOOR JAMB DETAIL
SCALE: 3" = 1'-0"



8 WALL BASE
SCALE: 3" = 1'-0"



REMARKS

BY

DATE

REV.

DESIGNED

DRAWN

REVIEWED

APPROVED

WILLETT HOFMANN
& ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SURVEYING
625 32ND AVE SW CEDAR RAPIDS, IA 52404
1-319-378-1401



ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W. MILAN, IL 61264

DETAILS
© Copyright Willett, Hofmann & Associates, Inc.

PHASE

- ☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

DATE
10/21/2024

SHEET
No.
A5.01

NAME

10'-0"

HEIGHT ABOVE PROJECT 0'-0"

LEVEL NAME

HEIGHT ABOVE PROJECT 0'-0"

1

KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL

INDICATES DIRECTION OF TRUE NORTH

PLAN OR DETAIL NUMBER

PLAN OR DETAIL NAME

VIEW NAME

1/8" = 1'-0"

PLAN OR DETAIL SCALE

SIM

INDICATES SIMILAR DETAIL REFERENCED IN MULTIPLE LOCATIONS

DETAIL REFERRED TO BY SECTION CUT

M101

SHEET DETAIL IS LOCATED ON

T101

LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)

NEW

EXISTING TO BE REMOVED (SHORT DASHED PATTERN)

NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)

EXISTING

EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)

EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

HVAC SYMBOL LIST	
NOT ALL SYMBOLS MAY APPLY.	
SYMBOL:	DESCRIPTION:
	LOW PRESSURE CONDENSATE (0 TO 15 PSIG)
	LOW PRESSURE STEAM (0 TO 15 PSIG)
	SAFETY RELIEF VENT
	PIPE CAP
	PIPE DOWN
	PIPE UP OR UP/DOWN
	PITCH PIPE IN DIRECTION
	DIRECTION OF FLOW IN PIPE
	DIELECTRIC CONNECTION
	UNION/FLANGE
	SHUTOFF VALVE NORMALLY OPEN
	SHUTOFF VALVE NORMALLY CLOSED
	THROTTLING VALVE
	CONTROL VALVE (TWO-WAY)
	CHECK VALVE
	SAFETY/RELIEF VALVE
	VACUUM BREAKER
	'WYE' - STRAINER
	PRESSURE/TEMPERATURE TEST PLUG
	REDUCER - REFERENCE SPECIFICATION FOR CONCENTRIC/ECCENTRIC AND FOT/FOB
	MANUAL AIR VENT
	DRAIN VALVE WITH HOSE CONNECTION AND CAP
	PRESSURE GAUGE (FURNISHED WITH BALL VALVE)
	STEAM TRAP (REFER TO SCHEDULE)

HVAC SYMBOL LIST	
NOT ALL SYMBOLS MAY APPLY.	
SYMBOL:	DESCRIPTION:
	DIRECTION OF AIR FLOW
	FLEXIBLE DUCT
	MANUAL VOLUME DAMPER
	RISE IN DIRECTION OF AIR FLOW
	DROP IN DIRECTION OF AIR FLOW
	DUCT CAP
	DUCT DOWN
	DUCT UP
	EXHAUST/RELIEF AIR DUCT SECTION
	AIR TERMINAL PROPERTIES SYMBOL NECK SIZE/CFM
	PARALLEL BLADE DAMPER (REFER TO SCHEDULE)
	OCCUPANCY SENSOR
	PRESSURE SENSOR/MONITOR
	THERMOSTAT/SENSOR
	THERMOSTAT/SENSOR WITH HEAVY DUTY ENCLOSURE
	TEMPERATURE SENSOR WITH WELL
	THERMOMETER WITH WELL (FILLED TYPE)

HVAC ABBREVIATION KEY	
ABBR:	DESCRIPTION:
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
C	COMMON
CO	CLEANOUT
DN	DOWN
FD	FIRE DAMPER
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
N.C.	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
PS	PRESSURE SWITCH
SCCR	SHORT CIRCUIT CURRENT RATING
TYP	TYPICAL
UC-1	DOOR UNDERCUT BY OTHERS (1" TYPICAL)
UON	UNLESS OTHERWISE NOTED

DUCT ABBREVIATION KEY	
ABBR.	DESCRIPTION
EA	EXHAUST AIR

HVAC SHEET INDEX	
M0.00	HVAC COVERSHEET
M1.01	LEVEL 1 PLAN - HVAC - MAINT
M3.00	HVAC ENLARGED PLANS
M4.00	HVAC DETAILS
M6.00	HVAC SCHEDULES
GRAND TOTAL: 5	

TAB POST-CONSTRUCTION NOTES:

- AFTER CONSTRUCTION ACTIVITIES ARE COMPLETE, TESTING, ADJUSTING (TAB) AND BALANCING CONTRACTOR SHALL REBALANCE EXHAUST FANS AS REQUIRED TO ACHIEVE THE NEW AIRFLOW VALUES SHOWN ON THE CONSTRUCTION DRAWINGS.
- TAB CONTRACTOR SHALL COMPILE AND SUBMIT COPIES OF THE FINAL POST-CONSTRUCTION TAB REPORT AS REQUIRED BY SECTION 23 06 93.
- THE FINAL POST CONSTRUCTION REPORT SHALL INCLUDE ALL ITEMS REQUIRED IN THE SPECIFICATIONS.

PIPING GENERAL NOTES:

- THE SIZE OF BRANCH PIPING TO TERMINAL HEATING DEVICES AND COILS SHALL BE 3/4" UNLESS NOTED OTHERWISE.
- PIPE DRAIN LINES FROM EQUIPMENT TO NEAREST FLOOR DRAIN.

MECHANICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING, VENTILATION, PIPING, AND TEMPERATURE CONTROL.

- EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
- NOT ALL EXISTING DUCTWORK AND PIPING IS SHOWN. VERIFY EXISTING CONDITIONS BEFORE STARTING WORK. NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.
- FIELD VERIFY THE AVAILABLE CLEARANCES FOR DUCTWORK AND PIPING BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
- EACH CONTRACTOR SHALL CUT AND PATCH ROOFS, WALLS, AND FLOORS ASSOCIATED WITH THEIR WORK.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF CEILINGS, CEILING TILES, AND CEILING GRIDS ASSOCIATED WITH AREAS OF WORK BY ALL CONTRACTORS. NOTIFY THE GENERAL CONTRACTOR OF AFFECTED AREAS PRIOR TO BIDDING.
- WHERE EXISTING MECHANICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, PIPING, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING MECHANICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.
- PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS THAT REMAIN ACTIVE.
- OBTAIN PERMISSION FROM OWNER BEFORE SHUTTING DOWN ANY SYSTEM FOR ANY REASON. MAINTAIN SERVICE TO ALL COMPONENTS THAT ARE TO REMAIN UNTIL NEW SYSTEMS ARE INSTALLED.
- MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR TIE IN AND SWITCHOVER. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM OWNER BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MAKE CHANGEOVER TO NEW SYSTEMS WITH MINIMUM OUTAGE.
- DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED.

MECHANICAL GENERAL NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING, VENTILATION, PIPING, AND TEMPERATURE CONTROL.

- DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT EXACT INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
- CATALOG AND MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE DESCRIPTION OF MATERIAL SCHEDULED ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL AND SCHEDULED PERFORMANCE TAKES PRECEDENCE OVER THE MODEL NUMBER. THE FIRST MANUFACTURER SCHEDULED IS THE BASIS OF DESIGN.
- DETERMINATION OF QUANTITIES OF MATERIAL AND EQUIPMENT REQUIRED SHALL BE MADE BY THE CONTRACTOR FROM THE DOCUMENTS. WHERE MATERIAL AND/OR QUANTITY DISCREPANCIES ARISE BETWEEN DRAWINGS, SCHEDULES AND/OR SPECIFICATIONS, THE HIGHER QUALITY/GREATER NUMBER SHALL GOVERN.
- DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
- COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCE REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
- REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
- ANY CHANGES REQUIRED TO ELIMINATE CONFLICTS OR THAT RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO OTHERS.
- EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
- REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIOVISUAL, AND OTHER MECHANICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
- EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
- IN AREAS WITH DRYWALL, CEILINGS COORDINATE LOCATIONS OF ACCESS PANELS WITH THE GC FOR ACCESS TO VALVES, DUCTWORK ACCESSORIES, DAMPERS, ETC. COORDINATE PANEL TYPE AND COLOR WITH ARCHITECT. NOTIFY THE GC OF THE REQUIRED ACCESS PANELS PRIOR TO BIDDING.
- SEAL ALL FLOOR, WALL, AND ROOF PENETRATIONS AIRTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE. PENETRATIONS THROUGH EXTERIOR WALLS AND ROOF SHALL BE SEALED AIRTIGHT WITH WATERPROOFING MATERIALS RECOMMENDED BY MANUFACTURER FOR OUTDOOR USE.
- CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALL, PARTITION, FLOOR, AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN ROOMS.
- WHERE PIPES AND DUCTS ARE SHOWN TO PENETRATE FLOORS, PROVIDE SLEEVED OPENINGS WITH THE TOP EDGE RAISED ABOVE FLOOR SURFACE IN ACCORDANCE WITH ALL RELEVANT SPEC SECTIONS. SEAL SLEEVE PERIMETER TO BE WATERTIGHT.
- EQUIPMENT SIZES AND SERVICE CLEARANCE REQUIREMENTS VARY AMONG DIFFERENT MANUFACTURERS. CONSULT APPROVED SHOP DRAWINGS FOR EQUIPMENT SIZES AND REQUIRED SERVICE CLEARANCES. COORDINATE WITH LAYOUT OF EQUIPMENT PADS, PIPING, DUCTWORK, ETC.
- DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
- MAINTAIN A MINIMUM WORKING CLEARANCE OF 3'-0" IN FRONT OF ALL ELECTRICAL EQUIPMENT REQUIRING MAINTENANCE, INSPECTION, AND TESTING INCLUDING BUT NOT LIMITED TO PANELS, DISTRIBUTION PANELS, SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, EQUIPMENT DISCONNECTS AND STARTERS.
- MAINTAIN THE DEDICATED ELECTRICAL EQUIPMENT SPACE DEFINED BY THE WIDTH / DEPTH OF ELECTRICAL EQUIPMENT MEASURED FROM THE FLOOR TO A HEIGHT 6'-0" ABOVE THE EQUIPMENT OR THE STRUCTURAL CEILING, WHICHEVER IS LOWER. SYSTEMS FOREIGN TO THE ELECTRICAL DISTRIBUTION SYSTEM ARE NOT ALLOWED IN THE DEDICATED ELECTRICAL SPACE INCLUDING: DUCTWORK, PIPING, ETC.
- PROVIDE CONCRETE EQUIPMENT PAD FOR ALL FLOOR MOUNTED EQUIPMENT. PAD SHALL EXTEND MINIMUM 6" BEYOND ALL SIDES OF EQUIPMENT EXCEPT WHERE PAD EXTENSION WOULD INTERFERE WITH WORKING SPACE AT EQUIPMENT CONTROL PANELS AND ELECTRICAL PANELS.
- DO NOT EXCEED 25 LBS PER HANGER AND A MINIMUM SPACING OF 2'-0" ON CENTER WHEN ATTACHING TO METAL ROOF DECKING (LIMITATION NOT REQUIRED WITH CONCRETE ON METAL DECK). THIS 25 LB. LOAD AND 2'-0" SPACING INCLUDE ADJACENT ELECTRICAL AND ARCHITECTURAL ITEMS HANGING FROM DECK. IF THE HANGER RESTRICTIONS CANNOT BE ACHIEVED, SUPPLEMENTAL FRAMING OFF STEEL FRAMING SHALL BE ADDED. ANCHORS EMBEDDED IN CONCRETE SHALL BE CRACKED CONCRETE APPROVED IN ACCORDANCE WITH SPECIFICATIONS.

APPLICABLE CODES	
CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:	
BUILDING CODE:	IBC 2021 EDITION
FIRE CODE:	IFC 2021 EDITION
PLUMBING CODE:	ILLINOIS PLUMBING CODE 2014 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LIFE SAFETY CODE:	NFPA 101 CURRENT EDITION
ENERGY CONSERVATION CODE:	IECC 2021
HEALTH DEPARTMENT CODE:	CURRENT EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

CONTRACTOR ABBREVIATION KEY	
ABBR:	DESCRIPTION:
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
H.C.	HEATING CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
T.C.C.	TEMPERATURE CONTROLS CONTRACTOR
V.C.	VENTILATION CONTRACTOR

CONTACT PERSONS:	
DESCRIPTION:	PERSON:
PROJECT MANAGER	MATT SYNDER
MECHANICAL	ZACH MANARY
ELECTRICAL	JEREMY VETTING

IMEG

www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967

0 1 2 3
REF. SCALE IN INCHES PROJECT #24001440.00

PHASE

☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST
☐

WHA No.

1854D23

DATE

10/21/24

SHEET

No.

M0.00

REMARKS

DESIGNED

ZACMAN

CHECKER

PETCOU

REV.

DATE

BY

WILETT HOFMANN & ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SURVEYING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.376.1401

WILETT HOFMANN & ASSOCIATES, INC.
HVAC COVERSHEET
851 10TH AVE W, MILAN, IL 61264

This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright

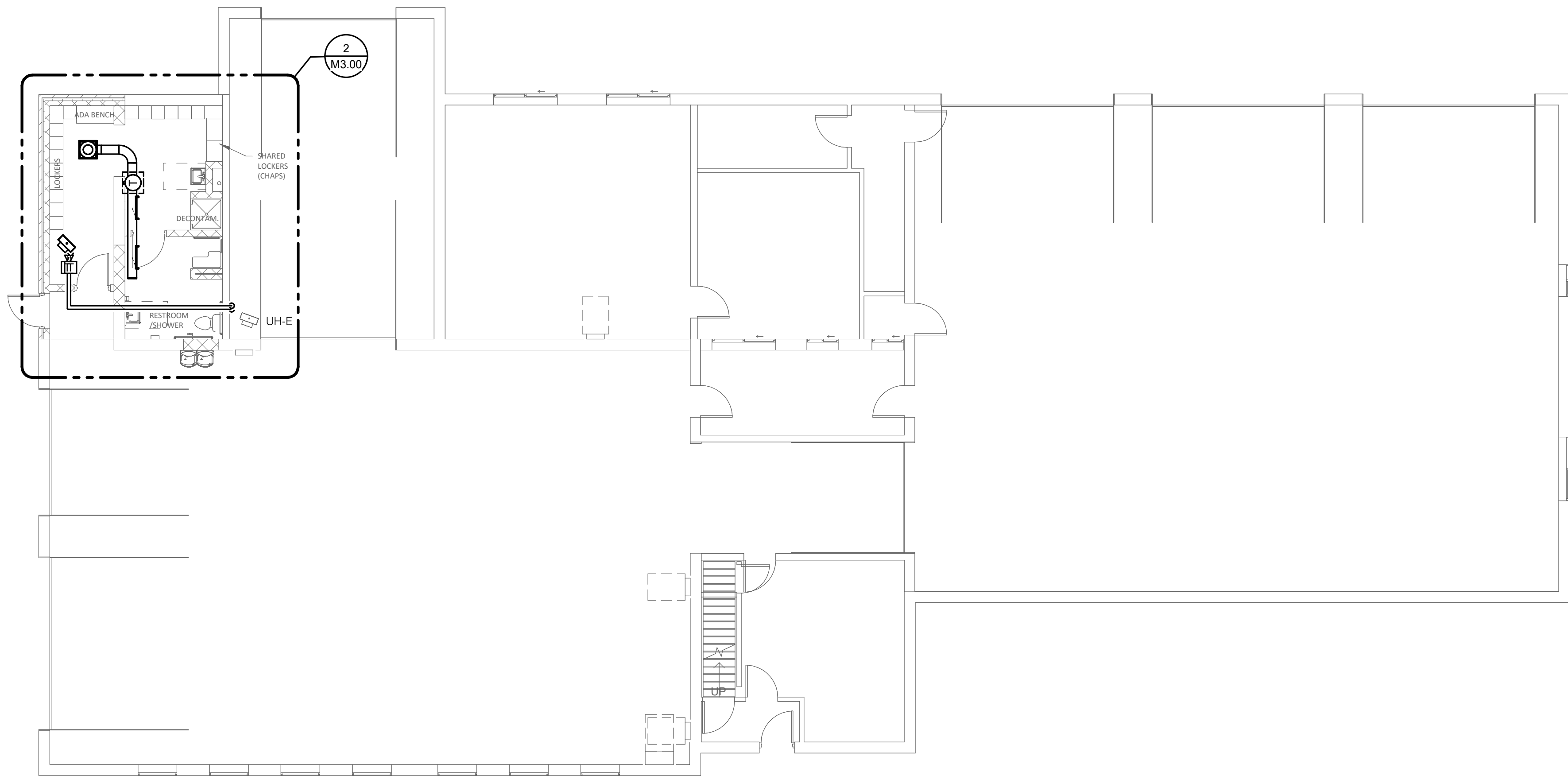


1

LEVEL 1 DEMOLITION PLAN - HVAC

1/8" = 1'-0"

REFER TO 1/M3.00



2

LEVEL 1 PLAN - HVAC

1/8" = 1'-0"

IMEG 623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

0 1 2 3
REF. SCALE IN INCHES PROJECT #24001440.00

PHASE

- ☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

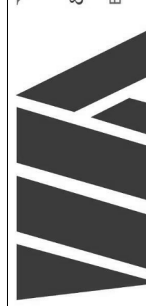
DATE
10/21/24

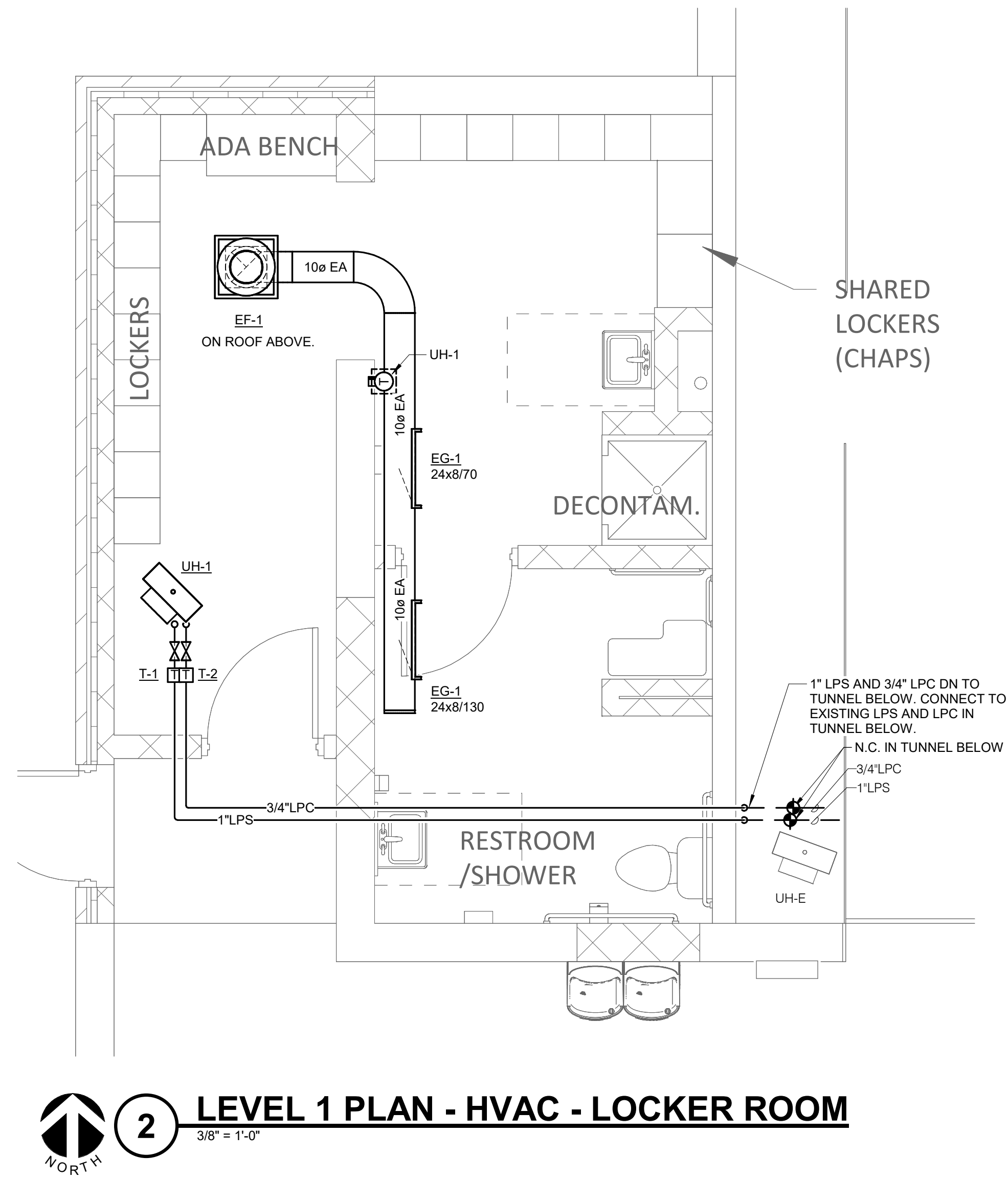
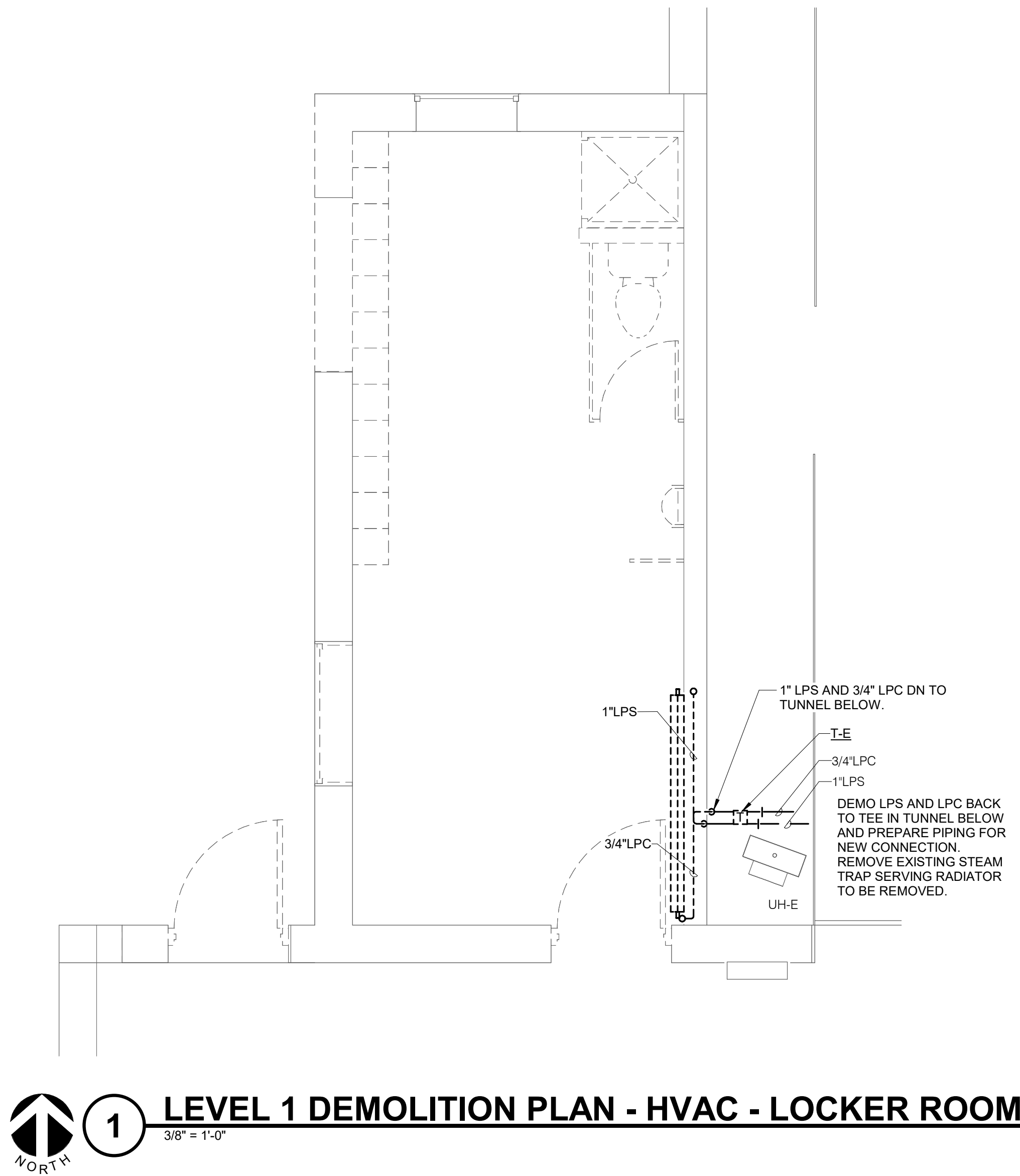
SHEET
No.

M1.01

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264
LEVEL 1 PLAN - HVAC - MAINT

WILLETT HOFMANN
& ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SERVING
622 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.276.1401





IMEG 623 28TH AVENUE
ROCK ISLAND, IL 61201
P. 309.786.0673 F. 309.786.5967
www.imegcorp.com

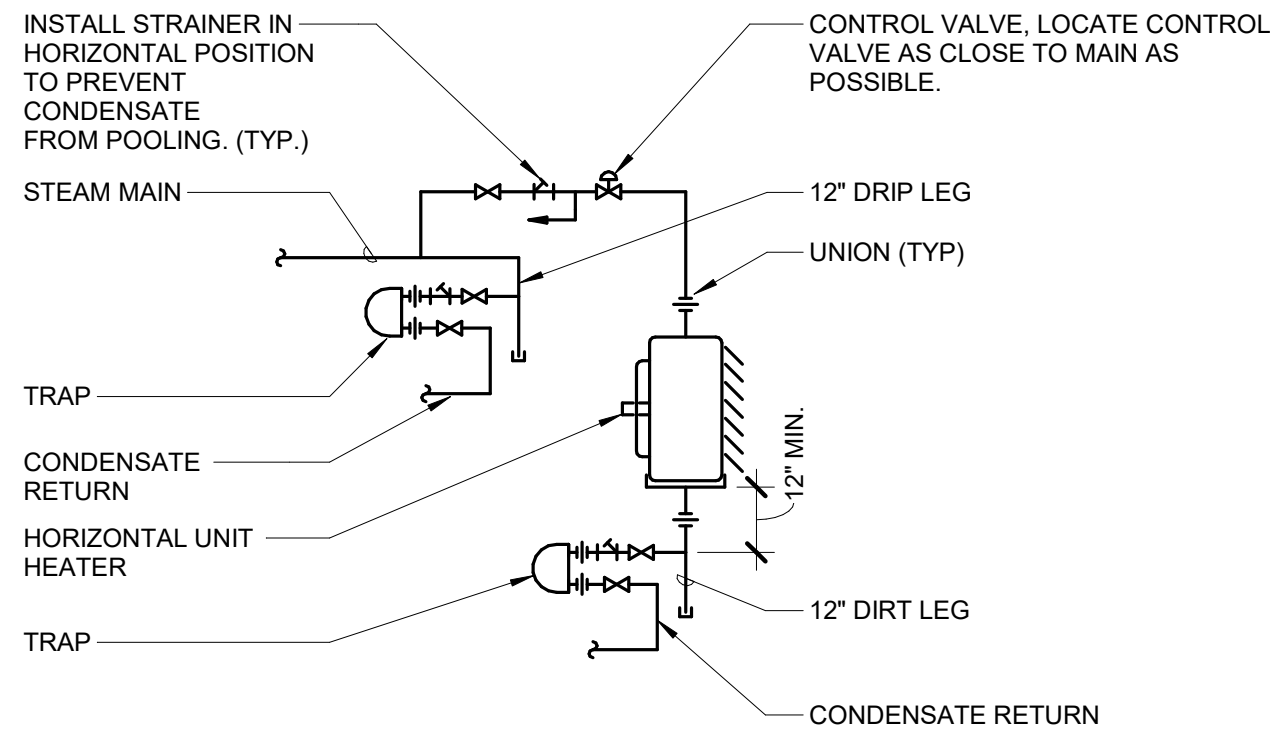
IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

REF. SCALE IN INCHES PROJECT #24001440.00

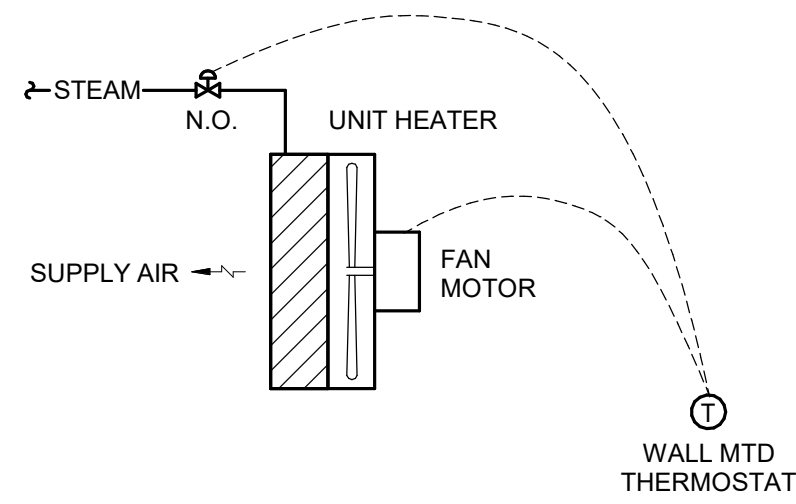
PHASE	WHA No.	DATE	SHEET No.
☐ PRELIM	1854D23	10/21/24	M3.00
☐ PERMIT			
☐ FINAL			
☒ BID			
☐ CONST			

DESIGNED	CHECKED	DATE	BY	REMARKS
ZACMAN	PETCOU			

WILLETT HOFMANN & ASSOCIATES, INC. ENGINEERING ARCHITECTURE LAND SERVING 6223 32ND AVE SW CEDAR RAPIDS, IA 52404 1.319.276.1401	WHA No. 1854D23	DATE 10/21/24	SHEET No. M3.00

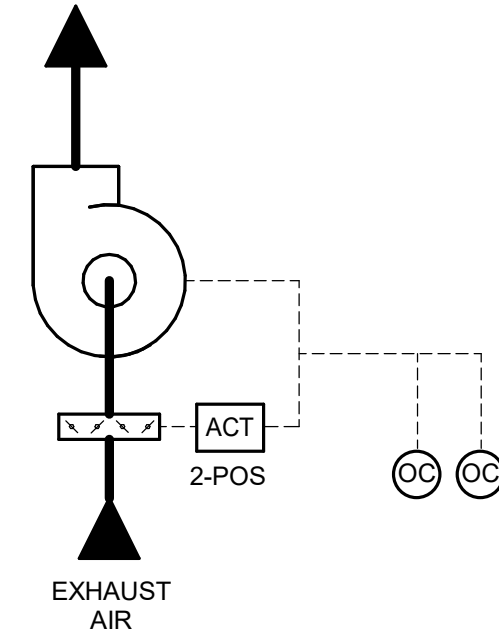


1 UNIT HEATER - STEAM PIPING
NO SCALE



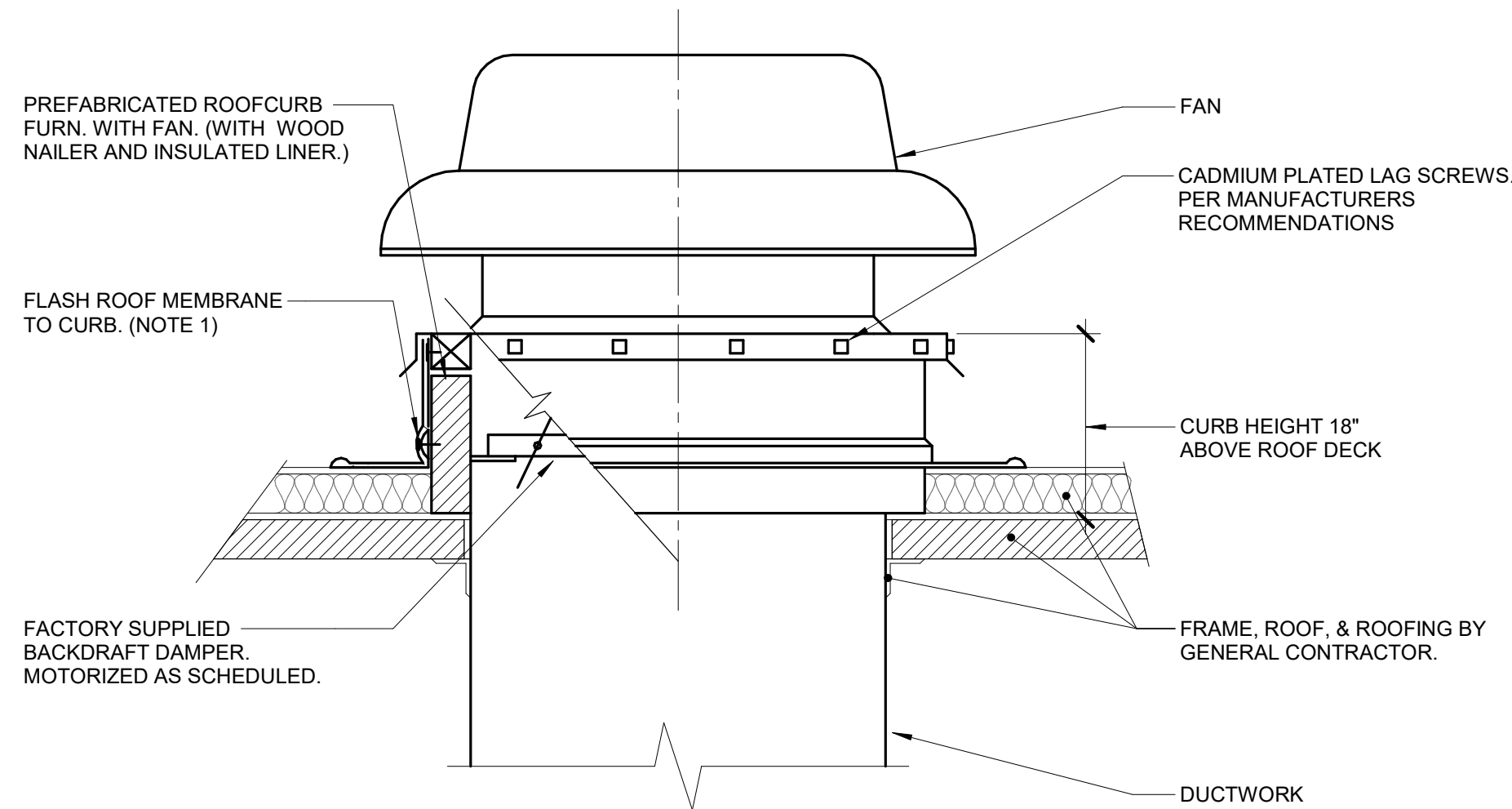
SEQUENCE OF OPERATION:
THERMOSTAT SHALL MODULATE THE CONTROL VALVE AND CYCLE THE UNIT FAN TOGETHER TO MAINTAIN A SPACE TEMPERATURE OF 70°F (ADJ.).

2 UNIT HEATER CONTROL - STEAM
NO SCALE



SEQUENCE OF OPERATION:
EXHAUST FAN SHALL RUN CONTINUOUSLY WHEN EITHER RESTROOM IS OCCUPIED.
MECHANICAL CONTRACTOR SHALL WIRE DAMPER INLINE WITH FAN POWER TO FULLY OPEN WHEN FAN IS ENERGIZED. WHEN FAN IS DE-ENERGIZED, 2-POSITION DAMPER SHALL FULLY CLOSE.

3 FAN - RUN CONTINUOUSLY
NO SCALE



NOTES:

1. ALL ROOF FLASHING SHALL BE PER ROOFING MANUFACTURERS RECOMMENDATIONS.

4 ROOF FAN/HOOD CURB
NO SCALE

IMEG 623 28TH AVENUE
ROCK ISLAND, IL 61201
P. 309.786.0673 F. 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

REF. SCALE IN INCHES PROJECT #24001440.00

DESIGNED	CHECKED	DATE	BY	REMARKS
ZACMAN	PETCOU			
ENGINEERING	ARCHITECTURE	LAND SERVING		
623 32ND AVE SW CEDAR RAPIDS, IA 52404				
1.319.776.1401				

WILLET HOFMANN & ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SERVING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.776.1401

WILLET HOFMANN & ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SERVING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.776.1401

PHASE
☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

DATE
10/21/24

SHEET No.
M4.00

This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hofmann & Associates, Inc.

UNIT HEATER SCHEDULE - STEAM (UH)

NOTES:
1. STEAM PRESSURE INDICATED IS THE PRESSURE AVAILABLE DOWNSTREAM OF THE CONTROL VALVE.

TAG NAME	FAN				STEAM COIL					ELECTRICAL								CONTROL		MAXIMUM DIMENSIONS			WEIGHT (MAXIMUM)	MANUFACTURER	MODEL	NOTES
	CFM DESIGN	AIR DIRECTION	QTY	MHP EA	MBH	LB/HR	PSIG (NOTE 1)	EAT DB °F	LAT DB °F	VOLTS	PH	NO. OF WIRES	DISCONNECT		CNTLR/STARTER		SCCR	TYPE [H]	DIAGRAM	WIDTH	HEIGHT	DEPTH	OPERATING			
													BY [A]	TYPE [B]	BY [A]	TYPE [C]										
UH-1	730	HORIZONTAL	1	0.066667	47	49	(2)	60	120	120	1	3	MFR	NF	MFR	FV	5,000	TYPE 4	2/M4.00	20"	20"	13"	45 lb	DAIKIN	UHH	

PIPE INSULATION SCHEDULE (HVAC)

GENERAL NOTES:
1. REFER TO THE SPECIFICATIONS FOR TYPE DESCRIPTIONS AND JACKETING REQUIREMENTS. VALUES LISTED BELOW ARE BASED ON ASHRAE / IECC REQUIREMENTS.
2. PROVIDE RIGID INSERT AT HANGERS, EITHER PRE-MANUFACTURED COUPLINGS (REFER TO PIPE HANGER AND SUPPORTS SPECIFICATIONS) OR TYPE C INSULATION. SEE SPEC. FOR MORE DETAILS.
3. DIRECT BUIRED PIPING SHALL ONLY USE TYPE C. REDUCTION IN THICKNESS FOR DIRECT BURED PIPING IS ALLOWED PER ASHRAE / IECC AS APPLICABLE.

PIPE SYSTEM	INSULATION TYPE	INSULATION THICKNESS PER NOMINAL PIPE OR TUBE SIZE			NOTES
		< 1"	1" TO < 1.5"	1.5" TO < 4"	
23 PIPING - STEAM					
LPC - LOW PRESSURE CONDENSATE (0 to 15 psig)	H (MinWol)	2.5"	2.5"	2.5"	
LPS - LOW PRESSURE STEAM (0 to 15 psig)	H (MinWol)	2.5"	2.5"	2.5"	

FAN SCHEDULE (EF)

NOTES:
1. PROVIDE WITH MFR FURNISHED SPEED CONTROLS, MOTORIZED BACKDRAFT DAMPER, AND CURB.

TAG NAME	SERVICE	ARRANGMENT	CFM	TOTAL S.P. IN. WC	WHEEL DIA	DRIVE	RPM (MAXIMUM)	MOTOR		DAMPER	ELECTRICAL								CONTROL DIAGRAM	CURB / PAD		MAXIMUM DIMENSIONS				WEIGHT LBS	MANUFACTURER	MODEL	NOTES
			DESIGN					MHP [E]	BHP [E]	TYPE	VOLTS	PH	DISCONNECT		CNTLR/STARTER		SCCR	TYPE / BY [G]		HEIGHT	WIDTH	HEIGHT	DEPTH	OPERATING (MAXIMUM)					
													BY [A]	TYPE [B]	BY [A]	TYPE [C]													
EF-1	EXHAUST	DOWNBLAST	200	0.75	10"	DIRECT DRIVE	1750	0.25	0.17	MOTORIZED	120	1	MFR	NF	MFR	ECM	5,000	3/M4.00	MFR	18"	2'-0"	1'-10"	2'-0"	50	COOK	101 ACED	NOTE 1		

AIR TERMINAL SCHEDULE (EG, RG, SD, etc.)

NOTES:
1. REFER TO DRAWINGS FOR NECK SIZE. ALL BRANCH DUCTWORK TO AIR TERMINALS SHALL BE NECK SIZE UNLESS NOTED OTHERWISE.
2. CONTRACTOR SHALL DETERMINE PROPER BORDER TYPE TO MATCH APPLICATION.

TAG NAME	MATERIAL	FINISH	FACE SIZE (NOTE 1,2)		BORDER TYPE (NOTE 3)	VOLUME DAMPER	MANUFACTURER	MODEL	NOTES
EG-1	ALUMINUM	WHITE	24"	8"	DUCT MOUNTED	Yes	TITUS	S8F	SPIRAL DUCT MOUNTED

TRAP SCHEDULE

NOTES:
1. CAPACITY LISTED IS FOR EACH TRAP AND INCLUDES SAFETY FACTOR.
2. SUITABLE TO 125 PSIG. SIDE INLET & OUTLET, SS FLOAT MECHANISM AND VALVE, CAST IRON BODY, BALANCED PRESSURE THERMOSTATIC AIR VENT, ALL INTERNALS REPLACEABLE IN-LINE.
3. CAPACITY AT OTHER DIFFERENTIAL PRESSURES SHALL BE AT LEAST 525#/HR AT 10 PSID, AND 1080#/HR AT 75 PSID. 1/8" ORIFICE.
4. WITH INTEGRAL VACUUM BREAKER.

TAG NAME	EQUIPMENT SERVED	TYPE	SAFETY FACTOR	SIZE	CAPACITY LB HR (NOTE 1)	PRESSURE DIFFERENTIAL	MANUFACTURER	MODEL	NOTES
T-1	UH-1	F & T	2	1"	60	0.25	ARMSTRONG	125-A SERIES	NOTES 2, 3, & 4
T-2	UH-1	F & T	2	1"	60	0.25	ARMSTRONG	125-A SERIES	NOTES 2, 3, & 4

SCHEDULE GENERAL NOTES:

A. DISCONNECT AND CONTROLLER STARTER FURNISHED AND INSTALLED BY:
MFR = MANUFACTURER
EG = ELECTRICAL CONTRACTOR.
MC = FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR.
MFR/EC = FURNISHED LOOSE BY MANUFACTURER INSTALLED BY ELECTRICAL CONTRACTOR.
TCC = TEMPERATURE CONTROL CONTRACTOR

B. DISCONNECT TYPE:
CB = CIRCUIT BREAKER
F = FUSED
NF = NON-FUSED
PLUG = PLUG AND CORD

C. CONTROLLER STARTER TYPE:
FV = FULL VOLTAGE
WYE = WYE-DELTA
SS = SOLID STATE (SOFT START)
MS = MANUAL STARTER
VFD = VARIABLE FREQUENCY DRIVE
VFD/B = VARIABLE FREQUENCY DRIVE WITH BYPASS
YD = WYE - DELTA
ECM = ELECTRONICALLY COMMUTATED MOTOR

D. FAN RPM SHALL NOT EXCEED 110% OF SCHEDULED VALUE. WITH THE SCHEDULED WHEEL TYPE. SUBSTITUTION OF BI OR BIA FANS FOR FC IS ACCEPTABLE IF EFFICIENCY IS NOT LOWER.

E. NO EQUIPMENT SHALL BE SELECTED ABOVE 90% OF MOTOR NAME PLATE RATING.

F. MUST BE WITHIN +/- 10% OF SCHEDULED RPM.

G. CURB TYPE:
MFR = STANDARD CURB BY MANUFACTURER
GC = BY GENERAL CONTRACTOR
SAC = SOUND ATTENUATOR CURB



623 28TH AVENUE
ROCK ISLAND, IL 61201
P. 309.786.0673 F. 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

0123

REF. SCALE IN INCHES

PROJECT #24001440.00

- PHASE
- ☐ PRELIM
- ☐ PERMIT
- ☐ FINAL
- ☒ BID
- ☐ CONST
- ☐

WHA No.
1854D23

DATE
10/21/24

SHEET
No.

M6.00

WILLETT HOFMANN
& ASSOCIATES INC
ENGINEERING ARCHITECTURE LAND SERVING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1-319-776-1401



ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

HVAC SCHEDULES

This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hofmann & Associates, Inc. WYCA

NAME ← **LEVEL NAME**
10'-0" ← **HEIGHT ABOVE PROJECT 0'-0"**

VIEW NAME
 INDICATES DIRECTION OF TRUE NORTH
 PLAN OR DETAIL NUMBER
 PLAN OR DETAIL NAME
 1/8" = 1'-0"
 PLAN OR DETAIL SCALE

LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
 ——— NEW
 - - - - - EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
 - - - - - NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
 ——— EXISTING
 - - - - - EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
 - - - - - EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

+ INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

APPLICABLE CODES	
CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:	
BUILDING CODE:	IBC 2021 EDITION
FIRE CODE:	IFC 2021 EDITION
PLUMBING CODE:	ILLINOIS PLUMBING CODE 2014 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LIFE SAFETY CODE:	NFPA 101 CURRENT EDITION
ENERGY CONSERVATION CODE:	IECC 2021
HEALTH DEPARTMENT CODE:	CURRENT EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

CONTRACTOR ABBREVIATION KEY	
ABBR:	DESCRIPTION:
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
H.C.	HEATING CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
T.C.C.	TEMPERATURE CONTROLS CONTRACTOR
V.C.	VENTILATION CONTRACTOR

CONTACT PERSONS:	
DESCRIPTION:	PERSON:
PROJECT MANAGER	MATT SYNDER
MECHANICAL	ZACH MANARY
ELECTRICAL	JEREMY VETTING

ELECTRICAL SYMBOL LIST			
SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
	<u>ECONN</u>	26 05 33	ELECTRICAL CONNECTION
	<u>JB</u>	26 05 33	JUNCTION BOX
	<u>PANEL-####</u>	EXISTING	PANELBOARD - SURFACE MOUNT
	<u>DS-#/FDS-#</u>	EXISTING	DISCONNECT SWITCH / FUSED DISCONNECT SWITCH
	<u>HD</u>	ARCH	HAND DRYER
	<u>PB</u>	EXISTING	MOMENTARY PUSHBUTTON OPERATOR

ELECTRICAL SYMBOL LIST			
SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
	<u>REC-DUP</u>	EXISTING	DUPLEX RECEPTACLE, 125V
	<u>REC-DUP-GFI</u>	26 27 26	DUPLEX GFI RECEPTACLE, 125V
	<u>REC-DUP-WP</u>	26 27 26	DUPLEX GFI WEATHERPROOF RECEPTACLE 125V

ELECTRICAL SYMBOL LIST			
SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
COMMON AND SEQUENCE OF OPERATION SUBSCRIPTS			SUBSCRIPTS: TYPE / PROGRAMMING # = 15, 30, 75, 110, 177 CANDELA RATING CD = CANDELA RATING SELECTED BY NICET DESIGNER
	<u>FACP-#</u>	EXISTING	FIRE ALARM CONTROL PANEL
	<u>FA-130</u>	EXISTING	FIRE ALARM MANUAL PULL STATION
	<u>FA-200</u>	28 31 00	FIRE ALARM VISUAL ALARM DEVICE, CEILING OR WALL MOUNT # = CANDELA RATING. CD = CANDELA RATING SELECTED BY NICET DESIGNER
	<u>FA-210</u>	28 31 00	AUDIO HORN/CHIME ALARM DEVICE, CEILING OR WALL MOUNTED
	<u>FA-211</u>	28 31 00	COMBINATION AUDIO HORN/CHIME AND VISUAL ALARM DEVICE, CEILING OR WALL MOUNTED # = CANDELA RATING CD = CANDELA RATING SELECTED BY NICET DESIGNER

CONDUIT INSTALLATION SCHEDULE		
THE FOLLOWING SCHEDULE SHALL BE ADHERED TO UNLESS THEY CONSTITUTE A VIOLATION OF APPLICABLE CODES OR ARE NOTED OTHERWISE ON THE DRAWINGS. THE INSTALLATION OF RMC CONDUIT WILL BE PERMITTED IN PLACE OF ALL CONDUIT SPECIFIED IN THIS SCHEDULE. REFER TO CONDUIT AND BOXES SPECIFICATION 26 05 33 FOR ADDITIONAL INFORMATION.		
INSTALLATION TYPE	RMC	EMT
BRANCH CIRCUITS: LIGHTING, RECEPTACLES, CONTROLS, ETC.		X
MECHANICAL EQUIPMENT FEEDERS: PUMPS, CHILLERS, AIR HANDLING UNITS, ETC.		X
CONTROLS (LIGHTING, POWER, BUILDING AUTOMATION, ETC.)		X
WET AND DAMP LOCATIONS: (CONDUIT, BOXES, FITTINGS, INSTALLED AND EQUIPPED TO PREVENT WATER ENTRY)	X	
INTERIOR LOCATIONS WITHOUT FINISHED CEILINGS: CONCEALED IN WALL, EXPOSED ABOVE CEILINGS		X
EXISTING INTERIOR LOCATIONS WITH FINISHED CEILINGS AND WALLS: CONCEALED IN WALLS AND ABOVE FINISHED CEILING UNLESS OTHERWISE NOTED		X

ELECTRICAL EQUIPMENT TAGS		
TAG:	DESCRIPTION:	RELATED SPECIFICATION
<u>DP-#</u>	DISTRIBUTION PANEL	EXISTING

EQUIPMENT ABBREVIATION KEY	
ABBR:	DESCRIPTION:
EWC	ELECTRIC WATER COOLER
HD	HAND DRYER

ELECTRICAL ABBREVIATION KEY	
ABBR:	DESCRIPTION:
ABV	ABOVE
AFC	ABOVE FINISHED CEILING
AFB	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
BC	BELOW COUNTER
C	CONDUIT (BRANCH CIRCUIT OR FEEDER CONTEXT)
CO	CONDUIT AND BOX ROUGH-IN ONLY (ROUGH-IN ONLY)
EG	EQUIPMENT GROUND
EGC	EQUIPMENT GROUNDING CONDUCTOR
EOL	END OF LINE
EPO	EMERGENCY POWER OFF
GFR	GROUND FAULT REMOTE
HOA	HAND/OFF/AUTO
NC	NORMALLY CLOSED
NEMA #	NEMA RATING
NIC	NOT IN CONTRACTED SCOPE
NO	NORMALLY OPEN
ROOF	EQUIPMENT LOCATED ON ROOF ABOVE
SM	SURFACE MOUNTED
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED

ELECTRICAL INSTALLATION NOTES:

1. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE ADA STANDARDS FOR ACCESSIBLE DESIGN. REFER TO THE ADA GUIDELINES FOR ALL CONFIGURATION DETAILS ON THIS PAGE FOR ADDITIONAL INFORMATION.
2. CIRCUIT NUMBERS ARE SHOWN FOR CIRCUIT IDENTIFICATION. CIRCUITING SHALL AGREE WITH NUMBERING ON THE PANEL PROVIDED. COMMON NEUTRALS MAY NOT BE USED FOR BRANCH CIRCUITS. BALANCE THE LOAD ON PANEL AS EVENLY AS POSSIBLE BETWEEN EACH PHASE.
3. FLUSH MOUNT ALL LIGHTING CONTROL DEVICES AT +42" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED.
4. FLUSH MOUNT ALL GFI RECEPTACLES AT 18" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED. RECEPTACLES AND OUTLETS MAY BE SURFACE MOUNTED WHEN CONDUIT IS SPECIFIED EXPOSED. MOUNT EXTERIOR LOCATED RECEPTACLES WITH WHILE-IN-USE COVERS AT +20" FROM FINISHED GRADE (CENTER DIMENSIONS) TO MAINTAIN INSTALLATION ADA COMPLIANCE.
5. CONNECTION FOR HOT WATER WATER COOLER (EWC) SHALL BE A JUNCTION BOX CONCEALED BEHIND WATER COOLER ACCESS PLATE OR BE A GFI RECEPTACLE LOCATED DIRECTLY BELOW AND CENTERED ON EWC. CONTRACTOR SHALL VERIFY TYPE OF EWC TO BE INSTALLED.
6. INSTALL ALL WALL MOUNTED FIRE ALARM NOTIFICATION DEVICES AT 90" ABOVE FINISHED FLOOR OR 6" BELOW THE CEILING, WHICHEVER IS LOWER, EXCEPT WHERE OTHERWISE NOTED. HEIGHT SHALL BE MEASURED TO THE TOP OF THE DEVICE.
7. CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL CEILING MOUNTED DEVICES AND EQUIPMENT WITH LUMINAIRES, SPRINKLER, AND CEILING DIFFUSERS. CENTER ALL DEVICES IN CEILING TILE PATTERN. SMOKE DETECTORS, CARBON MONOXIDE DETECTORS, AND CARBON MONOXIDE DETECTORS SHALL BE MOUNTED AT LEAST 36 INCHES FROM AN AIR SUPPLY DIFFUSER OR RETURN GRILLE. CARBON MONOXIDE DETECTORS SHALL BE LOCATED 10 PLUS FT FROM FIRE PLACES, COOKING, AND SIMILAR FLAME-BURNING APPLIANCES.
8. CONTRACTOR SHALL VERIFY ALL EQUIPMENT LOCATIONS WITH ARCHITECTURAL PLANS, ELEVATIONS, AND REVISED SHOP DRAWINGS. PRIOR TO MAKING THE ACTUAL ELECTRICAL INSTALLATION, THE LOCATION OF ALL CONTRACTOR DEVICES, CONDUITS, CABLES, OUTLETS, OR CONNECTION LOCATIONS TO ACCOMMODATE EQUIPMENT.
9. ELECTRICAL EQUIPMENT SHALL BE MOUNTED TO AVOID IMPEDANCE OF, OPERATION OF, AND/OR ACCESS TO ELECTRICAL AND MECHANICAL EQUIPMENT. ALL MOUNTING OF ELECTRICAL EQUIPMENT, ON EQUIPMENT SUPPLIED BY ANOTHER CONTRACTOR, SHALL BE APPROVED IN ADVANCE BY THE OTHER CONTRACTOR.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPENINGS REQUIRED IN WALLS. ALL OPENINGS SHALL BE REPAIRED TO MATCH EXISTING BY A QUALIFIED CONTRACTOR AT THE EXPENSE OF THIS CONTRACTOR. ALL CONDUITS THROUGH WALLS SHALL BE GROUDED OR OPENED TO OPENINGS.
11. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO THE WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
12. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN AND ELECTRICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
13. ELECTRICAL IDENTIFICATION. REFER TO SPECIFICATION SECTION 26 05 53 FOR COLOR/LABEL REQUIREMENTS FOR CONDUIT, BOX, CABLE/WIRE, AND EQUIPMENT.

ELECTRICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL ELECTRICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, LIGHTING, POWER, FIRE ALARM, AND OTHER LOW VOLTAGE SYSTEMS.

1. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS AND REPORT CONFLICTS.
2. NOT ALL EXISTING EQUIPMENT, LUMINAIRES, AND CONDUIT ARE SHOWN. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS AND REPORT CONFLICTS.
3. ELECTRICAL CONTRACTOR SHALL REVIEW EXISTING CONDITIONS TO VERIFY ACCESSIBILITY TO THE AREAS OF THEIR WORK INCLUDING WALLS, FLOOR, CEILINGS, CEILING TILES/GIRD, AND ELEVATED ELECTRICAL RACKS. CONTRACTOR IS RESPONSIBLE FOR CUTTING, REMOVAL, PATCHING, AND REINSTALLATION OF AFFECTED AREAS ASSOCIATED WITH THEIR WORK BY COORDINATING WITH THE GENERAL CONTRACTOR OR QUALIFIED CONTRACTOR.
4. WHERE EXISTING ELECTRICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW ELECTRICAL RACKS, DUCTS, OR DUCTWORK OR FASHION THE FIT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING ELECTRICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.

RECEPTACLE SUBSCRIPT KEY:	
<u>DEVICE KEY:</u>	
DEVICE	# = MOUNTING (IF APPLICABLE) 1 = CIRCUIT NUMBER
	*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: A / 1
<u>ELECTRICAL MOUNTING SUBSCRIPT KEY:</u>	
A	MOUNT AT +6" TO CENTERLINE ABOVE COVER OR BACKSPLASH
H	MOUNT ORIENTED HORIZONTALLY
S	SURFACE MOUNTED
W	WEATHERPROOF WIRING DEVICE, NEMA 3R WHILE-IN-USE COVER, WR LISTED

ELECTRICAL SHEET INDEX	
E0.00	ELECTRICAL COVERSHEET
E0.01	ELECTRICAL LIGHTING COVERSHEET
E1.01	LEVEL 1 PLAN - ELECTRICAL - MAINT
E1.03	LEVEL 1 PLAN - LIGHTING - MAINT
E6.00	ELECTRICAL SCHEDULES
GRAND TOTAL: 5	

IMEG 623 26TH AVENUE
ROCK ISLAND, IL 61201
P. 309.785.0673 F. 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.

Illinois Design Firm Registration #18408975-0014

0 1 2 3
REF. SCALE IN INCHES PROJECT #24001144.00

LED LUMINAIRE SCHEDULE

(DESC) DOOR:		DISTRIBUTION:		BEAMWIDTH:		(L/L) LENS/LOUVER:			
FA - FLAT ALUMINUM		II - ANSI/IES TYPE 2 DISTRIBUTION		NSP - VERY NARROW SPOT		A - .125" ACRYLIC		K19 - KSH19 .156" ACRYLIC	
FS - FLAT STEEL		III - ANSI/IES TYPE 3 DISTRIBUTION		SP - SPOT		B - BAFFLE/LOUVER		M - MATTE DIFFUSE CLEAR	
RA - REGRESSED ALUMINUM		IV - ANSI/IES TYPE 4 DISTRIBUTION		MD - MEDIUM		C - CLEAR ALZAK		N - NONE	
RS - REGRESSED STEEL		V - ANSI/IES TYPE 5 DISTRIBUTION		WD - WIDE		F - FROSTED ACRYLIC		P - POLYCARBONATE	
FINISH:				VWD - VERY WIDE		G - TEMPERED GLASS		R - HIGH IMPACT DR ACRYLIC	
PAF - PAINT AFTER FABRICATION				WW - WALL WASH		K - KSH12 .125" ACRYLIC		SS - SEMI-SPECULAR CLEAR	
CPSA - COLOR-FINISH SELECTION BY ARCHITECT								O - OTHER (SEE DESCRIPTION)	
								[DESIGN SPECIFIC BLANKS]	
(MTG) MOUNTING:		RE - RECESSED				(WATT) PER:		FIX - FIXTURE, FT - FOOT, LAMP	
CL - CEILING SURFACE		SP - SUSPENDED				(TYPE) LED		RGB - COLOR CHANGING LED	
CV - COVE		SU - SURFACE				LED - LIGHT EMITTING DIODE		RGBW - COLOR CHANGING + WHITE	
FR - FLANGED RECESSED		UC - UNDER CABINET				TLED - TUBULAR LED LAMP		RGBA - COLOR CHANGING + AMBER	
P - PERIMETER		WL - WALL				OLED - ORGANIC LED		RLED - RETROFIT LED	
PL - POLE		O - OTHER (SEE DESCRIPTION)				DLED - DYNAMIC TUNABLE LED		WLED - WARM DIM LED	
(TYPE) DRIVER:									
0-10V - 0-10V DIMMING		EB - ELECTRONIC		HL - HIGH/LOW (100%/50%) STEP DIM				MV - MULTI-VOLTAGE ELECTRONIC	
DALI - DIGITAL ADDRESSABLE		ELV - ELECTRONIC LOW VOLTAGE		LINE - LINE VOLTAGE DIMMING				REM - REMOTE	
DMX - DIGITAL MULTIPLEX		EM - EMERGENCY BATTERY		ML - MULTI-LEVEL SWITCHING				O - OTHER (SEE DESCRIPTION)	

CATALOG NUMBER SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND CATALOG NUMBER ONLY. THE COMPLETE DESCRIPTION AND THE SPECIFICATION SHALL BE COORDINATED WITH THE CATALOG NUMBER TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN.

VERIFY AND COORDINATE ALL CEILING TYPES WITH LUMINAIRE MOUNTING AND TRIM REQUIREMENTS PRIOR TO THE RELEASE OF THE LUMINAIRE ORDER.
CONFIRM ALL COLORS AND FINISHES OF ALL LUMINAIRE COMPONENTS WITH ARCHITECT AND INTERIOR DESIGNER PRIOR TO THE RELEASE OF THE LUMINAIRE ORDER.
UNLESS INDICATED ON LIGHTING PLANS OR BELOW, REFER TO ARCHITECTURAL AND INTERIOR DESIGN ELEVATIONS, SECTIONS AND DETAILS FOR ALL SUSPENDED AND WALL MOUNTED LUMINAIRE MOUNTING HEIGHTS.

REFER TO SPECIFICATION SECTIONS LED LIGHTING 26 51 19 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
INTERIOR CORRELATED COLOR TEMPERATURE 3500K, COLOR RENDERING INDEX (CRI) AT OR ABOVE 80, UNLESS NOTED OTHERWISE.
EXTERIOR CORRELATED COLOR TEMPERATURE 4000/4100K, COLOR RENDERING INDEX (CRI) AT OR ABOVE 80, UNLESS NOTED OTHERWISE.

ITEM	DESCRIPTION	L/L	MTG	DIMENSIONS				WATT		LED			DRIVER		MANUFACTURER AND MODEL
				L	W	H	DIA.	ANSI WATTS	PER	TYPE	QTY	DELIVERED LUMENS (MIN)	VOLTS	TYPE	
F1	LED LENSED STRIP LIGHT, DIE-FORMED COLD-ROLLED STEEL HOUSING, ROUND FULL FROST LENS. PAF.	O	SU	4'-0"	3"	4"		35	FIX	LED	1	4500	120	0-10V	COOPER METALUX SNLED H.E. WILLIAMS 75 LED SERIES ACUITY LITHONIA ZL1D LS1 SDL
F2	SURFACE MOUNT FLAT PANEL, ALUMINUM FRAME, SATIN WHITE LENS.	O	SU	4'-0"	2'-0"	6"		29	FIX	LED	1	3000	120	0-10V	ACUITY LITHONIA CPX COOPER METALUX CGT CURRENT HLI COLUMBIA CBT SIGNIFY DAYBRITE FPZ
F2E	SIMILAR TO F2 W/ EMERGENCY BATTERY.	O	SU	4'-0"	2'-0"	6"		29	FIX	LED	1	NORMAL: 3000 EMERGENCY: 1000	120	0-10V EM	REFER TO F2
S1	WALL PACK, GLASS LENS, DIE-CAST ALUMINUM HOUSING, GASKETED, VISUAL COMFORT FORWARD THROW DISTRIBUTION, ZERO UPLIGHT, IP65 RATED, SUITABLE FOR OPERATION IN TEMPERATURES BETWEEN -30 DEGREE CELSIUS AND 40 DEGREE CELSIUS, PHOTOCELL, MOTION SENSOR, FINISH SELECTION BY ARCHITECT.	G	WL @9'-0"	9"	8"	5 1/2"		11	FIX	LED	1	1200	120	HL EM	ACUITY LITHONIA WST LED SIGNIFY GARDCO 101L RAYON T632LED

LIGHTING SEQUENCE OF OPERATION

NOTES:
1. {L##} DENOTES THE LIGHTING SEQUENCE OF OPERATIONS FOR THIS SPACE.

PLAN ID	LIGHTING SWITCHED
{LS1}	Sequence: Lighting control provides occupancy control, manual switching, HVAC control in this space. ON: Lights turn on via occupancy sensor. OFF: Lights automatically turn off after the space has been vacant for 15 minutes. Night lights (NL) remain on. HVAC CONTROL: Exhaust fan is turned on with lights and turned off after the space has been vacant for 15 minutes. EMERGENCY: The emergency lights are controlled the same as normal lights. When normal power fails the switched emergency lights turn on; 100% full output. Local lighting control is resumed when normal power restored
{LS2}	Sequence: Lighting control provides vacancycontrol, photocell, and emergency lighting control in this space. ON: Site building mounted lights turn on using photocell. ADJUST: Site building mounted lights lower to 50% after the space has been vacant for 15 minutes. Lights return to 100% with occupancy detection. OFF: Site building mounted lights are turned off using photocell.

ELECTRICAL SYMBOL LIST

SYMBOL:	SPEC TAG:	SPEC SECTION:	DESCRIPTION:
S ##	SW-1P SW-3W SW-O2	26 09 33	SWITCH SUBSCRIPTS: BLANK = SINGLE POLE 3 = THREE WAY O2= DUAL TECHNOLOGY OCCUPANCY SENSOR WITH DUAL SWITCH
OC ##	SW-OC-D SW-OC-U	26 09 33	OCCUPANCY SENSOR - CEILING MOUNTED SUBSCRIPTS: BLANK = DUAL TECHNOLOGY U = ULTRASONIC - 360° COVERAGE

LUMINAIRE CIRCUIT AND CONTROL KEY

LUMINAIRE

F1 = FIXTURE TAG
1 = CIRCUIT NUMBER
"SE" INDICATES LUMINAIRE IS UNSWITCHED FOR NIGHT LIGHT.
"SE" INDICATES LUMINAIRE IS SWITCHED/CONTROLLED DURING NORMAL OPERATION AND OPERATES FROM EMERGENCY BATTERY (EXTEND UNSWITCHED CIRCUIT LEG TO BATTERY) UPON LOSS OF POWER.

*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: F1 / 1 / a / NL

LIGHTING SYSTEM DESCRIPTION KEY:

THE DESIGN DOCUMENTS DESCRIBE THE OPERATIONAL PERFORMANCE REQUIREMENTS OF THE LIGHTING CONTROL SYSTEM. THE PROJECT MAY REQUIRE ONE OR MORE LIGHTING CONTROL STRATEGIES FOR THE PROJECT. REFER TO THE ELECTRICAL SYMBOL KEY, SPECIFICATION SECTION 26 09 33 LIGHTING CONTROL SYSTEMS, AND THE DRAWINGS TO DETERMINE THE DESIGN APPLICATION FOR EACH SPACE. THE POTENTIAL STRATEGIES ARE AS FOLLOWS:

1. STANDALONE LIGHTING CONTROL DEVICES: INDEPENDENT (STANDALONE) DEVICES TRADITIONALLY OPERATING AT LINE OR LOW VOLTAGE, FIELD CONFIGURABLE WITH OTHER STANDALONE DEVICES TO PROVIDE AN OVERALL LIGHTING CONTROL SYSTEM.

LIGHTING CONTROL SYSTEM DESIGNATION: THE FOLLOWING KEY MAY BE USED AS AN EXAMPLE TO DETERMINE THE DESIGNATED LIGHTING CONTROL SYSTEM FOR EACH SPACE. REFER TO ELECTRICAL COVERSHEET FOR ELECTRICAL SYMBOLS LIST AND DEVICE SPECIFICATION TAG. REFER TO THE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

1. STANDALONE LIGHTING CONTROL DEVICES: CONTROL STATION COMMONLY DEFINED BY AN ALPHA CHARACTER WITH SUBSCRIPTS.

A. EXAMPLE SYMBOL "S", SPECIFICATION TAG "SW-1P", DESCRIPTION "SWITCH- SINGLE POLE SWITCH".
B. EXAMPLE CONTROL DESIGNATION: a, b, c (WHEN REQUIRED TO CLARIFY DESIGN INTENT).
C. SINGLE POLE LIGHT SWITCH "sa" CONTROLS LUMAIRES WITH THE SUBSCRIPT "a" WITHIN THE SAME SPACE.
D. REFER TO THE LIGHT CONTROL SEQUENCE OF OPERATION TAG ({L##}) FOR A COMPLETE DESCRIPTION OF THE LIGHTING CONTROL REQUIREMENTS.

F#
a

LUMINAIRE

a
S

CONTROL

LIGHTING CONTROL NOTES:

LIGHTING CONTROL NOTES:

{L##} INDICATES THE LIGHTING SEQUENCE OF OPERATION FOR THE SPACE. REFER TO THE LIGHTING SEQUENCE OF OPERATION MATRIX ON SHEET E0.01.

LIGHTING CONTROL SUBSCRIPTS:

1. LOWER CASE ALPHA SUBSCRIPTS "a, b, c" INDICATE LINE VOLTAGE OR ROOM BASED LIGHTING CONTROL SYSTEMS. REFER TO DRAWINGS TO DETERMINE IF LINE VOLTAGE CONTROL (S, S3, S4, ETC) OR {#B} ROOM BASED CONTROLLER SYSTEM {#B} IS REQUIRED.

EMERGENCY LIGHTING OVERRIDE CONTROL (UL924 AND UL1008): LIGHTING CONTROL EQUIPMENT COUPLED WITH REMOTE EMERGENCY POWER SOURCES (EXTERNAL TO THE LUMINAIRE) REQUIRE ALCR (UL924) OR BCELTS (UL1008) DEVICES FOR EMERGENCY (LIFE SAFETY) COMPLIANCE. AN EMERGENCY LIGHTING CONTROL BYPASS IS REQUIRED FOR EVERY INDIVIDUAL LIGHTING CONTROL ZONE-CIRCUIT BUT NOT SHOWN ON THE PLANS. REFER TO THIS SPECIFICATION FOR ALCR AND BCELTS DESCRIPTIONS. REFER TO THE SEQUENCE OF OPERATION LIGHTING CONTROL DESCRIPTIONS ON THE PLANS FOR ADDITIONAL REQUIREMENTS.

REFER TO SHEET E0.01 FOR LUMINAIRE SCHEDULE

623 28TH AVENUE
ROCK ISLAND, IL 61201
P. 309.786.0673 F. 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

01234

REF. SCALE IN INCHES

PROJECT #24001440.00

PHASE

☐ PRELIM

☐ PERMIT

☐ FINAL

☒ BID

☐ CONST

☐

WHA No.

1854D23

DATE

10/21/24

SHEET

No.

E0.01

REMARKS

BY

DATE

REV.

DESIGNED

JERRET

CHECKER

GAUSHA

WILLETT HOFMANN & ASSOCIATES, INC.

ENGINEERING ARCHITECTURE LAND SURVEYING

623 32ND AVE SW CEDAR RAPIDS, IA 52404

1-319-776-1401

ROCK ISLAND CO MILAN FACILITY

851 10TH AVE W, MILAN, IL 61264

ELECTRICAL LIGHTING COVERSHEET

This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright

Willett, Hofmann & Associates, Inc.

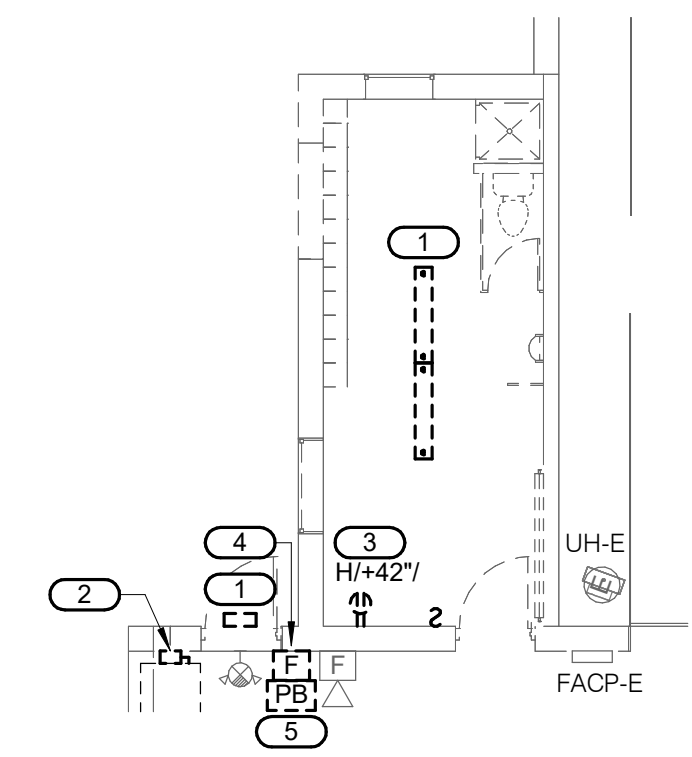
WYCAR



1

LEVEL 1 DEMOLITION PLAN - ELECTRICAL

1/8" = 1'-0"



KEYNOTES

- 1 SALVAGE AND MAINTAIN LIGHTING CIRCUIT FOR EXTENSION AND CONNECTION TO NEW LIGHT FIXTURES.
- 2 REMOVE AND SALVAGE DISCONNECT SWITCH FOR REINSTALLATION. SALVAGE AND MAINTAIN CIRCUIT FOR EXTENSION AND CONNECTION TO RELOCATED DISCONNECT SWITCH.
- 3 SALVAGE AND MAINTAIN RECEPTACLE CIRCUIT FOR EXTENSION AND CONNECTION TO NEW RECEPTACLES.
- 4 SALVAGE FIRE ALARM PULL STATION FOR REINSTALLATION. SALVAGE AND MAINTAIN CIRCUIT FOR EXTENSION AND CONNECTION TO RELOCATED DEVICE.
- 5 REMOVE PUSHBUTTON STATION FOR EXTERIOR GATE CONTROL. SALVAGE PUSHBUTTON STATION FOR REINSTALLATION. CONDUIT AND WIRING TO BE REVISED/EXTENDED TO NEW LOCATION.
- 6 INSTALL PUSHBUTTON STATION SALVAGED FROM DEMOLITION. REVISE/EXTEND CONDUIT AND WIRING TO NEW LOCATION. PROVIDE ADDITIONAL CONDUIT AND WIRE (#12 IN 3/4" CONDUIT) AS REQUIRED. CONDUIT AND WIRE CURRENTLY GOES THROUGH WALL BEHIND PUSHBUTTON AND DOWN EXTERIOR WALL TO BELOW GRADE.
- 7 EXTEND EXISTING FIRE ALARM NOTIFICATION APPLIANCES CIRCUIT TO NEW FIRE ALARM NOTIFICATION DEVICES.
- 8 REINSTALL FIRE ALARM PULL STATION SALVAGED FROM DEMOLITION. EXTEND FIRE ALARM SIGNAL CIRCUIT SALVAGED FROM DEMOLITION TO RELOCATED DEVICE.
- 9 EF-1 TO BE LOCATED ON ROOF.
- 10 RACEWAY SYSTEMS SHALL BE SURFACE MOUNTED CONDUIT IN THIS SPACE.
- 11 REINSTALL DISCONNECT SALVAGED FROM DEMOLITION. EXTEND EXISTING CONDUIT AND WIRE TO NEW LOCATION OF DISCONNECT. MATCH EXISTING CONDUIT AND WIRE.

DESIGNED		REV.	DATE	BY	REMARKS
JERRET	CHECKER				
GAUSHA	CHECKER				

WILLETT HOFMANN
& ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SERVING
622 32ND AVE SW CEDAR RAPIDS, IA 52404
319-776-1401



WYEM

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264
LEVEL 1 PLAN - ELECTRICAL - MAINT

PHASE

- ☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

DATE
10/21/24

SHEET
No.
E1.01

IMEG
www.imegcorp.com
623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.788.0673 F: 309.786.5967

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

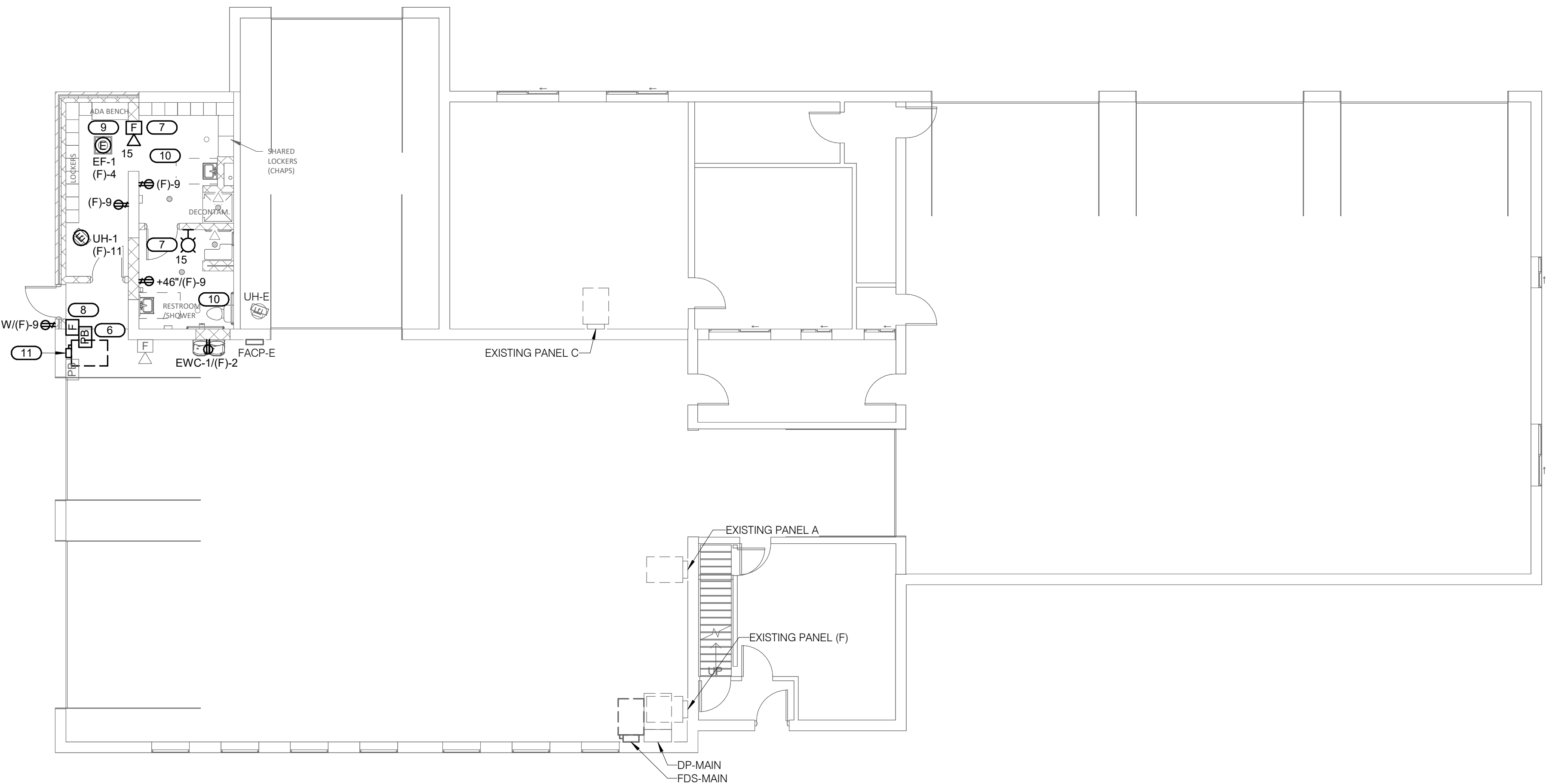
0 1 2 3
REF. SCALE IN INCHES PROJECT #24001440.00



2

LEVEL 1 PLAN - ELECTRICAL

1/8" = 1'-0"

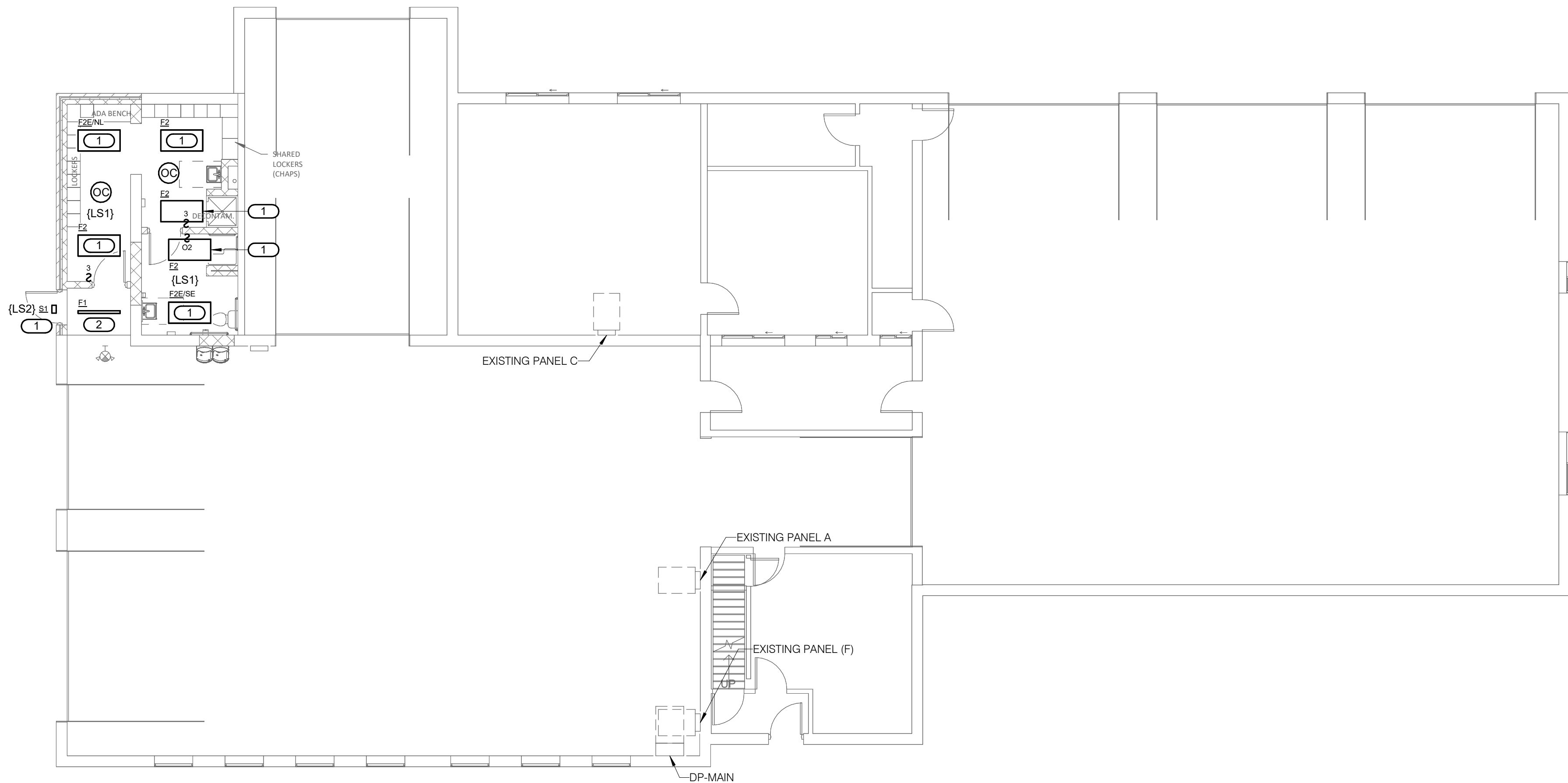




1

LEVEL 1 PLAN - LIGHTING

1/8" = 1'-0"



KEYNOTES

- 1 UTILIZE LIGHTING CIRCUIT SALVAGED FROM DEMOLITION TO FEED NEW FIXTURES. PROVIDE ADDITIONAL CONDUIT AND WIRE (2#12 & 1#12 EGC IN 3/4" CONDUIT) AS REQUIRED.
- 2 EXTEND LIGHTING CIRCUIT FROM REPAIR SHOP TO NEW FIXTURE VIA 2#12 & 1#12 EGC IN 3/4" CONDUIT. NEW FIXTURE TO BE CONTROLLED WITH THE REST OF THE REPAIR SHOP LIGHTING.



623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

0 1 2 3
REF. SCALE IN INCHES PROJECT #24001440.00

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264
LEVEL 1 PLAN - LIGHTING - MAINT

PHASE

- ☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

DATE
10/21/24

SHEET
No.
E1.03



WILLETT HOFMANN
& ASSOCIATES
ENGINEERING ARCHITECTURE LAND SERVING
622 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.276.1401

REMARKS

BY

DATE

REV.

DESIGNED

JERVET

CHECKER

GAUSHA

ELECTRICAL CONNECTION SCHEDULE

	ITEM	LOCATION	VOLTAGE	LOAD CLASS.	MOTOR	MOTORS				ELECTRIC HEATING ELEMENT (KW)	APPARENT LOAD	FLA	MCA	MOCP	OCPD	REQ EMER	CIRCUIT NUMBER	WIRE AND RACEWAY	ISC	SCCR	DISCONNECT		CONTROLLER / STARTER		COMMENTS						
						QTY @	HP	QTY @	HP												QTY @	HP	BY	TYPE		BY	TYPE				
(F)	EF-1		120, 1Ø	HVAC	Yes	1	@	0.25	0	-	0	0	-	0	0	0	0.70 kVA	5.8	7.3	15	20	No	4	2#12 & 1#12 EGC IN 3/4" C.	0	5,000	MFR	NF	MFR	ECM	
	UH-1		120, 1Ø	HVAC Heating Only	Yes	1	@	0.07	0	-	0	0	-	0	0	0	0.53 kVA	4.4	5.5	15	20	No	11	2#12 & 1#12 EGC IN 3/4" C.	0	5,000	MFR	NF	MFR	FV	

EXISTING PANEL (F)

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 60/3P FU @ DP-MAIN
LOCATION:

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 100 MLO
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: EXISTING
ISC UNKNOWN 0.00 kA

NOTES: PANEL IS GE POWERMARK LOAD CENTER. ALL CIRCUITS ARE EXISTING TO REMAIN UNLESS NOTED OTHERWISE.

KEY	CKT NO.	LOAD DESCRIPTION	OCPD		WIRE SIZE		VD %	A	B	C	VD %	WIRE SIZE		OCPD	LOAD DESCRIPTION	CKT NO.	KEY		
			AMPS	P	H	N						G	H					N	
	1	EXISTING	20	1	--	--		0	1			2.49	12	12	1	20	Receptacles, EWC-1	2	*G
	3	EXISTING	20	1	--	--			0	0.7		2.55	12	12	1	20	HVAC, EF-1	4	*NB
	5	EXISTING	20	1	--	--				0	--		--	--	1	--	SPACE	6	--
	7	EXISTING	20	1	--	--		0	--				--	--	1	--	SPACE	8	--
*EB	9	Receptacles	20	1	12	12	12	2.08		0.72	--		--	--	1	--	SPACE	10	--
*EB	11	HVAC Heating Only, UH-1	20	1	12	12	12	1.57			0.53	--		--	1	--	SPACE	12	--
Total Load:								1.00 kVA	1.42 kVA	0.53 kVA									
Total Amps:								8.94	12.41	4.40									

LOAD SUMMARY				TOTALS*	
LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND		
HVAC	0.696 kVA	100.00%	0.696 kVA	TOTAL CONNECTED LOAD:	2.94 kVA
HVAC Heating Only	0.528 kVA	100.00%	0.528 kVA	TOTAL ESTIMATED DEMAND LOAD:	2.944 kVA
Receptacles	1.72 kVA	100.00%	1.72 kVA	TOTAL CONNECTED AMPS:	8.17 A
				TOTAL ESTIMATED DEMAND AMPS:	8.2

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.
CIRCUIT KEY NOTES: *NB = NEW BREAKER; *G = NEW GFCI BREAKER; *EB = EXISTING BREAKER W/ NEW LOAD



623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

0123

REF. SCALE IN INCHES

PROJECT #24001440.00

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

ELECTRICAL SCHEDULES

- PHASE
- ☐ PRELIM
- ☐ PERMIT
- ☐ FINAL
- ☒ BID
- ☐ CONST
- ☐

WHA No.
1854D23

DATE
10/21/24

SHEET
No.
E6.00

DESIGNED
JERVET

CHECKER

GAUSHA

WILLETT HOFMANN
& ASSOCIATES
ENGINEERING ARCHITECTURE LAND SERVING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.376.1401



Willet, Hofmann & Associates, Inc.

© Copyright

This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission.

VIEW KEY

NAME

LEVEL NAME

10'-0"

HEIGHT ABOVE PROJECT 0'-0"

1

KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL

INDICATES DIRECTION OF TRUE NORTH

PLAN OR DETAIL NUMBER

PLAN OR DETAIL NAME

1/8" = 1'-0"

PLAN OR DETAIL SCALE

VIEW NAME

1

INDICATES SIMILAR DETAIL REFERENCED IN MULTIPLE LOCATIONS

DETAIL REFERRED TO BY SECTION CUT

SHEET DETAIL IS LOCATED ON

SIM

M101

T101

LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
NEW
----- EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
----- NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
EXISTING
----- EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
----- EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG-E TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

APPLICABLE CODES	
CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:	
BUILDING CODE:	IBC 2021 EDITION
FIRE CODE:	IFC 2021 EDITION
PLUMBING CODE:	ILLINOIS PLUMBING CODE 2014 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LIFE SAFETY CODE:	NFPA 101 CURRENT EDITION
ENERGY CONSERVATION CODE:	IECC 2021
HEALTH DEPARTMENT CODE:	CURRENT EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

CONTRACTOR ABBREVIATION KEY	
ABBR:	DESCRIPTION:
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
H.C.	HEATING CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
T.C.C.	TEMPERATURE CONTROLS CONTRACTOR
V.C.	VENTILATION CONTRACTOR

CONTACT PERSONS:	
DESCRIPTION:	PERSON:
PROJECT MANAGER	MATT SYNDER
MECHANICAL	ZACH MANARY
ELECTRICAL	JEREMY VETTING

PLUMBING SLOPE REQUIREMENTS:	
BASED ON ILLINOIS PLUMBING CODE	
INTERIOR: SANITARY WASTE:	≤2'-1/2" @ = 1/4" PER FOOT ≥3' @ = 1/8" PER FOOT ≥8' @ = 1/16" PER FOOT
CONDENSATE AND INDIRECT DRAINAGE:	1/8" PER FOOT
SANITARY VENT:	NO SPECIFIC PITCH, PITCH TO FIXTURES
DOMESTIC WATER:	NO SPECIFIC PITCH, PITCH TO FIXTURES

PLUMBING SYMBOL LIST	
NOT ALL SYMBOLS MAY APPLY.	
SYMBOL:	DESCRIPTION:
—CW—	COLD WATER - POTABLE
—D—	DRAIN
—HW—	HOT WATER - POTABLE
—HWC—	HOT WATER CIRCULATING - POTABLE
—SAN—	SANITARY DRAINAGE
—V—	VENT
	PIPE CONTINUATION
	PIPE CAP
	PIPE DOWN
	PIPE UP OR UP/DOWN
	PIPE SERVING FIXTURE ON FLOOR ABOVE (EXAMPLE: FD = FLOOR DRAIN)
	PITCH PIPE IN DIRECTION
	DIRECTION OF FLOW IN PIPE
	ROUTE TO DRAIN
	DIELECTRIC CONNECTION
	UNION/FLANGE
	SHUTOFF VALVE NORMALLY OPEN
	SHUTOFF VALVE NORMALLY CLOSED
	BALANCING VALVE (NUMBER INDICATES GPM)
	CHECK VALVE
	VACUUM BREAKER
	PRESSURE GAUGE (FURNISHED WITH BALL VALVE)
	THERMOMETER WITH WELL (FILLED TYPE)
	REDUCER - REFERENCE SPECIFICATION FOR CONCENTRIC/ECCENTRIC AND FOT/F08

MECHANICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING, VENTILATION, PIPING, AND TEMPERATURE CONTROL.

- EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE BEGINNING WORK.
- NOT ALL EXISTING DUCTWORK AND PIPING IS SHOWN. VERIFY EXISTING CONDITIONS BEFORE STARTING WORK. NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.
- FIELD VERIFY THE AVAILABLE CLEARANCES FOR DUCTWORK AND PIPING BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
- EACH CONTRACTOR SHALL CUT AND PATCH ROOFS, WALLS, AND FLOORS ASSOCIATED WITH THEIR WORK.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF CEILINGS, CEILING TILES, AND CEILING GRIDS ASSOCIATED WITH AREAS OF WORK BY ALL CONTRACTORS. NOTIFY THE GENERAL CONTRACTOR OF AFFECTED AREAS PRIOR TO BIDDING.
- WHERE EXISTING MECHANICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, PIPING, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING MECHANICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.
- PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS THAT REMAIN ACTIVE.
- OBTAIN PERMISSION FROM OWNER BEFORE SHUTTING DOWN ANY SYSTEM FOR ANY REASON. MAINTAIN SERVICE TO ALL COMPONENTS THAT ARE TO REMAIN UNTIL NEW SYSTEMS ARE INSTALLED.
- MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR TIE IN AND SWITCHOVER. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM OWNER BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MAKE CHANGEOVER TO NEW SYSTEMS WITH MINIMUM OUTAGE.
- DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED.

PLUMBING SHEET INDEX	
P0.00	PLUMBING COVERSHEET
P1.00	UNDERFLOOR PLANS - PLUMBING - MAINT
P1.00A	UNDERFLOOR PLANS - PLUMBING - ADMIN
P1.01	LEVEL 1 PLANS - PLUMBING - MAINT
P1.01A	LEVEL 1 PLANS - PLUMBING - ADMIN
P1.02	LEVEL 2 PLANS - PLUMBING - MAINT
P3.00	PLUMBING ENLARGED PLANS
P3.01	PLUMBING ENLARGED PLANS
P3.02	PLUMBING ENLARGED PLANS
P4.00	PLUMBING DETAILS
P6.00	PLUMBING SCHEDULES
GRAND TOTAL: 11	

PLUMBING ABBREVIATION KEY	
ABBR:	DESCRIPTION:
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
BT	BATHTUB
CO	CLEANOUT
DN	DOWN
E	EXISTING
EWC	ELECTRIC WATER COOLER
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
HB	HOSE BIBB
I.E.	INVERT ELEVATION (FOR REFERENCE ONLY)
L or LAV	LAVATORY
MV	MIXING VALVE
NIC	NOT IN CONTRACT
SCCR	SHORT CIRCUIT CURRENT RATING
SH	SHOWER
SK	SINK
TYP	TYPICAL
UR	URINAL
VTR	VENT THROUGH ROOF
WC	WATER CLOSET
WCO	WALL CLEANOUT
WF	WASH FOUNTAIN
UON	UNLESS OTHERWISE NOTED
YCO	YARD CLEANOUT

PLUMBING GENERAL NOTES:

- THE SYMBOLS AND THE MATERIAL LIST ARE FOR THE CONVENIENCE OF THE CONTRACTOR. CONTRACTOR SHALL VERIFY QUANTITIES AND FURNISH ALL MATERIALS REQUIRED FOR FULLY OPERATIONAL SYSTEMS, WHETHER SPECIFIED OR NOT.
- CATALOG NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR A COMPLETE DESCRIPTION OF MATERIAL ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL TAKES PRECEDENCE OVER THE CATALOG NUMBER. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN.
- CONTRACTOR SHALL VERIFY THAT FIXTURES SUPPLIED ARE APPROVED PER ALL APPLICABLE STATE, LOCAL AND GOVERNING AUTHORITIES.
- ALL FIXTURES SHALL CONFORM TO FEDERAL ACT S.3874
- INVERT ELEVATIONS ARE FROM EXISTING DRAWINGS AND MAY NOT BE ACCURATE. VERIFY ALL ELEVATIONS BEFORE BEGINNING WORK.
- VERIFY UNDERGROUND PIPE SIZES, INVERT ELEVATIONS, AND LOCATIONS PRIOR TO BEGINNING ANY WORK.
- REFER TO THE PLUMBING ROUGH-IN SCHEDULE FOR THE SIZES OF BRANCH PIPES TO PLUMBING FIXTURES.
- EXISTING CONDITIONS ON DEMOLITION PLANS ARE PROVIDED TO INDICATE THE GENERAL SCOPE OF ITEMS TO BE REMOVED. REFER TO SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL DEMOLITION INFORMATION.
- P.C. SHALL CUT AND PATCH EXISTING AS REQUIRED FOR NEW OR DEMOLITION WORK UNLESS NOTED OTHERWISE. REFER TO SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL INFORMATION.

PLUMBING ROUGH-IN SCHEDULE

NOTES: (APPLIES TO ALL PLUMBING FIXTURES LISTED BELOW)
1) SIZES SHOWN ARE MINIMUMS. LARGER SIZES SHOWN ON THE DRAWING SHALL DICTATE THE ROUGH-IN SIZE. 2) SANITARY RISERS UP IN WALL TO FIXTURES SHALL BE A MINIMUM OF 2". 3) DOMESTIC WATER BRANCH PIPING OUTSIDE OF THE WALL/CHASE SHALL BE A MINIMUM OF 3/4" UNLESS NOTED OTHERWISE. ONLY THE FINAL RISE-DROP SHALL BE SMALLER. 4) FINAL SANITARY SIZE SHALL MATCH P-TRAP SIZE (REFER TO MATERIAL LIST).

TAG NAME	DESCRIPTION	COLD WATER	HOT WATER	SANITARY	VENT
EWC-1	ELECTRIC WATER COOLER (ACCESSIBLE)	1/2"	-	1 1/2"	1 1/2"
FD-1	FLOOR DRAIN	-	-	2"	1 1/2"
FD-2	FLOOR DRAIN	-	-	2"	1 1/2"
L-1	LAVATORY (ACCESSIBLE)	1/2"	1/2"	1 1/2"	1 1/2"
L-2	LAVATORY (ACCESSIBLE)	1/2"	1/2"	1 1/2"	1 1/2"
SH-1	SHOWER	1/2"	1/2"	2"	1 1/2"
SH-2	SHOWER	1/2"	1/2"	2"	1 1/2"
SH-3	BATH TUB / SHOWER	1/2"	1/2"	1 1/2"	1 1/2"
URFV-1	URINAL	3/4"	-	2	1 1/2"
WC-1	WATER CLOSET (ACCESSIBLE)	1/2"	-	4"	2"

The image contains two sets of diagrams illustrating ADA guidelines for accessible design. The left set, titled 'ADA GUIDELINES - FRONT ACCESS', shows a person in a wheelchair reaching for a fixture. It specifies a maximum reach of 20 inches, a maximum height of 48 inches, and a minimum clear width of 15 inches. The right set, titled 'ADA GUIDELINES - SIDE ACCESS', shows a person in a wheelchair reaching for a fixture from the side. It specifies a maximum reach of 20-25 inches, a maximum height of 44 inches, and a maximum clear width of 10-24 inches. Both sets show examples for installing a device above a counter, a device at 44 inches above finished floor, and a device at 18 inches above finished floor.

ADA STANDARDS FOR ACCESSIBLE DESIGN

MECHANICAL GENERAL NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING, VENTILATION, PIPING, AND TEMPERATURE CONTROL.

- DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT EXACT INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
- CATALOG AND MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE DESCRIPTION OF MATERIAL SCHEDULED ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL AND SCHEDULED PERFORMANCE TAKES PRECEDENCE OVER THE MODEL NUMBER. THE FIRST MANUFACTURER SCHEDULED IS THE BASIS OF DESIGN.
- DETERMINATION OF QUANTITIES OF MATERIAL AND EQUIPMENT REQUIRED SHALL BE MADE BY THE CONTRACTOR FROM THE DOCUMENTS. WHERE MATERIAL AND/OR QUANTITY DISCREPANCIES ARISE BETWEEN DRAWINGS, SCHEDULES AND/OR SPECIFICATIONS, THE HIGHER QUALITY/ GREATER NUMBER SHALL GOVERN.
- DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
- COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
- REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
- ANY CHANGES REQUIRED TO ELIMINATE CONFLICTS OR THAT RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO OTHERS.
- EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
- REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIOVISUAL, AND OTHER MECHANICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
- EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
- IN AREAS WITH DRYWALL CEILINGS COORDINATE LOCATIONS OF ACCESS PANELS WITH THE GC FOR ACCESS TO VALVES, DUCTWORK ACCESSORIES, DAMPERS, ETC. COORDINATE PANEL TYPE AND COLOR WITH ARCHITECT. NOTIFY THE GC OF THE REQUIRED ACCESS PANELS PRIOR TO BIDDING.
- SEAL ALL FLOOR, WALL, AND ROOF PENETRATIONS AIRTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE. PENETRATIONS THROUGH EXTERIOR WALLS AND ROOF SHALL BE SEALED AIRTIGHT WITH WATERPROOFING MATERIALS RECOMMENDED BY MANUFACTURER FOR OUTDOOR USE.
- CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALL, PARTITION, FLOOR, AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN ROOMS.
- WHERE PIPES AND DUCTS ARE SHOWN TO PENETRATE FLOORS, PROVIDE SLEEVED OPENINGS WITH THE TOP EDGE RAISED ABOVE FLOOR SURFACE IN ACCORDANCE WITH ALL RELEVANT SPEC SECTIONS. SEAL SLEEVE PERIMETER TO BE WATERTIGHT.
- EQUIPMENT SIZES AND SERVICE CLEARANCE REQUIREMENTS VARY AMONG DIFFERENT MANUFACTURERS. CONSULT APPROVED SHOP DRAWINGS FOR EQUIPMENT SIZES AND REQUIRED SERVICE CLEARANCES. COORDINATE WITH LAYOUT OF EQUIPMENT PADS, PIPING, DUCTWORK, ETC.
- DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
- MAINTAIN A MINIMUM WORKING CLEARANCE OF 3'-6" IN FRONT OF ALL ELECTRICAL EQUIPMENT REQUIRING MAINTENANCE, INSPECTION, AND TESTING INCLUDING BUT NOT LIMITED TO PANELS, DISTRIBUTION PANELS, SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, EQUIPMENT DISCONNECTS AND STARTERS.
- MAINTAIN THE DEDICATED ELECTRICAL EQUIPMENT SPACE DEFINED BY THE WIDTH / DEPTH OF ELECTRICAL EQUIPMENT MEASURED FROM THE FLOOR TO A HEIGHT 6'-0" ABOVE THE EQUIPMENT OR THE STRUCTURAL CEILING, WHICHEVER IS LOWER. SYSTEMS FOREIGN TO THE ELECTRICAL DISTRIBUTION SYSTEM ARE NOT ALLOWED IN THE DEDICATED ELECTRICAL SPACE INCLUDING DUCTWORK, PIPING, ETC.
- PROVIDE CONCRETE EQUIPMENT PAD FOR ALL FLOOR MOUNTED EQUIPMENT. PAD SHALL EXTEND MINIMUM 6" BEYOND ALL SIDES OF EQUIPMENT EXCEPT WHERE PAD EXTENSION WOULD INTERFERE WITH WORKING SPACE AT EQUIPMENT CONTROL PANELS AND ELECTRICAL PANELS.
- DO NOT EXCEED 25 LBS PER HANGER AND A MINIMUM SPACING OF 2'-0" ON CENTER WHEN ATTACHING TO METAL ROOF DECKING (LIMITATION NOT REQUIRED WITH CONCRETE ON METAL DECK). THIS 25 LBS. LOAD AND 2'-0" SPACING INCLUDE ADJACENT ELECTRICAL AND ARCHITECTURAL ITEMS HANGING FROM DECK. IF THE HANGER RESTRICTIONS CANNOT BE ACHIEVED, SUPPLEMENTAL FRAMING OFF STEEL FRAMING SHALL BE ADDED. ANCHORS EMBEDDED IN CONCRETE SHALL BE CRACKED CONCRETE APPROVED IN ACCORDANCE WITH SPECIFICATIONS.

IMEG

www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG. ©2024 IMEG CONSULTANTS CORP. Illinois Design Firm Registration #184008976-0014

623 28TH AVENUE
ROCK ISLAND, IL 61201
P. 309.786.0673 F. 309.786.5967

0 1 2 3
REF. SCALE IN INCHES PROJECT #24001440.00

REMARKS	DESIGNED	BY	DATE	REV.	DATE	REVISION
	ZACMAN					
	CHECKER					
	PETCOU					

WILLET HOFMANN & ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SERVING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.376.1401

WHA No.
1854023

DATE
10/21/24

SHEET
No.
P0.00

PLUMBING COVERSHEET

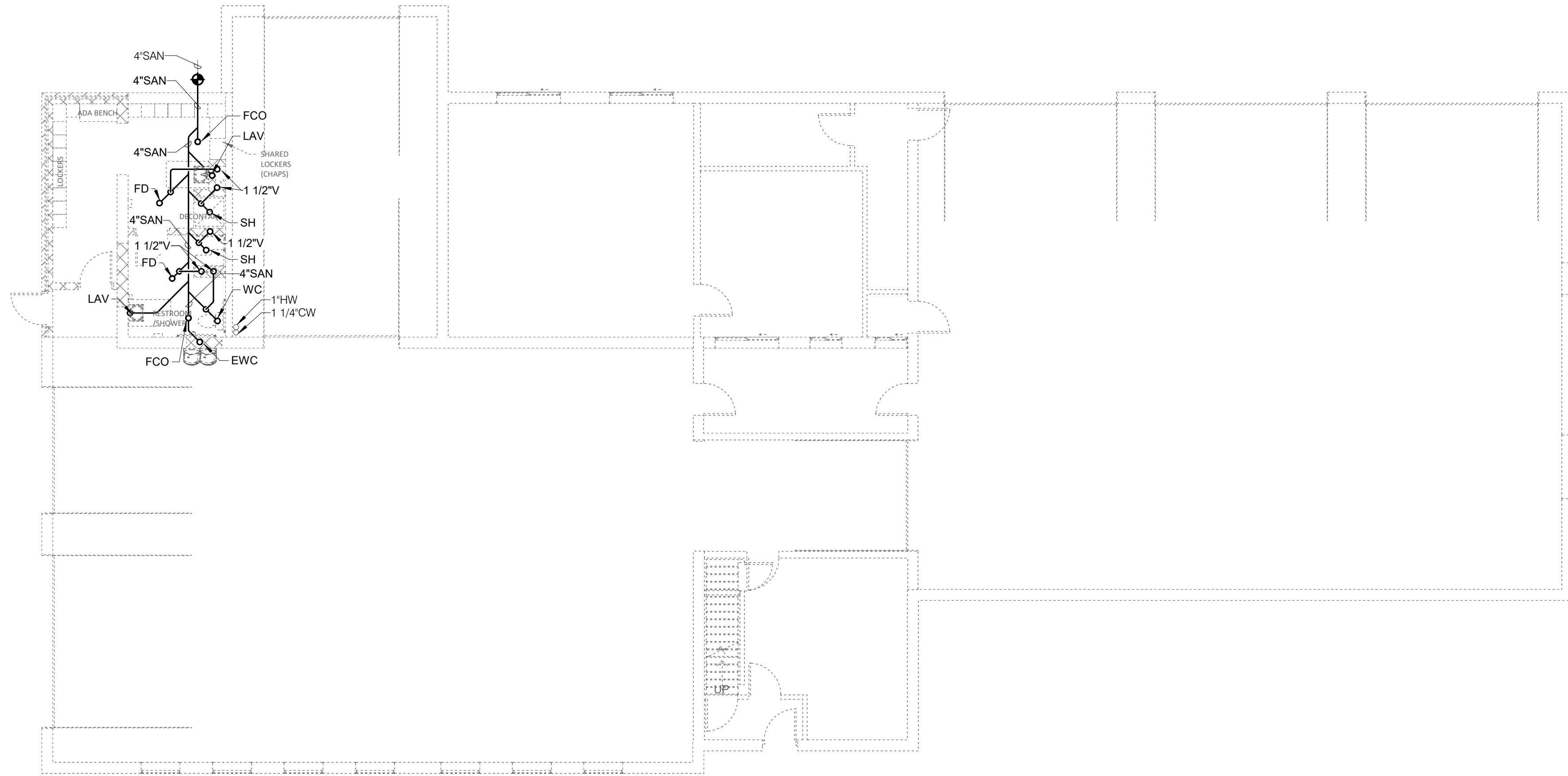
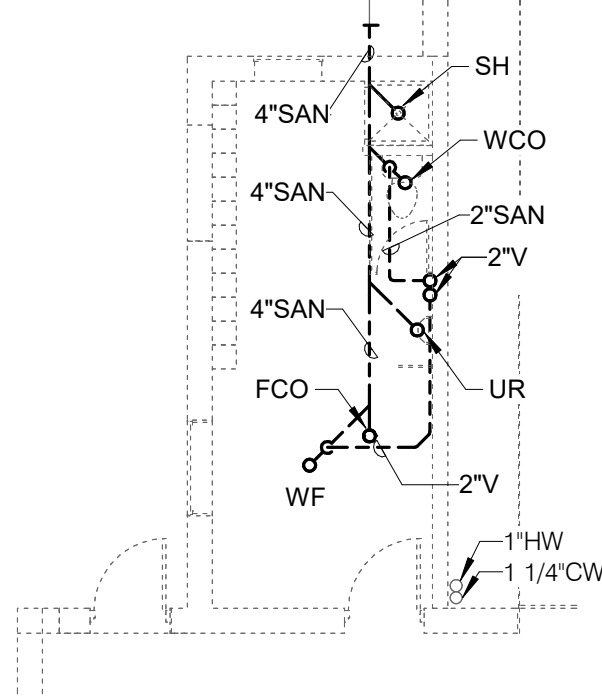
© Copyright Willett, Hofmann & Associates, Inc. and may not be copied or used by any person without written permission.



1

1/8" = 1'-0"

UNDERFLOOR DEMOLITION PLAN - PLUMBING - MAINTENANCE BUILDING



2

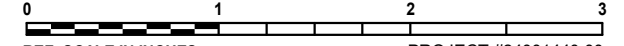
1/8" = 1'-0"

UNDERFLOOR PLAN - PLUMBING - MAINTENANCE BUILDING



623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014



REF. SCALE IN INCHES PROJECT #24001440.00

- PHASE
- ☐ PRELIM
 - ☐ PERMIT
 - ☐ FINAL
 - ☒ BID
 - ☐ CONST

WHA No.
1854D23

DATE
10/21/24

SHEET
No.
P1.00

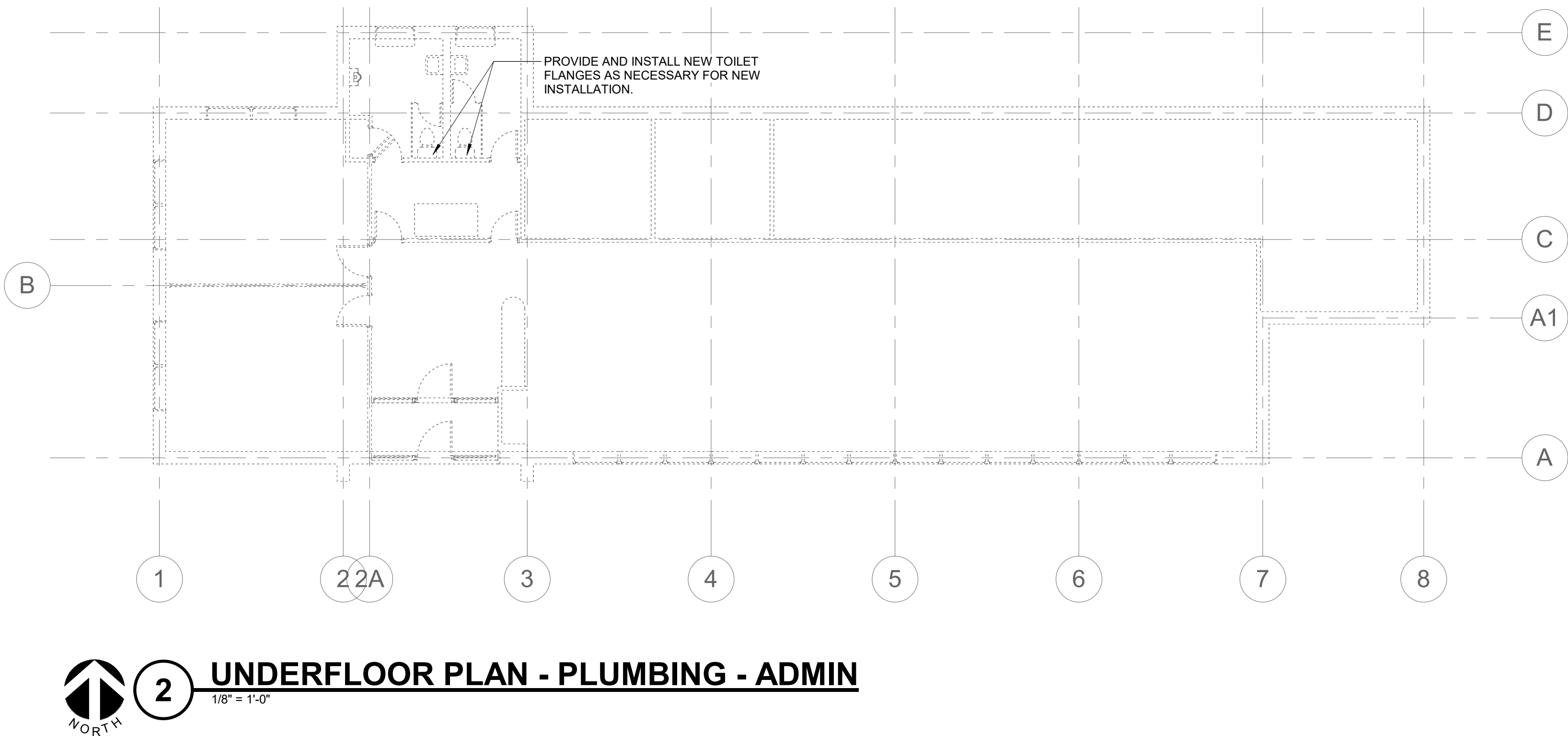
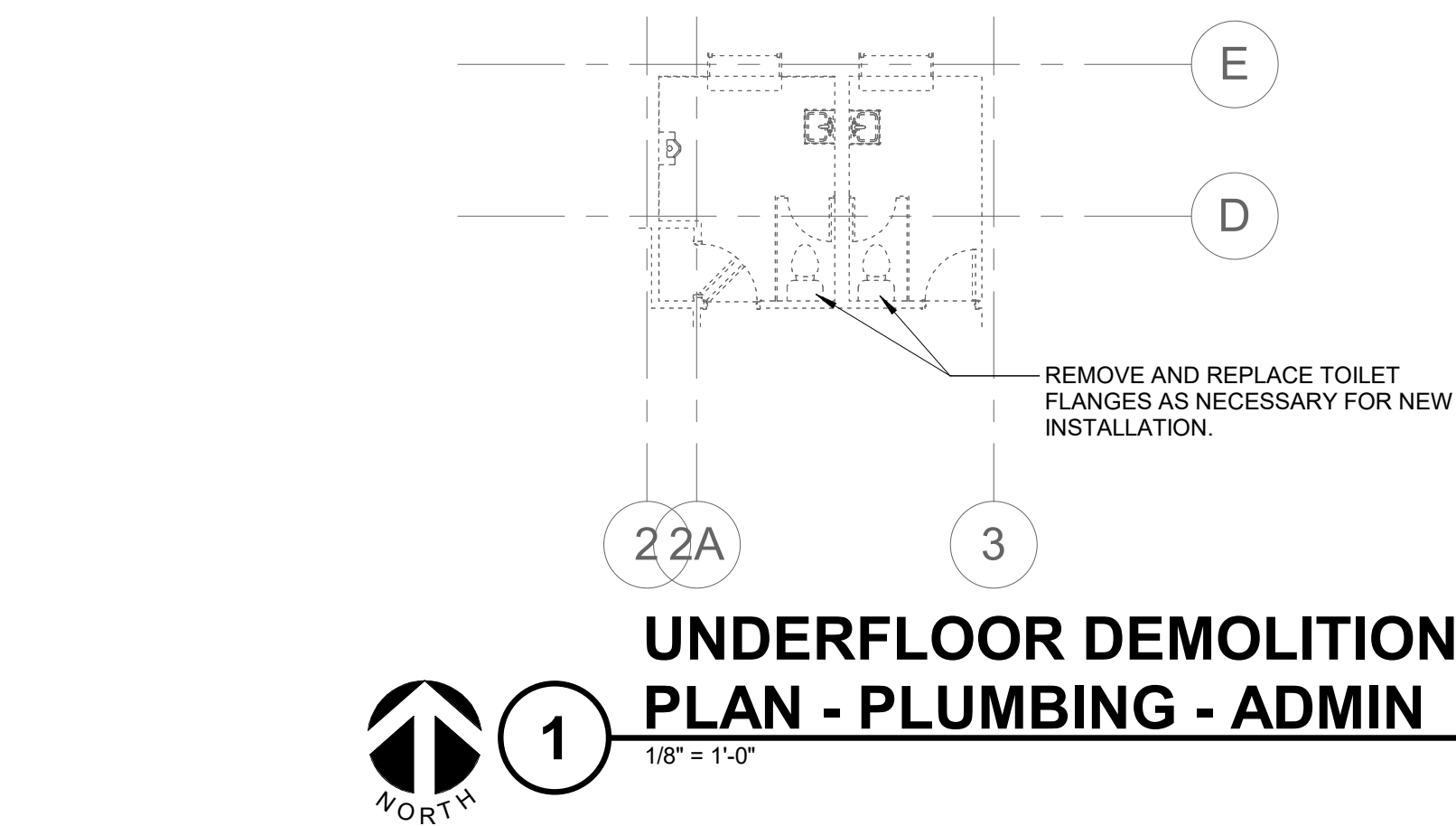
ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

UNDERFLOOR PLANS - PLUMBING - MAINT

WILLETT HOFMANN
& ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SERVING
622 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.276.1401



This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hofmann & Associates, Inc. WYEN





623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com

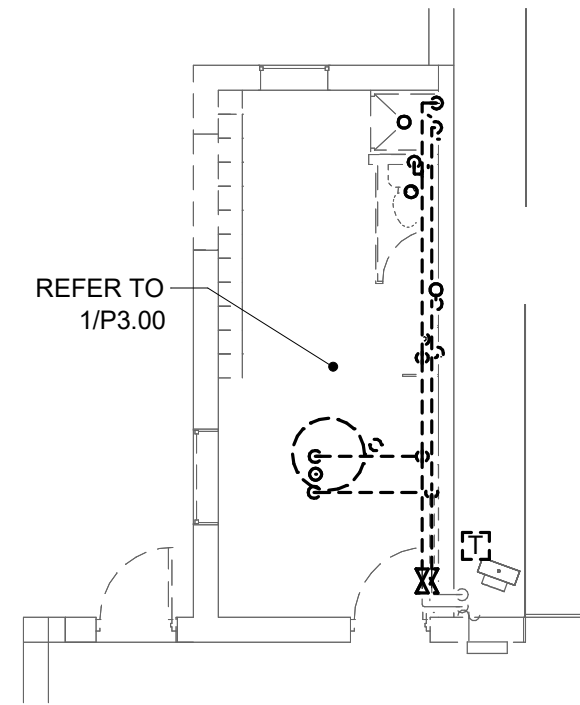
IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

0123

REF. SCALE IN INCHES

PROJECT #24001440.00

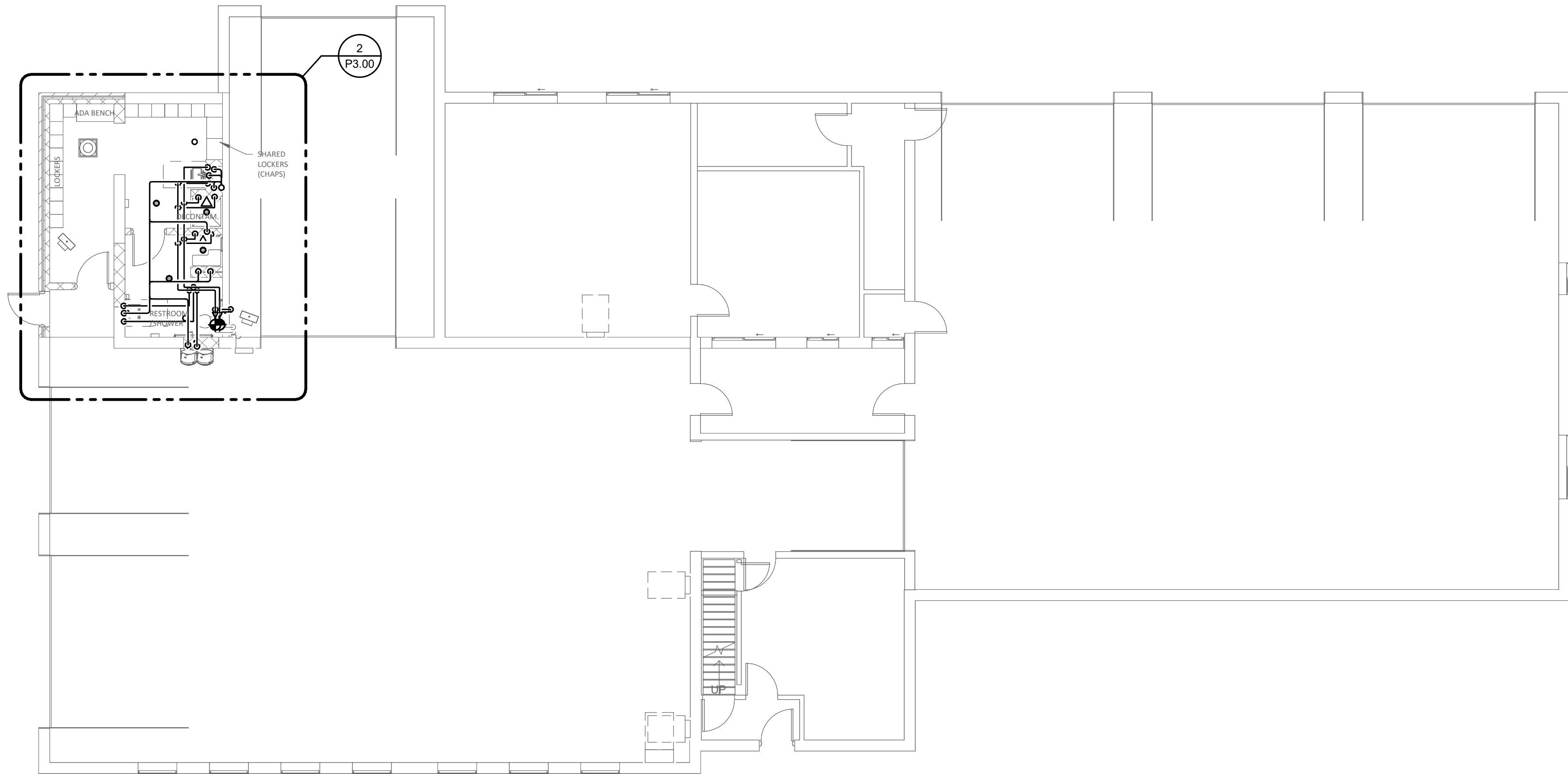
PHASE		DESIGNED		REV.	DATE	BY	REMARKS
☐ PRELIM		ZACMAN					
☐ PERMIT		CHECKER					
☒ FINAL		PETCOU					
☒ BID							
☐ CONST							
WHA No.	1854D23	WILLETT HOFMANN & ASSOCIATES, INC.		ENGINEERING / ARCHITECTURE / LAND SERVING			
DATE	10/21/24	623 28TH AVE SW CEDAR RAPIDS, IA 52404		1.319-276-1401			
SHEET No.	P1.00A	ROCK ISLAND CO MILAN FACILITY		851 10TH AVE W, MILAN, IL 61264			
		UNDERFLOOR PLANS - PLUMBING - ADMIN		Willelt, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright			



1

1/8" = 1'-0"

LEVEL 1 DEMOLITION PLAN -
PLUMBING - MAINTENANCE
BUILDING



2

1/8" = 1'-0"

LEVEL 1 PLAN - PLUMBING - MAINTENANCE BUILDING



623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

0 1 2 3

REF. SCALE IN INCHES PROJECT #24001440.00

- PHASE
- ☐ PRELIM
 - ☐ PERMIT
 - ☐ FINAL
 - ☒ BID
 - ☐ CONST

WHA No.
1854D23

DATE
10/21/24

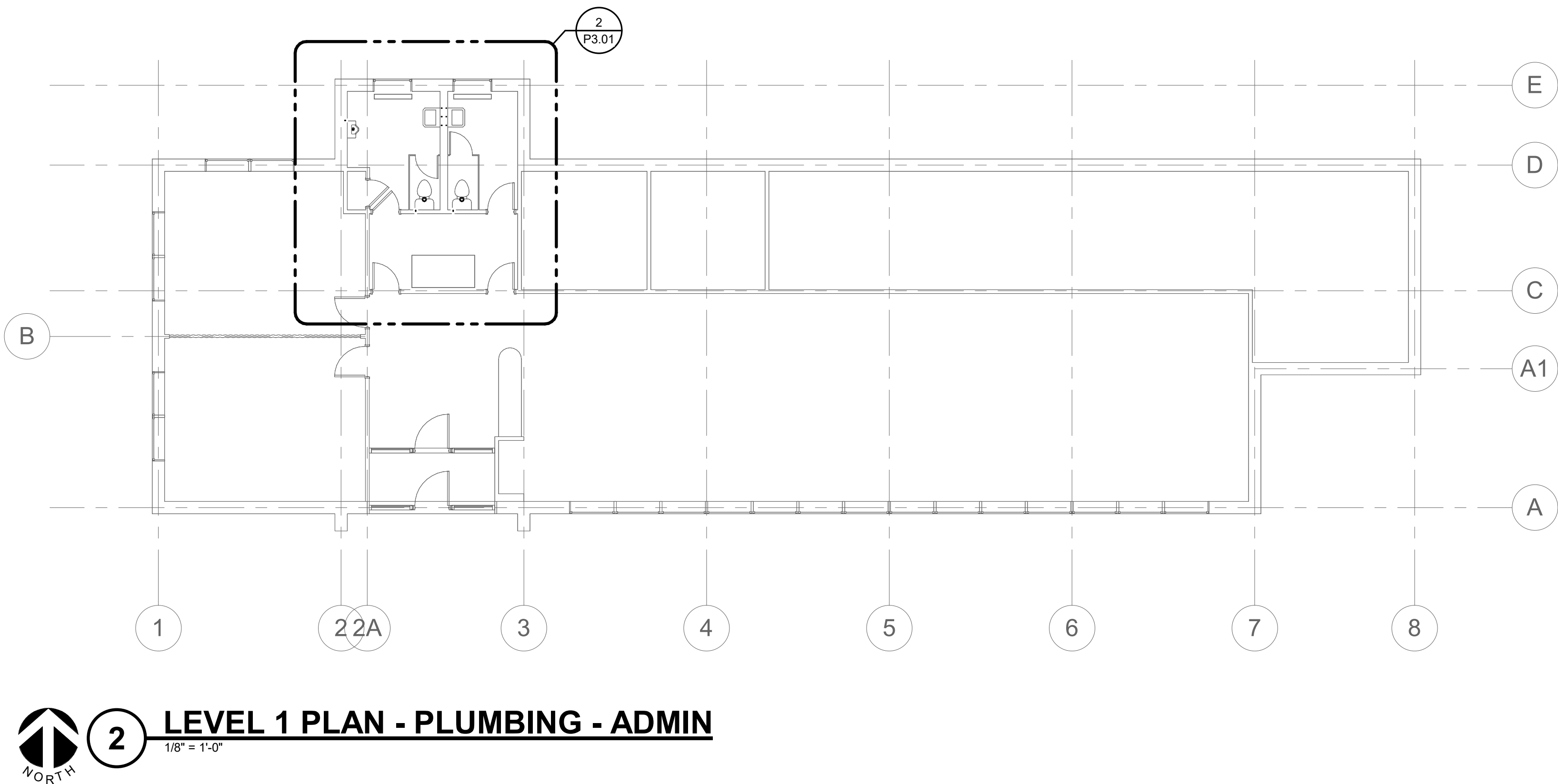
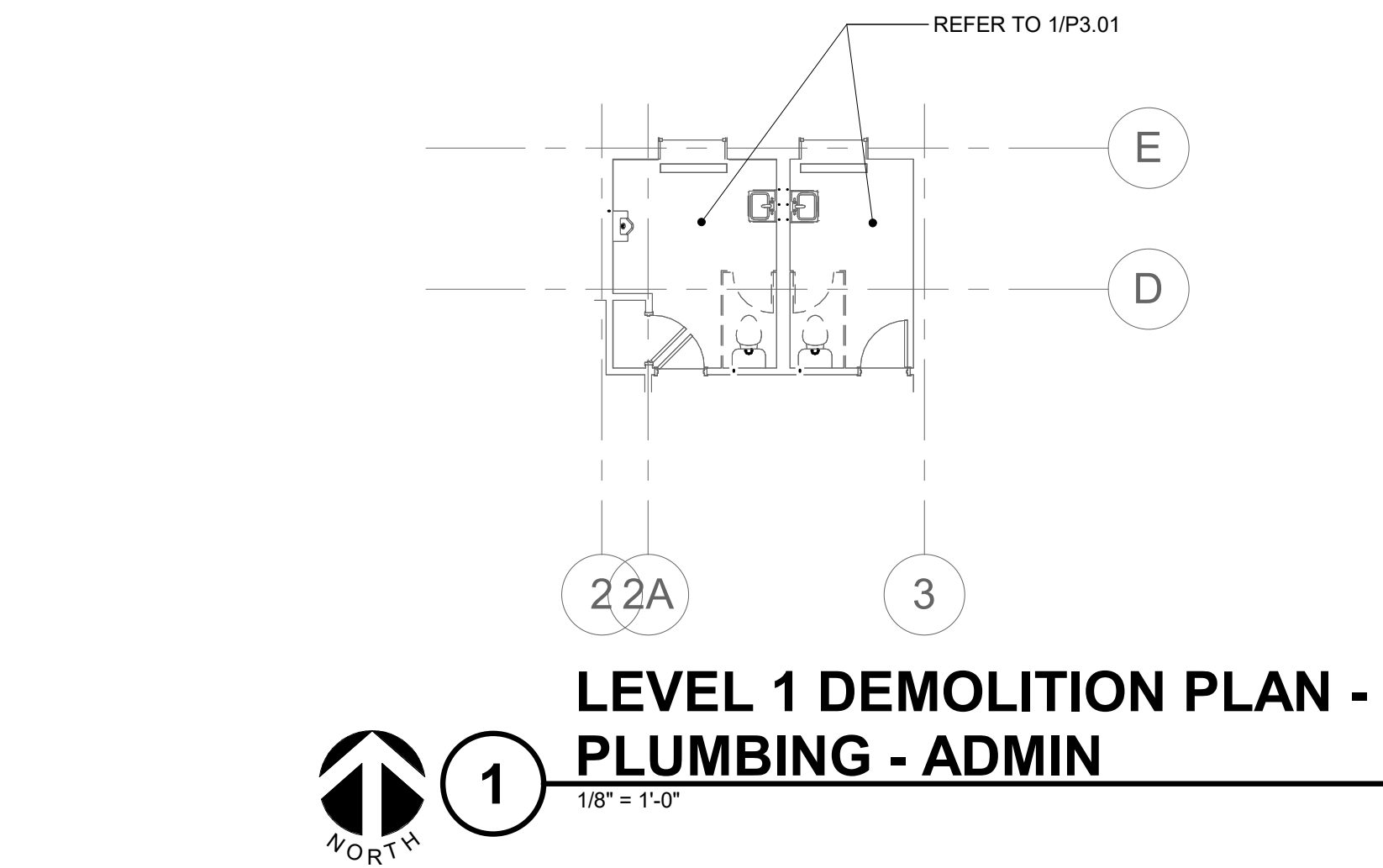
SHEET
No.
P1.01

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264
LEVEL 1 PLANS - PLUMBING - MAINT

WILLETT HOFMANN
& ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SERVING
622 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.276.1401



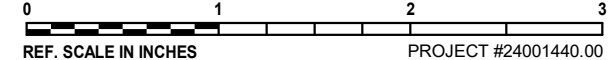
This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hofmann & Associates, Inc. WYEN





623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014



REF. SCALE IN INCHES
PROJECT #24001440.00

REVISIONS				REMARKS	
REV.	DATE	BY	DESIGNED		
			ZACMAN		
			CHECKER		
			PETCOU		



WILLETT HOFMANN
& ASSOCIATES
ENGINEERING ARCHITECTURE LAND SERVING
622 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.276.1401

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264
LEVEL 1 PLANS - PLUMBING - ADMIN

PHASE

☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.

1854D23

DATE

10/21/24

SHEET No.

P1.01A

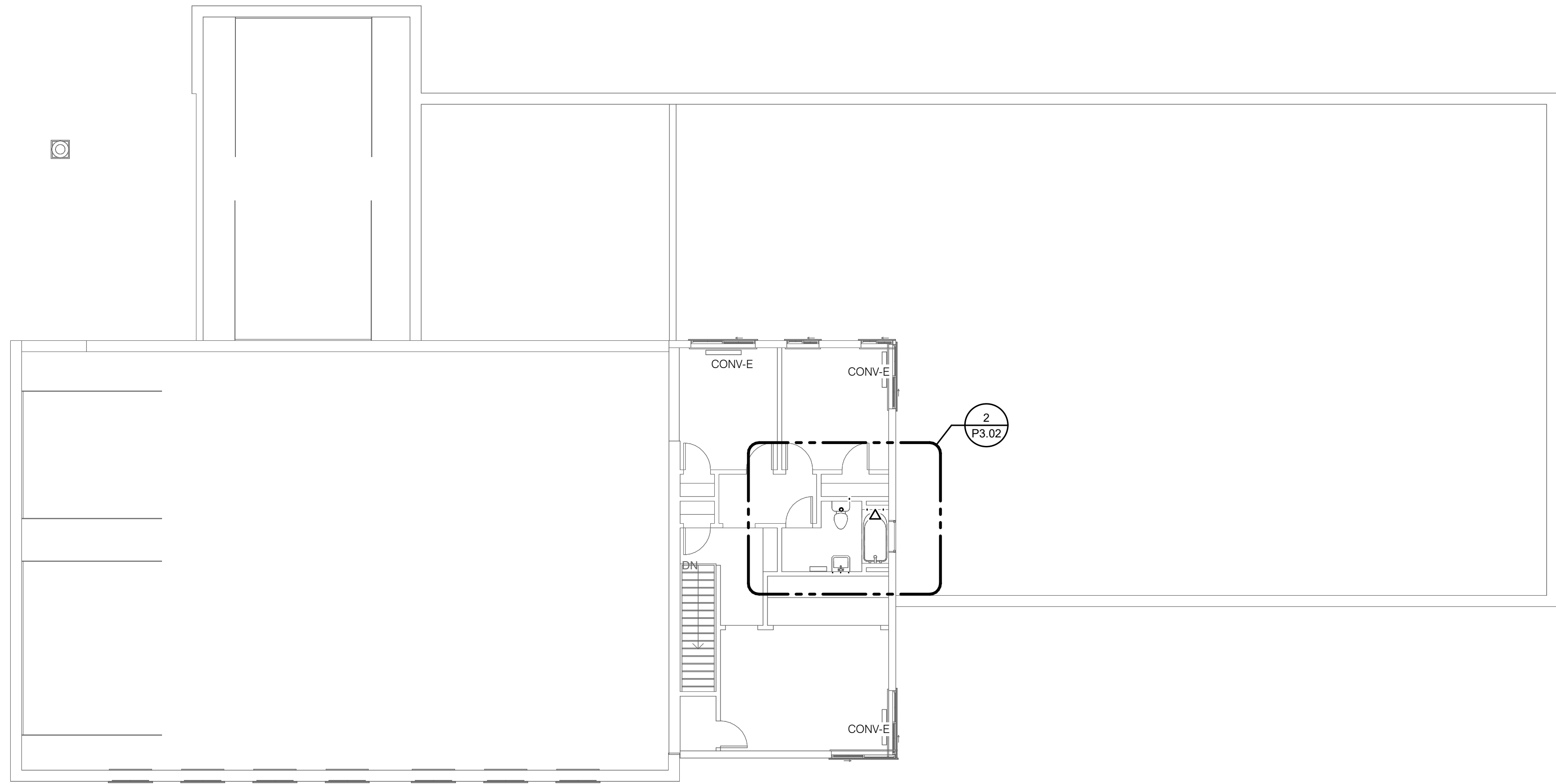
This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hofmann & Associates, Inc. WYEN



2

LEVEL 2 PLAN - PLUMBING - MAINTENANCE BUILDING

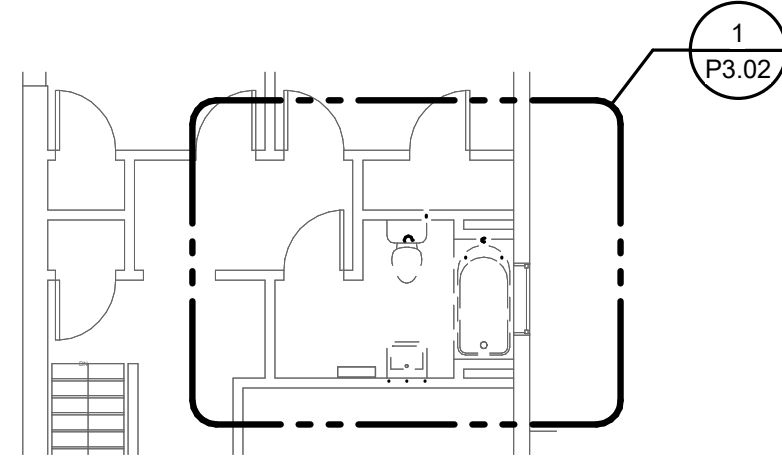
1/8" = 1'-0"



1

**LEVEL 2 DEMOLITION PLAN -
PLUMBING - MAINTENANCE
BUILDING**

1/8" = 1'-0"



IMEG 623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

0 1 2 3
REF. SCALE IN INCHES PROJECT #24001440.00

- PHASE**
- ☐ PRELIM
 - ☐ PERMIT
 - ☐ FINAL
 - ☒ BID
 - ☐ CONST
 - ☐

WHA No.
1854D23

DATE
10/21/24

**SHEET
No.**
P1.02

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264
LEVEL 2 PLANS - PLUMBING - MAINT



**WILLETT HOFMANN
& ASSOCIATES, INC.**
ENGINEERING ARCHITECTURE LAND SERVING
622 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.276.1401

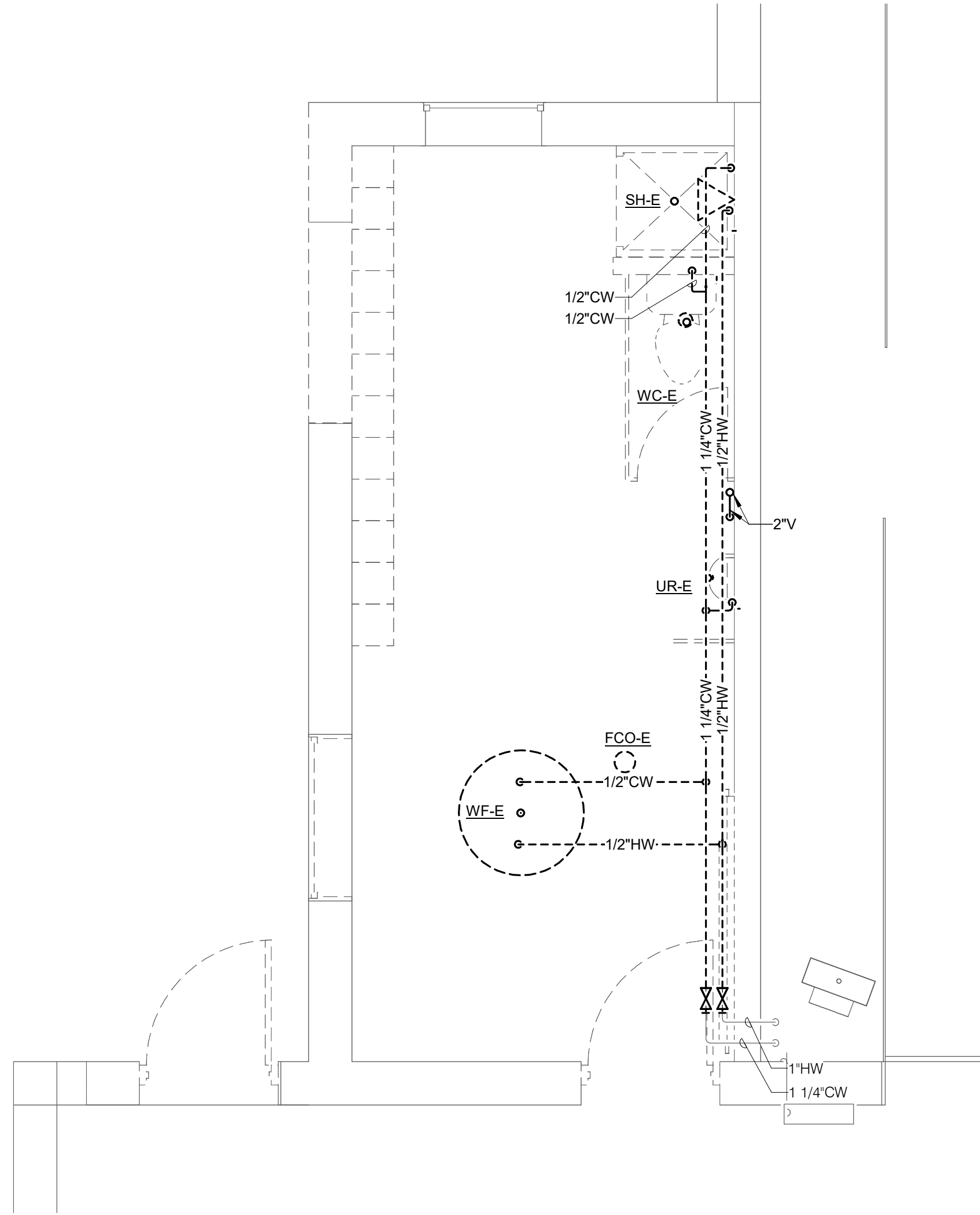
DESIGNED	REV.	DATE	BY	REMARKS
ZACMAN				
CHECKER				
PETCOU				



1

LEVEL 1 DEMOLITION PLAN - PLUMBING - RESTROOM / LOCKER ROOM

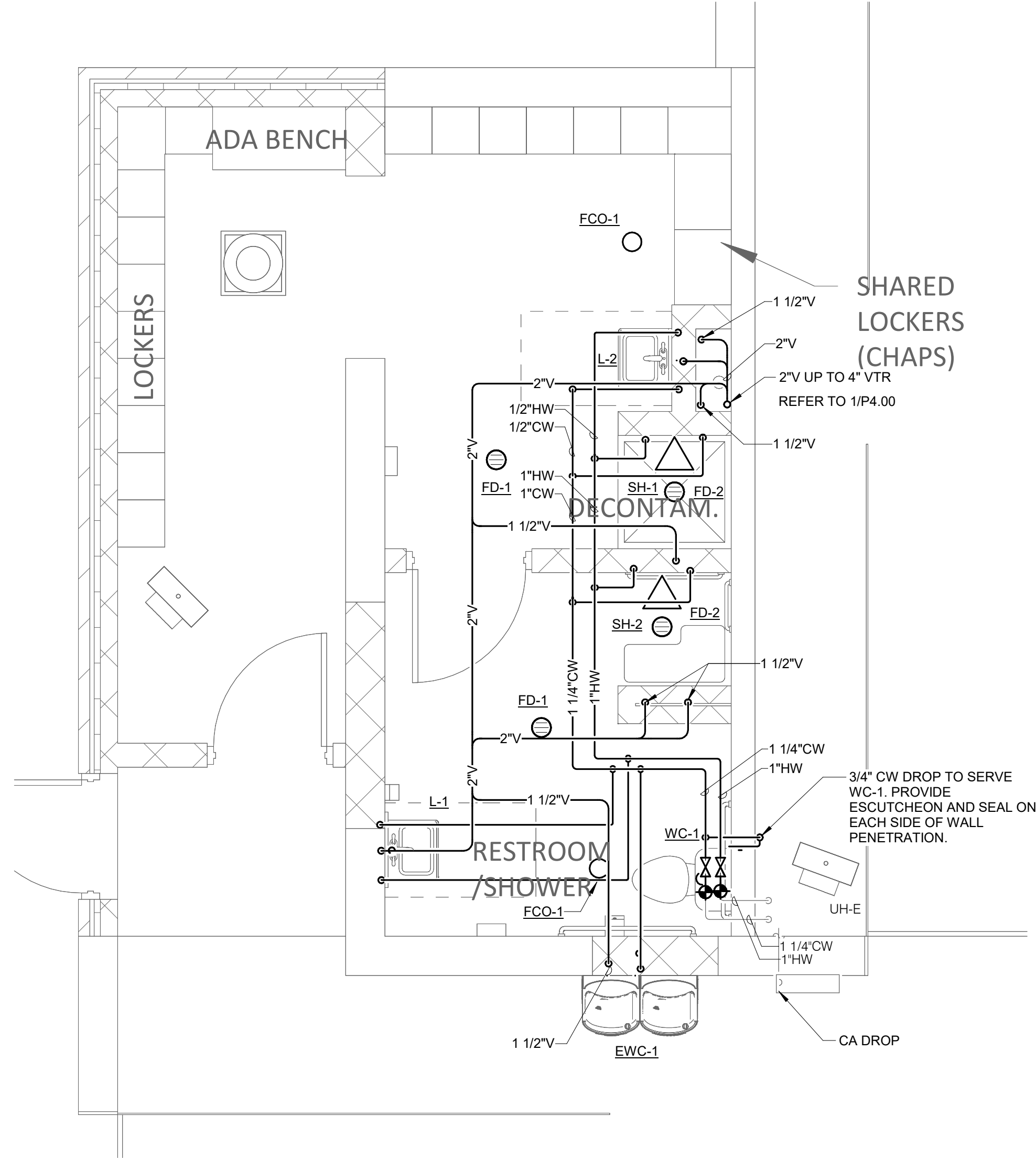
3/8" = 1'-0"



2

LEVEL 1 PLAN - PLUMBING - RESTROOM / LOCKER ROOM

3/8" = 1'-0"



SHEET NOTES

1. RUN ALL EXPOSED PIPING AS TIGHT TO CEILING AS POSSIBLE. ALL INSULATED PIPING EXPOSED IN LOCKER ROOM OR RESTROOM SHALL BE JACKETED. REFER TO SPECIFICATIONS.
2. REFER TO DETAIL 2/P4.00 FOR CLEANOUT DETAIL.



623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com
IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

0 1 2 3
REF. SCALE IN INCHES PROJECT #24001440.00

PHASE

- ☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

DATE
10/21/24

SHEET
No.
P3.00

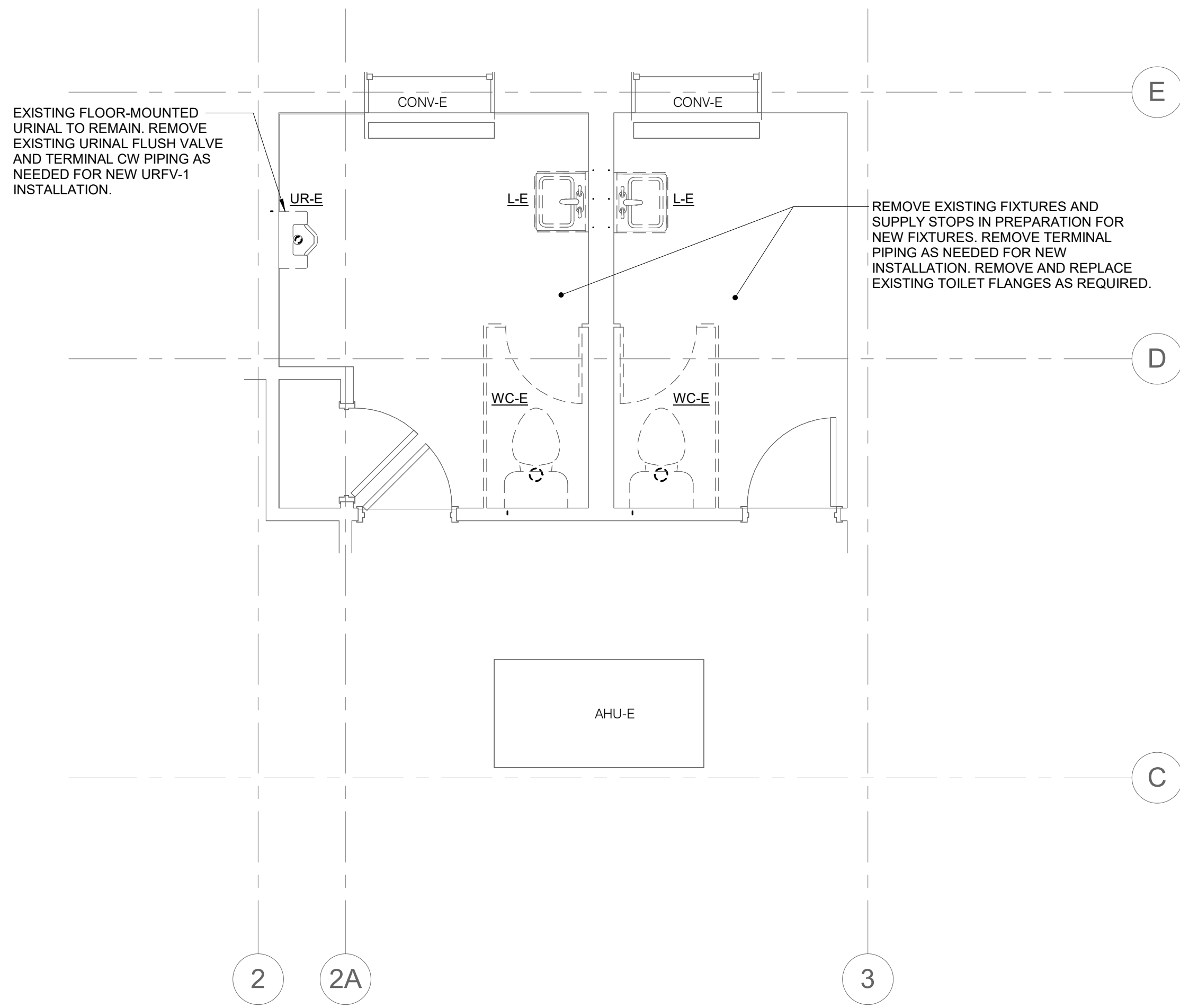
ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264
PLUMBING ENLARGED PLANS

WILLETT HOFMANN
& ASSOCIATES
ENGINEERING ARCHITECTURE LAND SERVING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.376.1401

DESIGNED
ZACMAN
CHECKER
PETCOU

REMARKS

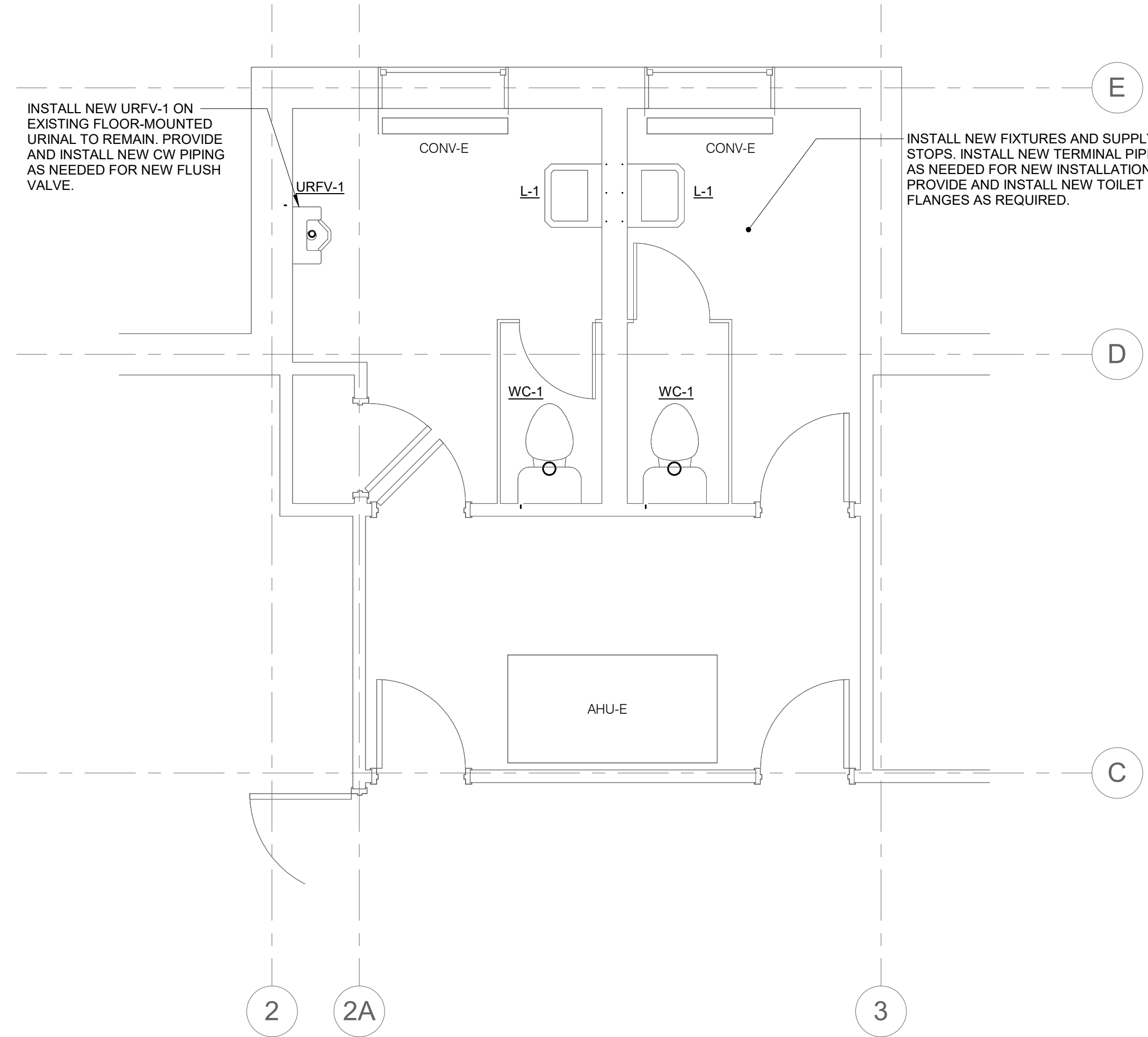
This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hofmann & Associates, Inc.



1

LEVEL 1 DEMOLITION PLAN - PLUMBING - ADMIN - RESTROOMS

3/8" = 1'-0"



2

LEVEL 1 PLAN - PLUMBING - ADMIN - RESTROOMS

3/8" = 1'-0"

IMEG
623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com
IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014
REF. SCALE IN INCHES PROJECT #24001440.00

- PHASE**
- ☐ PRELIM
 - ☐ PERMIT
 - ☐ FINAL
 - ☒ BID
 - ☐ CONST

WHA No.
1854D23

DATE
10/21/24

SHEET No.
P3.01

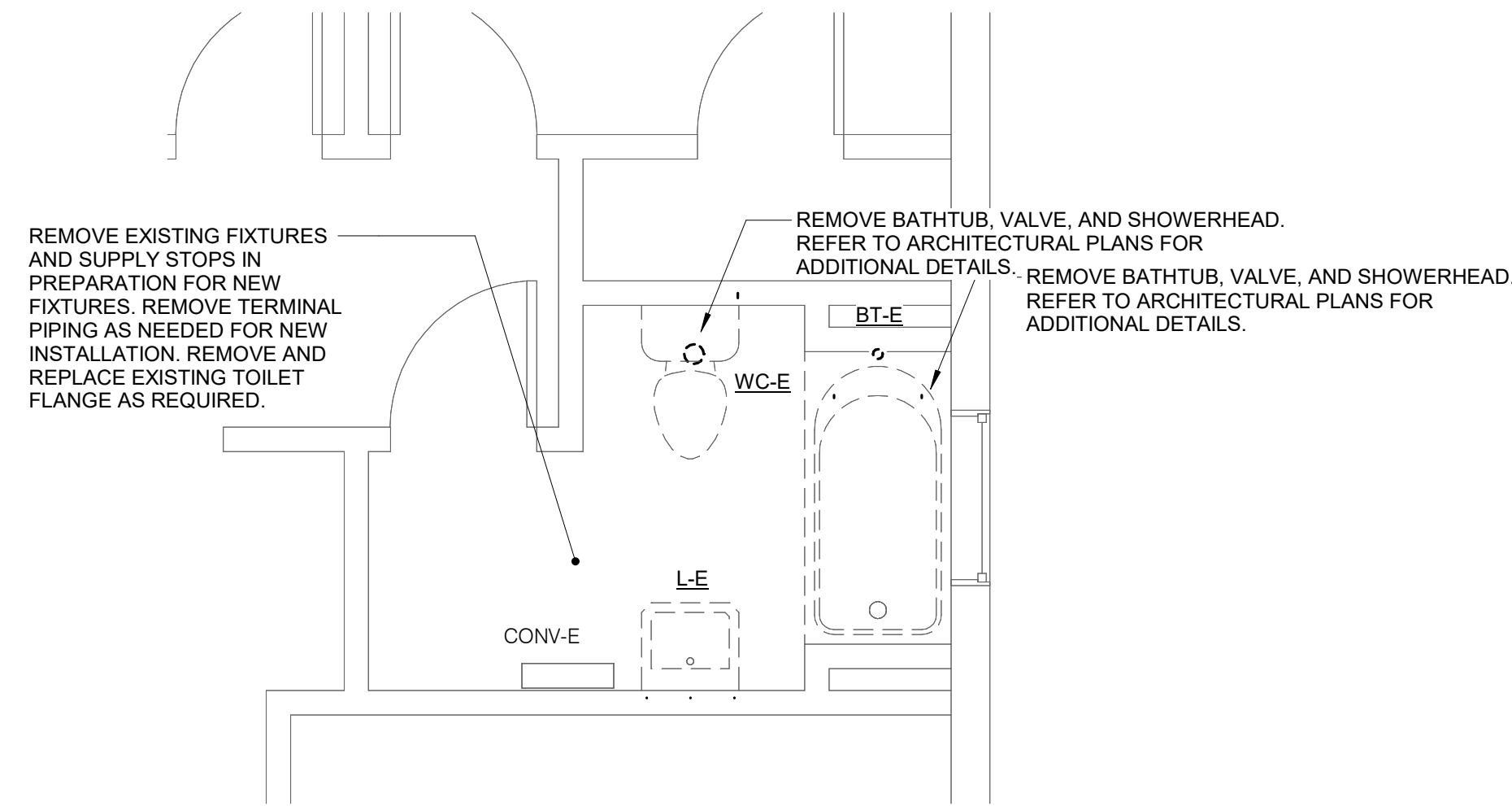
ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264
PLUMBING ENLARGED PLANS



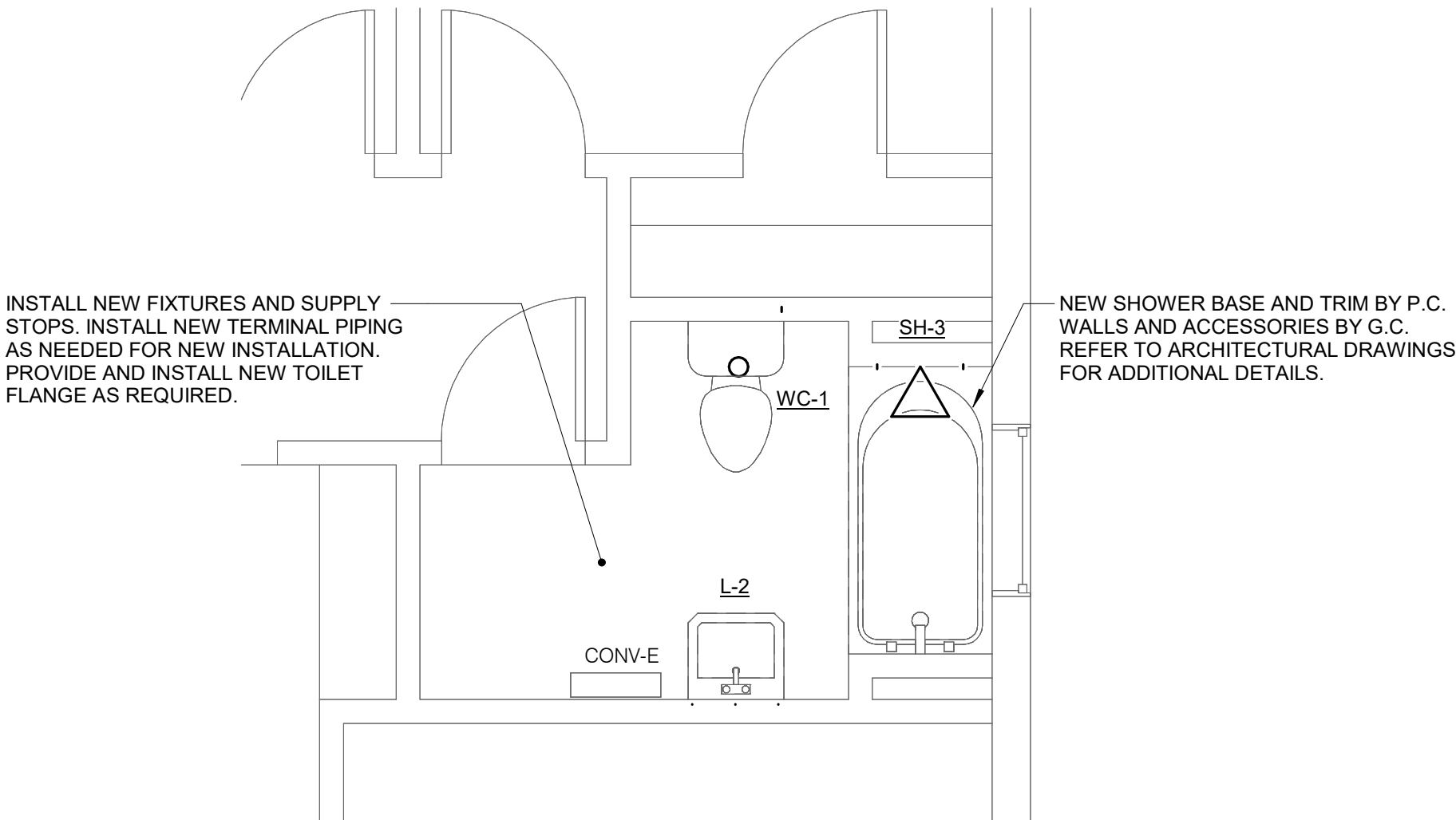
WILLET HOFFMANN & ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SURVEYING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.726.1401

DESIGNED	BY	DATE	REV.	REMARKS
ZACMAN				
CHECKER				
PETCOU				

This document is the copyrighted property of Willett, Hoffmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hoffmann & Associates, Inc.



1 LEVEL 2 DEMOLITION PLAN - PLUMBING - RESTROOM
3/8" = 1'-0"



2 LEVEL 2 PLAN - PLUMBING - RESTROOM
3/8" = 1'-0"



623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

0123

REF. SCALE IN INCHES

PROJECT #24001440.00

- PHASE
- ☐ PRELIM
 - ☐ PERMIT
 - ☐ FINAL
 - ☒ BID
 - ☐ CONST

WHA No.
1854D23

DATE
10/21/24

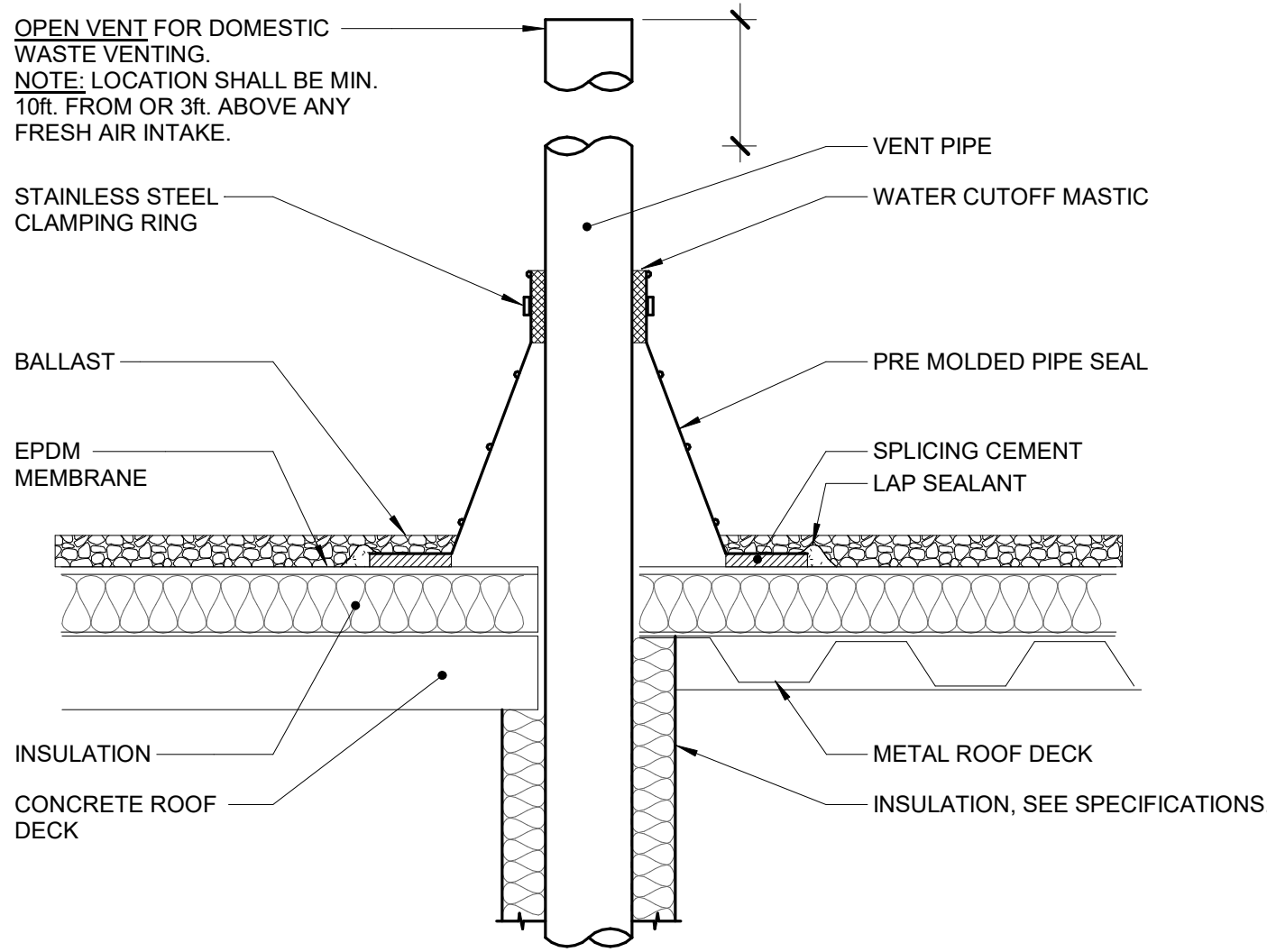
SHEET
No.
P3.02

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264
PLUMBING ENLARGED PLANS

WILLETT HOFMANN
& ASSOCIATES
ENGINEERING ARCHITECTURE LAND SERVING
622 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.276.1401



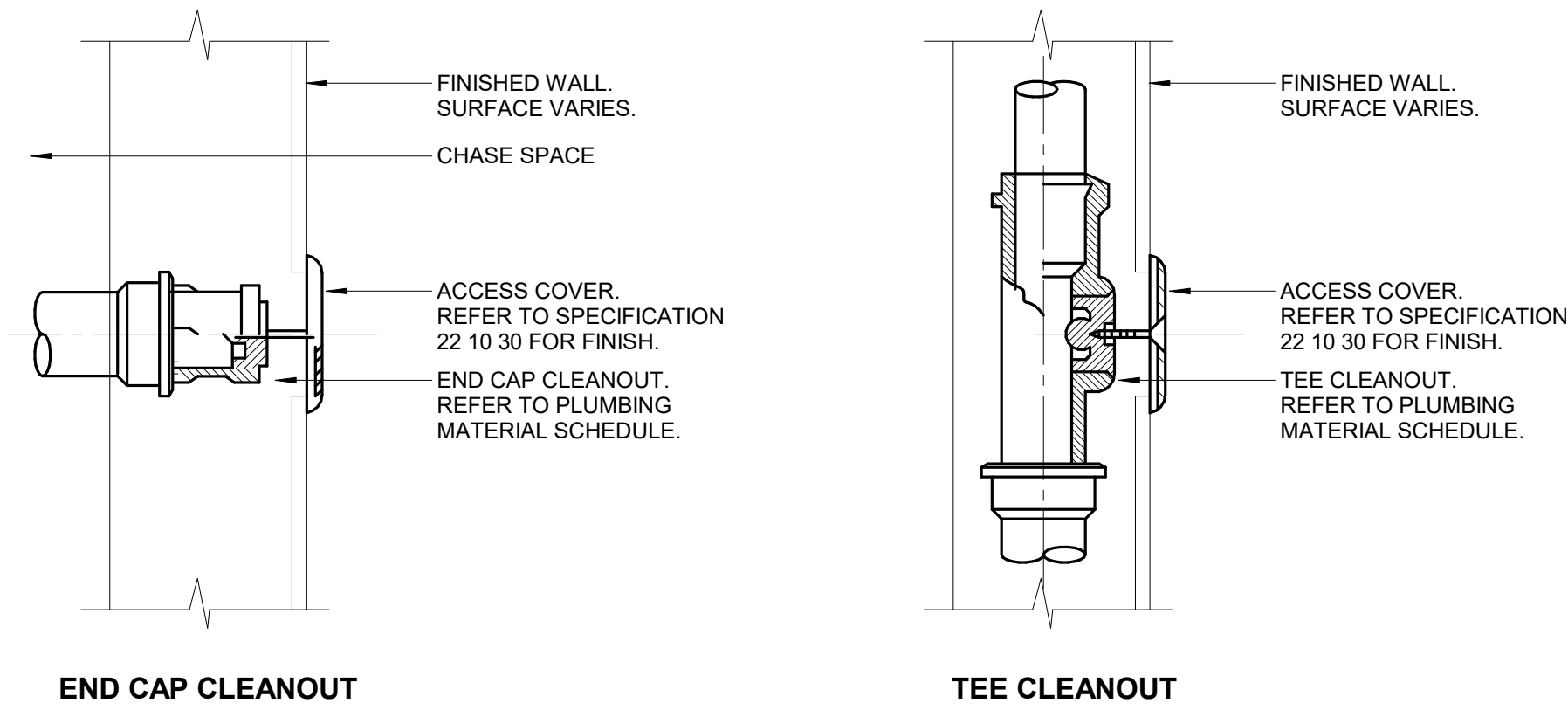
This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hofmann & Associates, Inc. WYCAN



NOTES:

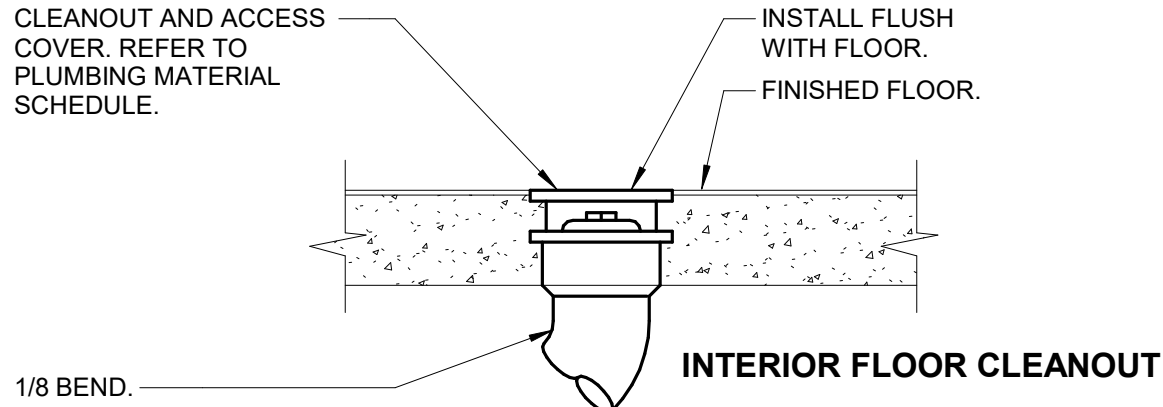
1. VENT PIPE SHALL BE A MINIMUM OF 4" DIAMETER UNLESS NOTED LARGER ON FLOOR PLANS. INCREASES, IF REQUIRED TO TRANSITION TO THE LARGER VTR SIZE, MUST BE INSTALLED AT LEAST 12 INCHES BELOW THE THERMAL ENVELOPE OF THE BUILDING.
2. EXTEND VENT PIPE AT LEAST 7 FEET ABOVE ROOF LEVEL WHEN ROOF AREA IS INTENDED TO BE USED BY THE GENERAL PUBLIC. THIS INCLUDES PROMENADES, OBSERVATION DECKS, ETC. THIS IS NOT REQUIRED FOR ROOFS THAT ARE ACCESSIBLE BY MAINTENANCE PERSONNEL ONLY.

1 VENT PIPE FLASHING
NO SCALE



NOTE:

1. CLEANOUTS SHALL BE PROVIDE PER SPECIFICATION SECTION 22 10 30 AND THE APPLICABLE CODE.
2. SPECIFICATION 22 10 30 SHALL BE FOLLOWED WHEN IT EXCEEDS THE CODE MINIMUM REQUIREMENTS.
3. HUB AND SPIGOT PIPE JOINT SYSTEM IS SHOWN AS AN EXAMPLE. REFER TO SECTION 22 10 00 FOR PIPE JOINING METHOD SPECIFIC TO PROJECT AND SYSTEM.



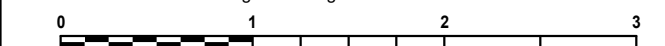
2 WALL CLEAN OUT DETAIL
NO SCALE

WCO LOCATION SCHEDULE (UNLESS SHOWN OTHERWISE ON FLOOR PLAN)	
WATER CLOSET	ON VENT ABOVE WC
URINAL	ON VENT ABOVE UR
LAV. WALL	ON WASTE BELOW LAV
LAV. COUNTER	ON WASTE BELOW LAV THRU BACK OF CABINET
SINK	ON WASTE BELOW SK THRU BACK OF CABINET
FLOOR MOUNTED FIXTURES WITH HORIZONTAL UNDERFLOOR VENT	ON VENT 18" ABOVE PENETRATION THROUGH FLOOR
GENERAL: A. ON VENT FROM ISLAND FIXTURES. B. END OF HORIZONTAL CHASE WASTE LINE. C. AT THE BASE OF STORM AND SANITARY WASTE RISERS. D. AS REQUIRED BY PLUMBING CODE.	



623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014



0 1 2 3
REF. SCALE IN INCHES PROJECT #24001440.00

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

PLUMBING DETAILS

PHASE
☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

DATE
10/21/24

SHEET
No.
P4.00

WILLETT HOFMANN
& ASSOCIATES
ENGINEERING ARCHITECTURE LAND SERVING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.376.1401



PLUMBING MATERIAL LIST		
TAG NAME	DESCRIPTION	MANUFACTURER AND MODEL
FCO-1	FLOOR CLEANOUT - ADJUSTABLE, CAST IRON HOUSING, ANCHOR FLANGE, TAPERED THREAD PLUG, SECURED NICKEL BRONZE TOP. TOP STYLE SHALL MATCH FLOOR FINISH AS FOLLOWS: UNFINISHED FLOOR - ROUND SOLID SCORIATED TOP TILE OR TERRAZZO - ROUND RECESSED TOP	ZURN (Z1400), JOSAM (55000), MIFAB (C1100), SMITH (4000), WADE (6000), WATTS (CO-200)
FD-1	FLOOR DRAIN - CAST IRON BODY, NICKEL BRONZE ADJUSTABLE TOP, 6" ROUND, 2" BOTTOM OUTLET, FLASHING COLLAR. TRAP SEAL - 2" PLASTIC HOUSING WITH FLEXIBLE DIAPHRAGM, SEALING GASKETS, RECLOSES AND SEALS WHEN DISCHARGE IS COMPLETED, ASSE 1072.	FLOOR DRAIN - ZURN (Z-415), SMITH (2005), WADE (1100), JOSAM (30000), WATTS (FD-100), MIFAB (F1100), SUN (FD1000) TRAP SEAL - SURE SEAL (SS), PROVENT (TRAP GUARD), SMITH (QUAD CLOSE), GREEN DRAIN, MIFAB (MI-GARD), ZURN (Z1072)
FD-2	FLOOR DRAIN - CAST IRON BODY, NICKEL BRONZE ADJUSTABLE TOP, 6" ROUND, 2" BOTTOM OUTLET, FLASHING COLLAR.	FLOOR DRAIN - ZURN (Z-415), SMITH (2005), WADE (1100), JOSAM (30000), WATTS (FD-100), MIFAB (F1100), SUN (FD1000)
L-1	LAVATORY - ACCESSIBLE, WALL MOUNTED, WHITE VITREOUS CHINA, 20"x18", 4" HIGH CONTOURED BACKSPASH, FAUCET HOLES ON 4" CENTERS, DRILLED FOR CONCEALED ARM CARRIER. LAVATORY TRIM - LAVATORY TRIM - SENSOR ACTIVATED NON-MIXING FAUCET, BATTERY POWERED, BRASS CONSTRUCTION, CHROME-PLATED FINISH, SPOUT WITH AERATOR, 4" CENTERSET INSTALLATION, PERFORATED GRID STRAINER WITH 1-1/4" 17 GAUGE TAILPIECE, SOLID BRASS SOLENOID WITH BUILT-IN FILTER, WATERPROOF CONNECTORS AND CABLE. MOUNT CONTROLS AND BATTERIES IN WATERPROOF VANDAL-RESISTANT ENCLOSURE BELOW LAVATORY. MAXIMUM FLOW TO BE 0.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AND ESCUTCHEON PLATE AS REQUIRED. MIXING VALVE - POINT-OF-USE ANTI-SCALD THERMOSTATIC MIXING VALVE FOR TEMPERED WATER CONTROL, ALL BRONZE/BRASS CONSTRUCTION, ROUGH FINISH, THREADED INLETS, TAMPER RESISTANT SETPOINT, 3/8" COMPRESSION INLETS AND OUTLETS, COLD WATER BYPASS IF USED WITH MIXING FAUCET. 0.5 GPM OUTPUT. UNIT TO MIX 140 DEGREE F HOT WATER SUPPLY AND 40 DEGREE F COLD WATER SUPPLY FOR 110 DEGREE F OUTLET. UNIT SHALL BE ASSE 1070 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874. INSULATION KIT - PRE-MANUFACTURED FOR P-TRAP, STOP VALVES AND SUPPLY LINES. ACCESSORIES - QUARTER-TURN 3/8" CHROME PLATED HEAVY BRASS ANGLE SUPPLY STOPS, CHROME PLATED SOFT COPPER OR FLEXIBLE STAINLESS STEEL SUPPLY LINES, DRAIN AND OFFSET TAILPIECE, 1-1/4" 17 GAUGE CAST BRASS P-TRAP, SUPPORT CARRIER. MOUNT LAVATORY WITH SUPPORT CARRIER BOLTED SECURELY TO FLOOR. TOP OF RIM SHALL BE AT 34" ABOVE FLOOR IN COMPLIANCE WITH LATEST ADA STANDARD. [PROVIDE 29" MINIMUM CLEARANCE FROM FLOOR TO BOTTOM OF APRON IN COMPLIANCE WITH LATEST ANSI A117.1 AND ADA STANDARDS. ARMAFLEX WITH TAPE IS NOT ACCEPTABLE IN LIEU OF INSULATION KIT.	LAVATORY - AMERICAN STANDARD (0355.012), KOHLER (K-2005), SLOAN (SS-3003), TOTO (LT307), ZURN (Z5364) LAVATORY TRIM - SLOAN (SF-2350 [SF-2300]), ZURN (Z6915-XL), CHICAGO FAUCETS (EVR SERIES), HYDROTEK (HB-1000C-LR [H-1000C-LR]), MOEN (M-POWER C48301) MIXING VALVE - LEONARD (170-LF), ACORN CONTROLS (ST7069), APOLLO (34BLF), BRADLEY (S59 SERIES), LAWLER (310/570), POWERS (SERIES LFLM495), SYMMONS (8210CK MAXLINE SERIES), WATTS (LFMMV), WILKINS (ZW1070XL) INSULATION KIT - TRUEBRO (LAV-GUARD), BROCAR PRODUCTS (TRAP WRAP), MCGUIRE (PROWRAP), PLUMBEREX (PRO-EXTREME) MOUNT LAVATORY WITH SUPPORT CARRIER BOLTED SECURELY TO FLOOR. TOP OF RIM SHALL BE AT 34" ABOVE FLOOR IN COMPLIANCE WITH LATEST ADA STANDARD, DRILLED FOR CONCEALED ARM CARRIER. LAVATORY TRIM - LAVATORY TRIM - SINGLE HANDLE MIXING FAUCET, BRASS CONSTRUCTION, CHROME-PLATED FINISH, CONVENTIONAL SPOUT WITH LAMINAR FLOW OUTLET, WASHERLESS PUSH-PULL LEVER HANDLE WITH SUPPLIES AT 4" CENTERS, CERAMIC DISC CARTRIDGE, PERFORATED GRID STRAINER WITH 1-1/4" 17 GAUGE TAILPIECE. MAXIMUM FLOW TO BE 0.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AS REQUIRED. MIXING VALVE - POINT-OF-USE ANTI-SCALD THERMOSTATIC MIXING VALVE FOR TEMPERED WATER CONTROL, ALL BRONZE/BRASS CONSTRUCTION, ROUGH FINISH, THREADED INLETS, TAMPER RESISTANT SETPOINT, 3/8" COMPRESSION INLETS AND OUTLETS, COLD WATER BYPASS IF USED WITH MIXING FAUCET. 0.5 GPM OUTPUT. UNIT TO MIX 140 DEGREE F HOT WATER SUPPLY AND 40 DEGREE F COLD WATER SUPPLY FOR 110 DEGREE F OUTLET. UNIT SHALL BE ASSE 1070 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874. INSULATION KIT - PRE-MANUFACTURED FOR P-TRAP, STOP VALVES AND SUPPLY LINES. ACCESSORIES - QUARTER-TURN 3/8" CHROME PLATED HEAVY BRASS ANGLE SUPPLY STOPS, CHROME PLATED SOFT COPPER OR FLEXIBLE STAINLESS STEEL SUPPLY LINES, DRAIN AND OFFSET TAILPIECE, 1-1/4" 17 GAUGE CAST BRASS P-TRAP, SUPPORT CARRIER. MOUNT LAVATORY WITH SUPPORT CARRIER BOLTED SECURELY TO FLOOR. TOP OF RIM SHALL BE AT 34" ABOVE FLOOR IN COMPLIANCE WITH LATEST ADA STANDARD. PROVIDE 29" MINIMUM CLEARANCE FROM FLOOR TO BOTTOM OF APRON IN COMPLIANCE WITH LATEST ANSI A117.1 AND ADA STANDARDS. ARMAFLEX WITH TAPE IS NOT ACCEPTABLE IN LIEU OF INSULATION KIT.
L-2	LAVATORY - ACCESSIBLE, WALL MOUNTED, WHITE VITREOUS CHINA, 20"x18", 4" HIGH CONTOURED BACKSPASH, FAUCET HOLES ON 4" CENTERS, DRILLED FOR CONCEALED ARM CARRIER. LAVATORY TRIM - LAVATORY TRIM - SINGLE HANDLE MIXING FAUCET, BRASS CONSTRUCTION, CHROME-PLATED FINISH, CONVENTIONAL SPOUT WITH LAMINAR FLOW OUTLET, WASHERLESS PUSH-PULL LEVER HANDLE WITH SUPPLIES AT 4" CENTERS, CERAMIC DISC CARTRIDGE, PERFORATED GRID STRAINER WITH 1-1/4" 17 GAUGE TAILPIECE. MAXIMUM FLOW TO BE 0.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AS REQUIRED. MIXING VALVE - POINT-OF-USE ANTI-SCALD THERMOSTATIC MIXING VALVE FOR TEMPERED WATER CONTROL, ALL BRONZE/BRASS CONSTRUCTION, ROUGH FINISH, THREADED INLETS, TAMPER RESISTANT SETPOINT, 3/8" COMPRESSION INLETS AND OUTLETS, COLD WATER BYPASS IF USED WITH MIXING FAUCET. 0.5 GPM OUTPUT. UNIT TO MIX 140 DEGREE F HOT WATER SUPPLY AND 40 DEGREE F COLD WATER SUPPLY FOR 110 DEGREE F OUTLET. UNIT SHALL BE ASSE 1070 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874. INSULATION KIT - PRE-MANUFACTURED FOR P-TRAP, STOP VALVES AND SUPPLY LINES. ACCESSORIES - QUARTER-TURN 3/8" CHROME PLATED HEAVY BRASS ANGLE SUPPLY STOPS, CHROME PLATED SOFT COPPER OR FLEXIBLE STAINLESS STEEL SUPPLY LINES, DRAIN AND OFFSET TAILPIECE, 1-1/4" 17 GAUGE CAST BRASS P-TRAP, SUPPORT CARRIER. MOUNT LAVATORY WITH SUPPORT CARRIER BOLTED SECURELY TO FLOOR. TOP OF RIM SHALL BE AT 34" ABOVE FLOOR IN COMPLIANCE WITH LATEST ADA STANDARD. PROVIDE 29" MINIMUM CLEARANCE FROM FLOOR TO BOTTOM OF APRON IN COMPLIANCE WITH LATEST ANSI A117.1 AND ADA STANDARDS. ARMAFLEX WITH TAPE IS NOT ACCEPTABLE IN LIEU OF INSULATION KIT.	LAVATORY - AMERICAN STANDARD (0355.012), KOHLER (K-2005), SLOAN (SS-3003), TOTO (LT307), ZURN (Z5364) LAVATORY TRIM - DELTA (22C131), AMERICAN STANDARD (7385), CHICAGO FAUCET (420), KOHLER (K-15597), MOEN (8413), SPEAKMAN (S-3561), SYMMONS (S-20), T&S BRASS (B-2711-VF05), ZURN (Z7440-XL) MIXING VALVE - WATTS (LFUSG-B), LEONARD (170D-LF), LAWLER (TMM-1070T), ACORN CONTROLS (ST70), APOLLO (34DLF), POWERS (LFE480), SLOAN (MIX-135-A), SYMMONS (8210CK), WILKINS (ZW3870XL-T) INSULATION KIT - TRUEBRO (LAV-GUARD), BROCAR PRODUCTS (TRAP WRAP), MCGUIRE (PROWRAP), PLUMBEREX (PRO-EXTREME)
SH-1	SHOWER STALL INSTALLED BY G.C. SHOWER VALVE - SINGLE HANDLE PRESSURE BALANCED MIXING FAUCET, BRASS OR BRONZE CONSTRUCTION, POLISHED CHROME, CAST METAL LEVER HANDLE, WASHERLESS DESIGN, OFF-COLD-HOT TEMPERATURE RANGE INDICATOR DIAL, INTEGRAL CHECK STOPS, ADJUSTABLE TEMPERATURE LIMIT STOP, ASSE 1016 LISTED. ACCESSORIES - CHROME-PLATED BRASS SHOWERHEAD WITH SWIVEL BALL JOINT, ADJUSTABLE SPRAY, CHROME-PLATED BRASS ARM AND FLANGE. INSTALL BOTTOM OF SHOWERHEAD AT 78" ABOVE FINISHED FLOOR. MAXIMUM FLOW TO BE 2.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. SET SAFETY LIMIT STOP TO 110 DEGREE F DISCHARGE.	MOEN COMMERCIAL (8375), SYMMONS (1-100), AMERICAN STANDARD (T675.501), DELTA (R10000-UNWS/T13H22), LEONARD (PAM-II), POWERS (PB413-K1)

PLUMBING MATERIAL LIST		
TAG NAME	DESCRIPTION	MANUFACTURER AND MODEL
SH-2	ACCESSIBLE SHOWER STALL INSTALLED BY G.C. SHOWER VALVE - ACCESSIBLE, SINGLE HANDLE PRESSURE BALANCED MIXING FAUCET, BRASS OR BRONZE CONSTRUCTION, WASHERLESS DESIGN, OFF-COLD-HOT TEMPERATURE RANGE INDICATOR DIAL, POLISHED CHROME CAST METAL LEVER HANDLE, INTEGRAL CHECK STOPS, ADJUSTABLE TEMPERATURE LIMIT STOP. ASSE 1016 LISTED. ACCESSORIES - CHROME-PLATED BRASS SHOWERHEAD WITH SWIVEL BALL JOINT, CHROME-PLATED BRASS ARM AND FLANGE, HAND HELD SHOWER WITH ON/OFF CONTROL AND NON-POSITIVE SHUT OFF, 69" CHROME-PLATED METAL HOSE AND QUICK DISCONNECT, CHROME-PLATED BRASS SWIVEL CONNECTOR, 30" CHROME-PLATED MOUNTING RAIL, CHROME-PLATED BRASS SUPPLY ELBOW FLANGE, CHROME-PLATED IN-LINE VACUUM BREAKER WITH CHROME-PLATED PIPING AND FLANGES, CHROME-PLATED BRASS 2 FUNCTION TRANSFER VALVE. INSTALL ALL CONTROLS BETWEEN 38" AND 48" ABOVE FINISHED FLOOR IN COMPLIANCE WITH LATEST ADA STANDARDS. INSTALL BOTTOM OF SHOWERHEAD AT 78" ABOVE FINISHED FLOOR. MAXIMUM FLOW TO BE 2.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. SET SAFETY LIMIT STOP TO 110 DEGREE F DISCHARGE.	MOEN COMMERCIAL (8342/52236GBM25), SYMMONS (9605-PLR), AMERICAN STANDARD (TU662.223), DELTA (R10700-UNWS/T13H323-20), LEONARD (PAM-II-ST-F/51-3D/62003), POWERS (PB417M202BV)
SH-3	SHOWER BASE - ONE PIECE, FIBERGLASS CONSTRUCTION, WHITE GELCOATED FINISH, 36"x60" (NOMINAL), 2" DRAIN, STAINLESS STEEL REMOVABLE STRAINER. SHOWER WALLS - TILE BY OTHERS. ACCESSORIES - ROD AND CURTAIN BY OTHERS. SHOWER VALVE - ACCESSIBLE, SINGLE HANDLE PRESSURE BALANCED MIXING FAUCET, BRASS OR BRONZE CONSTRUCTION, WASHERLESS DESIGN, OFF-COLD-HOT TEMPERATURE RANGE INDICATOR DIAL, POLISHED CHROME CAST METAL LEVER HANDLE, INTEGRAL CHECK STOPS, ADJUSTABLE TEMPERATURE LIMIT STOP. ASSE 1016 LISTED. ACCESSORIES - CHROME-PLATED BRASS SHOWERHEAD WITH SWIVEL BALL JOINT, CHROME-PLATED BRASS ARM AND FLANGE, HAND HELD SHOWER WITH ON/OFF CONTROL AND NON-POSITIVE SHUT OFF, 69" CHROME-PLATED METAL HOSE AND QUICK DISCONNECT, CHROME-PLATED BRASS SWIVEL CONNECTOR, 30" CHROME-PLATED MOUNTING RAIL, CHROME-PLATED BRASS SUPPLY ELBOW FLANGE, CHROME-PLATED IN-LINE VACUUM BREAKER WITH CHROME-PLATED PIPING AND FLANGES, CHROME-PLATED BRASS 2 FUNCTION TRANSFER VALVE. INSTALL ALL CONTROLS BETWEEN 38" AND 48" ABOVE FINISHED FLOOR IN COMPLIANCE WITH LATEST ADA STANDARDS. INSTALL BOTTOM OF SHOWERHEAD AT 78" ABOVE FINISHED FLOOR. MAXIMUM FLOW TO BE 2.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. SET SAFETY LIMIT STOP TO 110 DEGREE F DISCHARGE.	SHOWER BASE - OASIS (SB-3636), AQUARIUS (SB-3636), AQUATIC (ICON SB3636), ACORN (CSBS-36-3F), MAAX (Icon 3636), SWAN (R-3636) SHOWER VALVE - MOEN COMMERCIAL (8342/52236GBM25), SYMMONS (9605-PLR), AMERICAN STANDARD (TU662.223), DELTA (R10700-UNWS/T13H323-20), LEONARD (PAM-II-ST-F/51-3D/62003), POWERS (PB417M202BV)
URFV-1	FLUSH VALVE - EXPOSED, SENSOR OPERATION, BATTERY POWERED, 0.5 GALLONS PER FLUSH, 11-1/2" ROUGH-IN, CHROME-PLATED, 3/4" I.P.S. SCREWDRIVER STOP-CHECK VALVE WITH VANDAL RESISTANT CAP, HIGH BACK PRESSURE VACUUM BREAKER, NON-HOLD-OPEN HANDLE, ADJUSTABLE TAILPIECE, SPUD COUPLING AND FLANGE, WALL FLANGE WITH SET SCREW, MANUAL OVER-RIDE, LOW BATTERY INDICATOR LIGHT, RANGE ADJUSTMENT SCREW, CHLORAMINE RESISTANT MATERIALS, 3-YEAR WARRANTY.	ZURN (ZER6003AV), SLOAN (186FSM), AMERICAN STANDARD (6063051.002), HYDROTEK (HB8-B1-05), MOEN (8315), KOHLER (K-10968-SV-CP), TOTO (TEU1LAT2FCP), AMTC (AEF-801-CU-05)
WC-1	WATER CLOSET - ACCESSIBLE, FLOOR MOUNTED, TANK TYPE, WHITE VITREOUS CHINA, CLOSE COUPLED, SIPHON JET, ELONGATED BOWL, BOLT CAPS, 12" ROUGH-IN, FLOAT VALVE WITH VACUUM BREAKER, CHROME-PLATED TRIP LEVER, 1.6 GALLONS PER FLUSH (MAXIMUM). SEAT - WHITE, EXTRA HEAVY, OPEN FRONT, INJECTION MOLDED SOLID ANTI-MICROBIAL PLASTIC, SELF-SUSTAINING HINGE, STAINLESS STEEL OR PLATED STEEL POSTS AND NUTS. ACCESSORIES - QUARTER-TURN 3/8" CHROME-PLATED HEAVY BRASS ANGLE SUPPLY WITH STOP, CHROME-PLATED SOFT COPPER SUPPLY LINE. TOP OF SEAT SHALL BE AT 17"-19" ABOVE FINISHED FLOOR. FLUSH HANDLE SHALL BE LOCATED ON THE WIDE SIDE OF THE TOILET STALL AND OPERATE WITH NO GREATER THAN 5 LB FORCE IN COMPLIANCE WITH LATEST ADA STANDARDS. VERIFY EQUIPMENT REQUIREMENTS AND ROUGH-IN LOCATIONS.	WATER CLOSET - ZURN (Z5555-K), CRANE (3814), KOHLER (K-3979), ELIJER (091-2175), GERBER (21-718), TOTO (CS7744SL), NIAGARA PRO (C11.300.01 or C11.301.01) SEAT - BEMIS (3155SSCT), CHURCH (3155C), BENEKE (533PC), OLSONITE (95), SAME AS WATER CLOSET MANUFACTURER

PLUMBING (WITH POWER) MATERIAL LIST									
TAG NAME	DESCRIPTION	ELECTRICAL					MANUFACTURER AND MODEL		
		HP (NOTE E)	VOLTAGE	PHASES	BY (NOTE A)	DISCONNECT TYPE (NOTE B)			
EW-C-1	ELECTRIC WATER COOLER - WALL HUNG, BI-LEVEL UNITS, ADA COMPLIANT WITH MATCHING STAINLESS STEEL APRON INSTALLED UNDER UPPER UNIT 18 GAUGE STAINLESS STEEL CABINETS AND NON-SPLASH BASINS WITH STAINLESS STEEL FINISH, STREAM PROJECTORS WITH PROTECTIVE HOODS, PUSH BAR OR LEVER OPERATING CONTROLS ON FRONT AND BOTH SIDES, BUILT-IN FLOW REGULATOR, PLASTIC P-TRAP ASSEMBLY, ADJUSTABLE THERMOSTAT, MOUNTING ACCESSORIES, TANK DRAIN AND ANGLE STOPS, HERMETIC COMPRESSOR TO OPERATE ON HFC-134a REFRIGERANT, COMPLIANT TO LATEST ANSI A117.1 AND ADA STANDARDS. UNIT SHALL COMPLY WITH FEDERAL ACT S.3874. BOTTLE FILLING STATION - UNIT MOUNTED, STAINLESS STEEL CONSTRUCTION AND FINISH, INTEGRAL DRAIN, SENSOR OPERATED WITH AUTOMATIC SHUTOFF, REPLACEABLE LEAD-CHLORINE-TASTE-ODOR WATER FILTER, BOTTLE COUNTER, FILTER REPLACEMENT INDICATOR. UNIT SHALL PROVIDE 8.0 GPH OF WATER FROM 80°F TO 50°F AT 90°F AMBIENT. WATER SYSTEM SHALL BE OF LEAD FREE CONSTRUCTION. TANK SHALL BE TESTED TO 125 PSIG. ORIFICE SHALL BE AT 36" (MAXIMUM) ABOVE FINISHED FLOOR ON LOWER UNIT AND 40" ABOVE FINISHED FLOOR ON UPPER UNIT. BOTTOM OF APRON SHALL BE 27" ABOVE FLOOR ON LOWER UNIT IN COMPLIANCE WITH LATEST ADA STANDARDS. ELECTRICAL REQUIREMENTS - CORD AND PLUG, PLAIN RECEPTACLE MOUNTED WITHIN EWC LOWER ENCLOSURE, GFCI BREAKER.	0.25	120	1	EC	PLUG	ELECTRIC WATER COOLER-ELKAY (LZST), OASIS (PG8EBFSL), MURDOCK (A172408F-UG-BF12)		

PIPE INSULATION SCHEDULE (PLUMBING)									
GENERAL NOTES: 1. REFER TO THE SPECIFICATIONS FOR TYPE DESCRIPTIONS AND JACKETING REQUIREMENTS. VALUES LISTED BELOW ARE BASED ON ASHRAE / IECC REQUIREMENTS. 2. TYPE A INSULATION IS NOT ALLOWED IN NON-AIR CONDITIONED SPACES, SUCH AS MECHANICAL ROOMS, EXTERIOR, ATTICS, ETC. 3. TYPE B INSULATION GREATER THAN 1" THICK SHALL BE INSTALLED USING MULTIPLE LAYERS OF 3/4" OR 1" WITH STAGGERED SEAMS. 4. PROVIDE RIGID INSERT AT HANGERS, EITHER PRE-MANUFACTURED COUPLINGS (REFER TO PIPE HANGER AND SUPPORTS SPECIFICATIONS) OR TYPE C OR E INSULATION. SEE SPEC. FOR MORE DETAILS. 5. DIRECT BUIRED PIPING SHALL ONLY USE TYPE C OR TYPE E. REDUCTION IN THICKNESS FOR DIRECT BURED PIPING IS ALLOWED PER ASHRAE / IECC AS APPLICABLE.									
PIPE SYSTEM	INSULATION TYPE	INSULATION THICKNESS PER NOMINAL PIPE OR TUBE SIZE					NOTES		
		< 1"	1" TO < 1.5"	1.5" TO < 4"	4" TO < 8"	≥ 8"			
22 PLUMBING - WASTE									
D - DRAIN - PLUMBING	B (Elasto), E (Polyiso)	0.5"	0.5"	1"	1"	1"	APPLY INSULATION ONLY TO LOW TEMP DRAINS (55 DEG AND LOWER IE: COOLING COIL CONDENSATE, ICE MACHINE DRAINS, ETC.)		
V - VENT	B (Elasto), E (Polyiso)	0.5"	0.5"	1"	1"	1"	APPLY INSULATION ONLY WITHIN 10' OF EXTERIOR PENETRATION		
22 PLUMBING - WATER									
OW - COLD WATER - POTABLE	B (Elasto), E (Polyiso)	0.5"	0.5"	1"	1"	1"			
HW - HOT WATER - POTABLE	B (Elasto), E (Polyiso)	1"	1"	1"	1"	1"			
HWC - HOT WATER CIRCULATING - POTABLE	B (Elasto), E (Polyiso)	1"	1"	1"	1"	1"			
TW - TEMPERED WATER - POTABLE	B (Elasto), E (Polyiso)	1"	1"	1"	1"	1"			



623 28TH AVENUE
ROCK ISLAND, IL 61201
P. 309.786.0673 F. 309.786.5967

www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

01234

REF. SCALE IN INCHES

PROJECT #24001440.00

REMARKS

DESIGNED
ZACMAN

CHECKED
PETCOU

BY

DATE

REV.

WILLETT HOFMANN
& ASSOCIATES
ENGINEERING ARCHITECTURE LAND SERVING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.376.1401

WILETT, Hofmann & Associates, Inc. © Copyright

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

PLUMBING SCHEDULES

PHASE

☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854023

DATE
10/21/24

SHEET
No.
P6.00

This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission.



**Rock
Island
County**

ADDENDUM #1

TO: All Plan Holders of Record
FROM: Matthew M. Miller, County Engineer
DATE: November 6, 2024
RE: Section 23-00399-00-MG (Milan Maint. Garage – Locker Room Addition)

Please be advised of the attached changes regarding the above mentioned plans and proposal:

Should you have any questions regarding these changes please do not hesitate to contact this office. Thank you.

**OFFICE OF THE
COUNTY ENGINEER**

Rock Island County, Illinois

851 W 10th Avenue, P.O. Box 797, Milan, IL 61264

Phone: (309) 787-4668 * Fax: (309) 787-4680



Contains 30%
recycled post-consumer fiber

DOCUMENT 00901
ADDENDUM NO 1

DATE: November 5th, 2024

PROJECT NAME: Locker Room Addition

This addendum forms a part of the bidding and contract documents. This Addendum supersedes and supplements all portions of the original bidding and contract documents dated 10/21/2024, with which it conflicts.

ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE SPACE PROVIDED ON THE BID FORM.
FAILURE TO DO SO MAY SUBJECT THE BIDDER TO DISQUALIFICATION.

DRAWINGS – STRUCTURAL

1. SHEET S1.01 – FOUNDATION PLAN AND DETAILS

- a. 1/S1.01 – New Foundation Plan
 - i. **CHANGE** detail callout tag 3/S1.02 to 2/S1.02 SIM
 - ii. **ADD** section cut reference 5/S1.01
 - iii. **ADD** section cut reference 6/S1.01
- b. 2/S1.01 – New Roof Structure
 - i. **ADD** note that reads “1 ½” 18 GA. METAL DECK”
 - ii. **ADD** note that reads “METAL DECK TO RUN PERPENDICULAR TO STEEL FRAMING MEMBERS”
- c. 3/S1.01 – Lintel Detail
 - i. **CHANGE** bond beam size to 6”
 - ii. **CHANGE** steel angle dimensions to 5”x3”x1/2”
- d. 4/S1.01 – Frost Stoop Section
 - i. **CHANGE** #4 bar spacing to 12” O.C.
 - ii. **ADD** rebar with note that reads “#5 BAR AT 24” O.C. IN CMU WALL”
 - iii. **ADD** 3’-0” and 1’-0” dimensions with 1:1 slope
 - iv. **CHANGE** rigid insulation thickness to 3”
 - v. **ADD** note that reads “ALT. HORIZ. LEG EVERY OTHER BAR”
- e. 5/S1.01 – Foundation Section
 - i. **ADD** architecture wall elements with rebar and note that reads “#5 BAR AT 25” O.C. IN CMU WALL”
 - ii. **CHANGE** #4 bar spacing to 12” O.C.
 - iii. **CHANGE** #4 bar spacing to 12” O.C. HORIZ. REINFORCEMENT
 - iv. **CHANGE** rigid insulation thickness to 3”
 - v. **ADD** “VERT. REINFORCEMENT” to “#4 BENT BARS AT 12” O.C.” note
 - vi. **CHANGE** rebar shown in footing and **ADD** “3” CLEAR” note
- f. 6/S1.01 – Footing Detail
 - i. **CHANGE** linework to show existing footing elements
 - ii. **REMOVE** notes corresponding to existing footing elements
- g. 7/S1.01 – TYP Slab Control Joint Detail
 - i. **CHANGE** dowel spacing to 12” MAX
 - ii. **CHANGE** #4 bar spacing to 12” O.C.
 - iii. **CHANGE** dimension to 3” MIN
- h. 8/S1.01 – TYP Slab Control Joint Detail1
 - i. **REMOVE DETAIL**

2. SHEET S1.02 – FOUNDATION DETAILS

- a. 3/S1.02 – Exist to New
 - i. **REMOVE DETAIL**

DRAWINGS – ARCHITECTURAL

1. **SHEET G0.00**
 - a. Code Summary
 - i. **CHANGE** Applicable Codes to 2021 Editions.
2. **SHEET A1.01**
 - i. **REPLACE** sheet with revised dated 11/05/2024.
3. **SHEET A1.03**
 - i. **REPLACE** sheet with revised dated 11/05/2024.
4. **SHEET A1.04**
 - a. Roof Plan 1
 - i. **ADD** detail tag 6/A1.04 at existing parapet tie in.
 - ii. **DELETE** detail 5/A1.04 that is not used.
5. **SHEET A5.01**
 - i. **REPLACE** sheet with revised dated 11/05/2024.

DRAWINGS – MECHANICAL

1. **SHEET P0.00 – PLUMBING COVERSHEET**
 - a. Plumbing Rough-In Schedule
 - i. **ADD** UR-2 to Plumbing Rough-In Schedule
 - ii. Refer to re-issued sheet
2. **SHEET P1.00 – UNDERFLOOR PLANS - PLUMBING - MAINT**
 - i. **ADD** UR-2 and associated SAN and Vent piping.
 - ii. **ADD** note to 2/P1.00 to read; “REFER TO FINAL ARCHITECTURAL DRAWINGS AND MATCH FIXTURE LOCATIONS AND ADA CLEARANCES.”
 - iii. **ADD** and **REVISE** plumbing tags.
 - iv. Refer to re-issued sheet.
3. **SHEET P3.00 – PLUMBING ENLARGED PLANS**
 - i. **ADD** UR-2 and associated CW and Vent piping.
 - ii. **ADD** WHA-1.
 - iii. **ADD** note to 2/P3.00 to read; “REFER TO FINAL ARCHITECTURAL DRAWINGS AND MATCH FIXTURE LOCATIONS AND ADA CLEARANCES.”
 - iv. **ADD** and **REVISE** plumbing tags.
 - v. **REMOVE** FD-2 serving SH-1.
 - vi. Refer to re-issued sheet.
4. **SHEET P6.00 – PLUMBING SCHEDULES**
 - i. **ADD** UR-2 and WHA-1 to plumbing material list.
 - ii. **REVISE** SH-1 and SH-2 plumbing material list entries.
 - iii. Refer to re-issued sheet.

DRAWINGS – ELECTRICAL

1. **SHEET E0.01**
 - i. **ADD** Cooper McGraw-Edison IST to fixture S1 in the Luminaire Schedule.

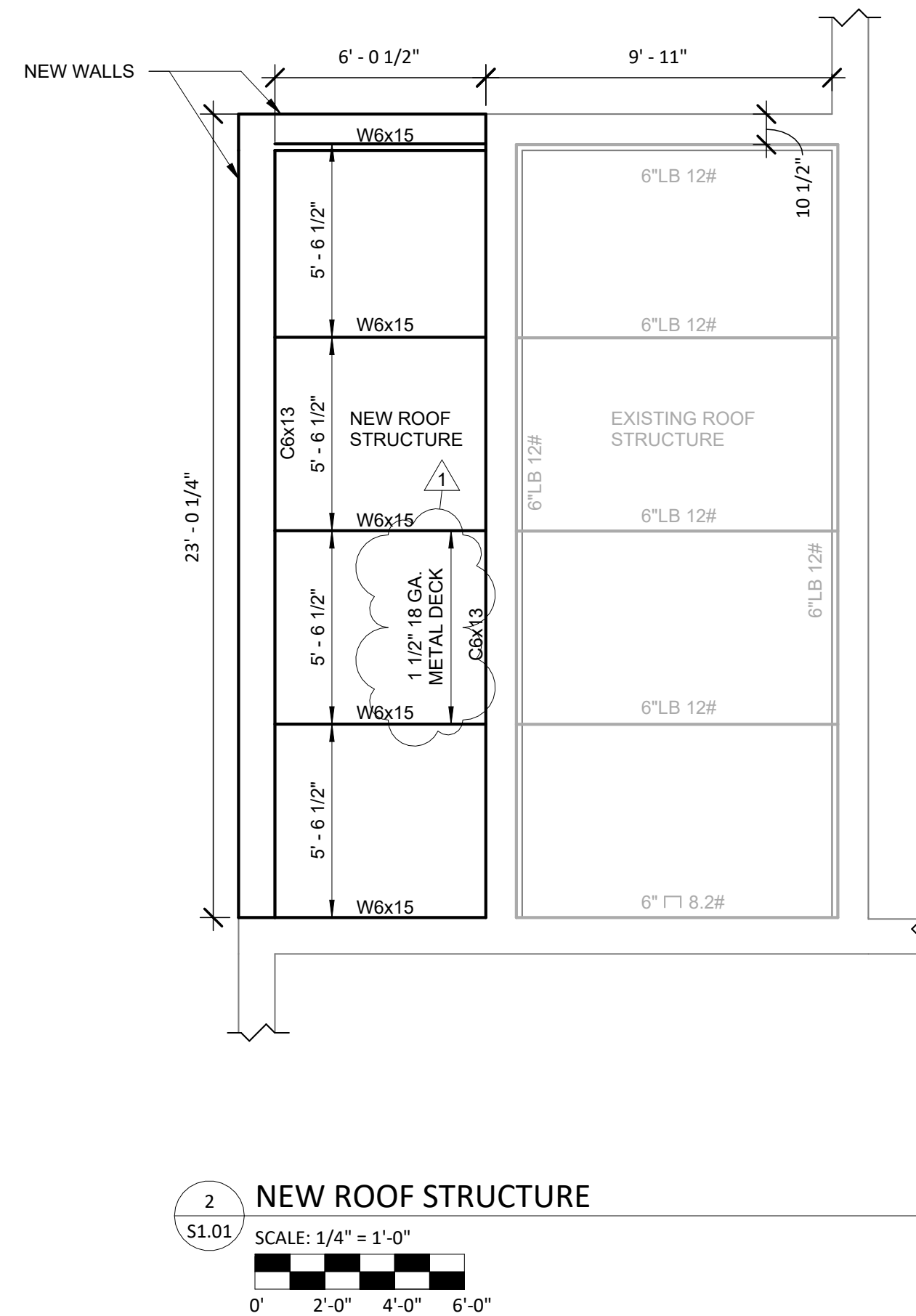
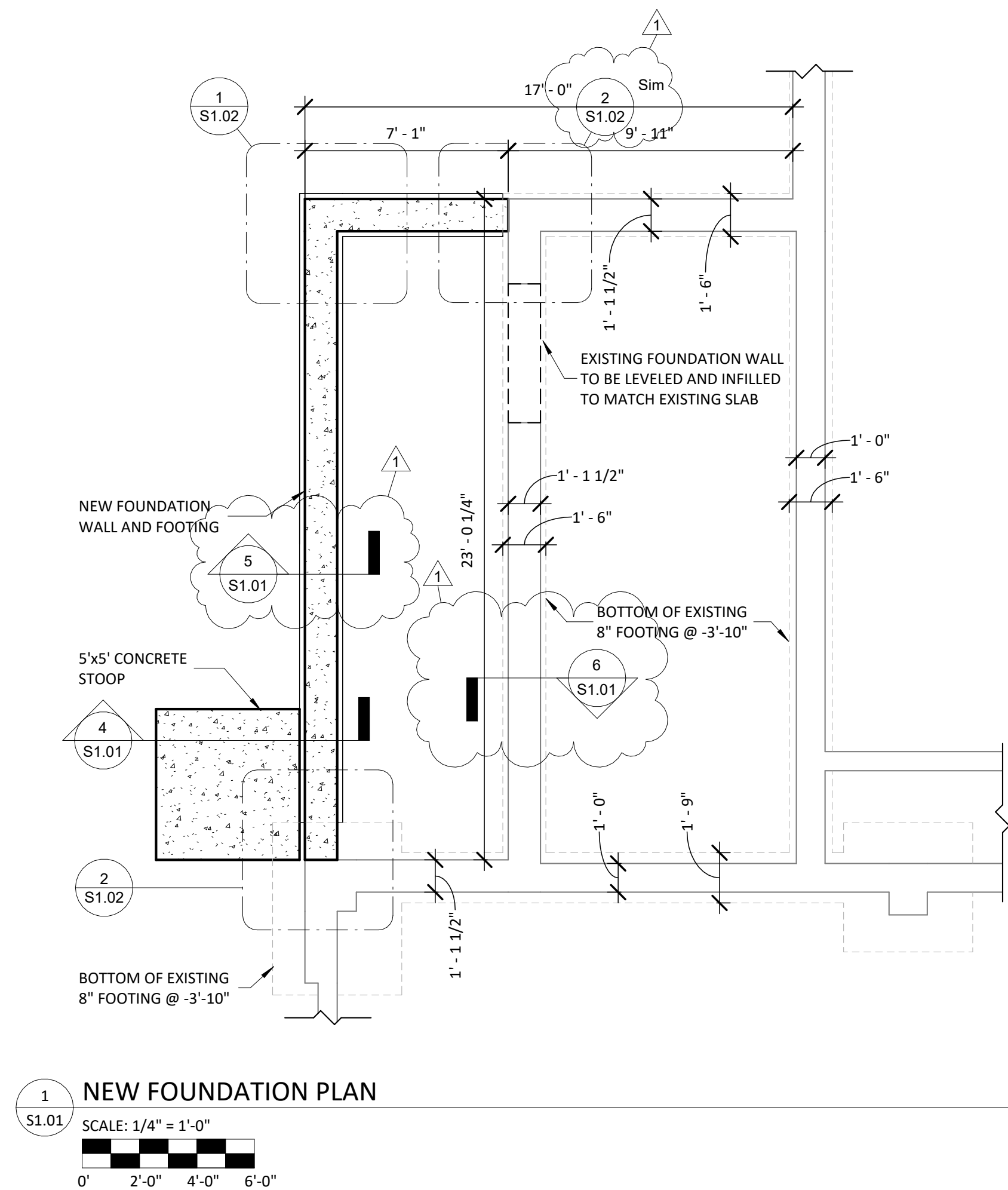
Prepared By: **Willett Hofmann & Associates**



John Gabrielson, AIA

Illinois License No. 001024643

Registration Renewal Date: November 30, 2026



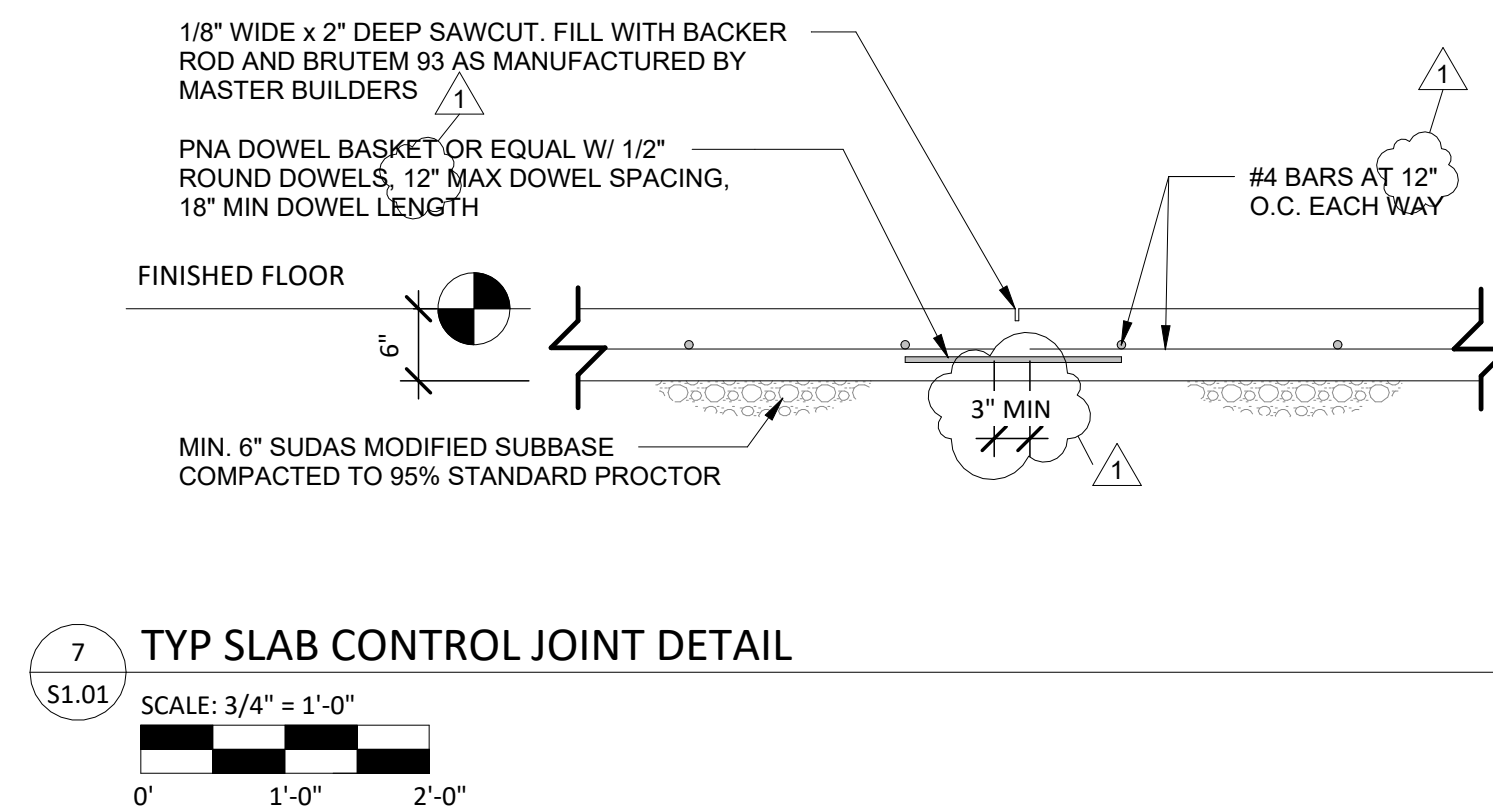
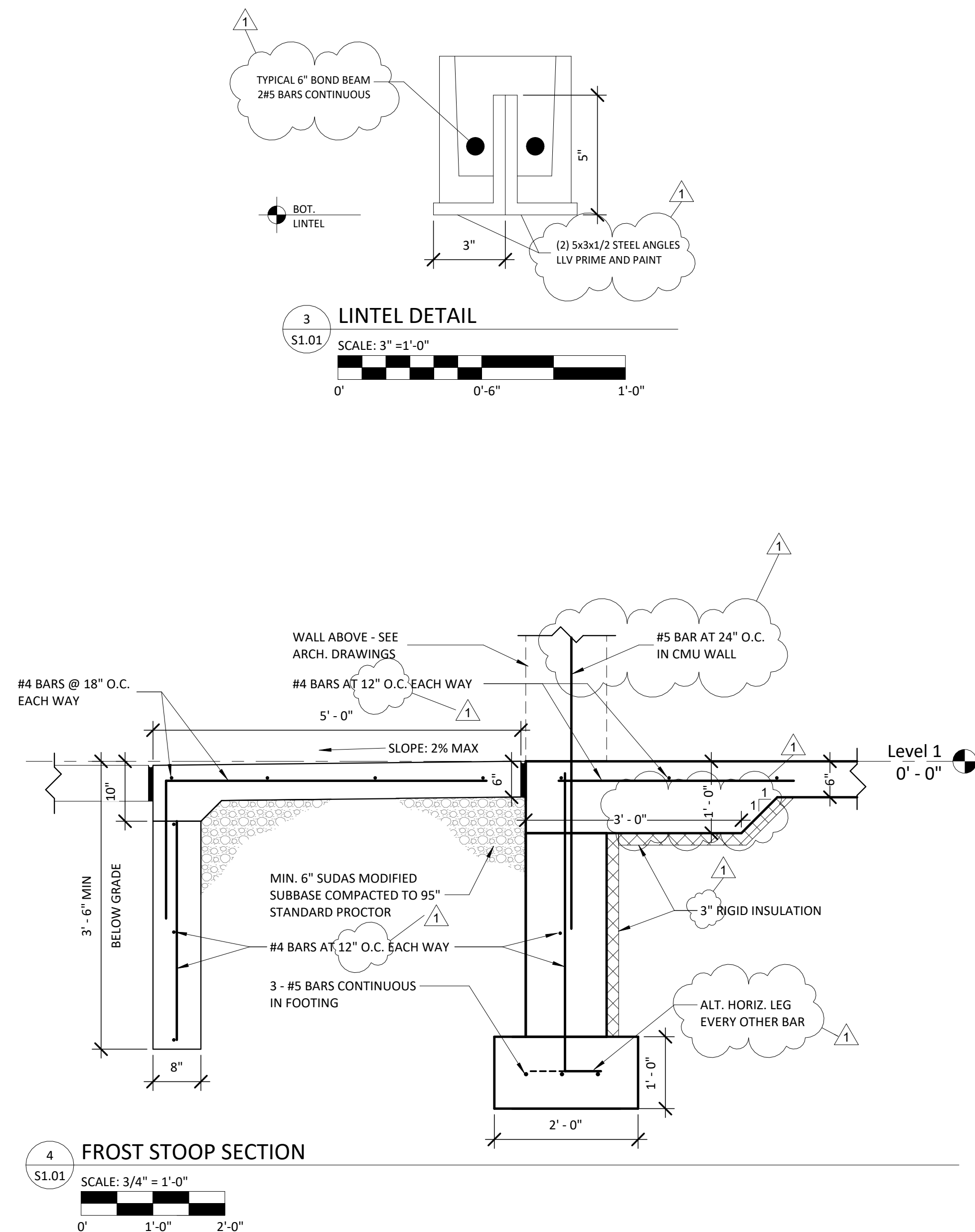
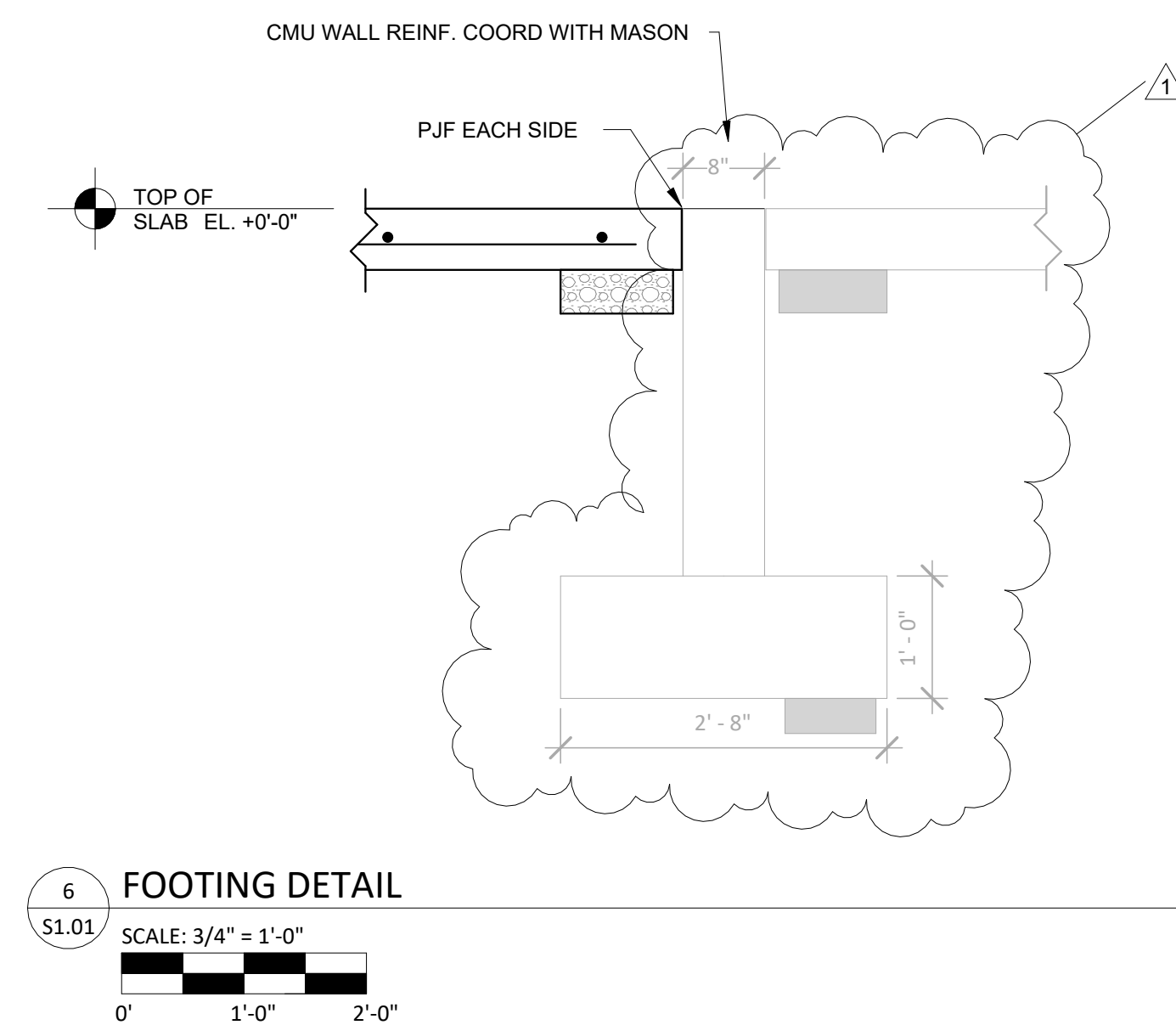
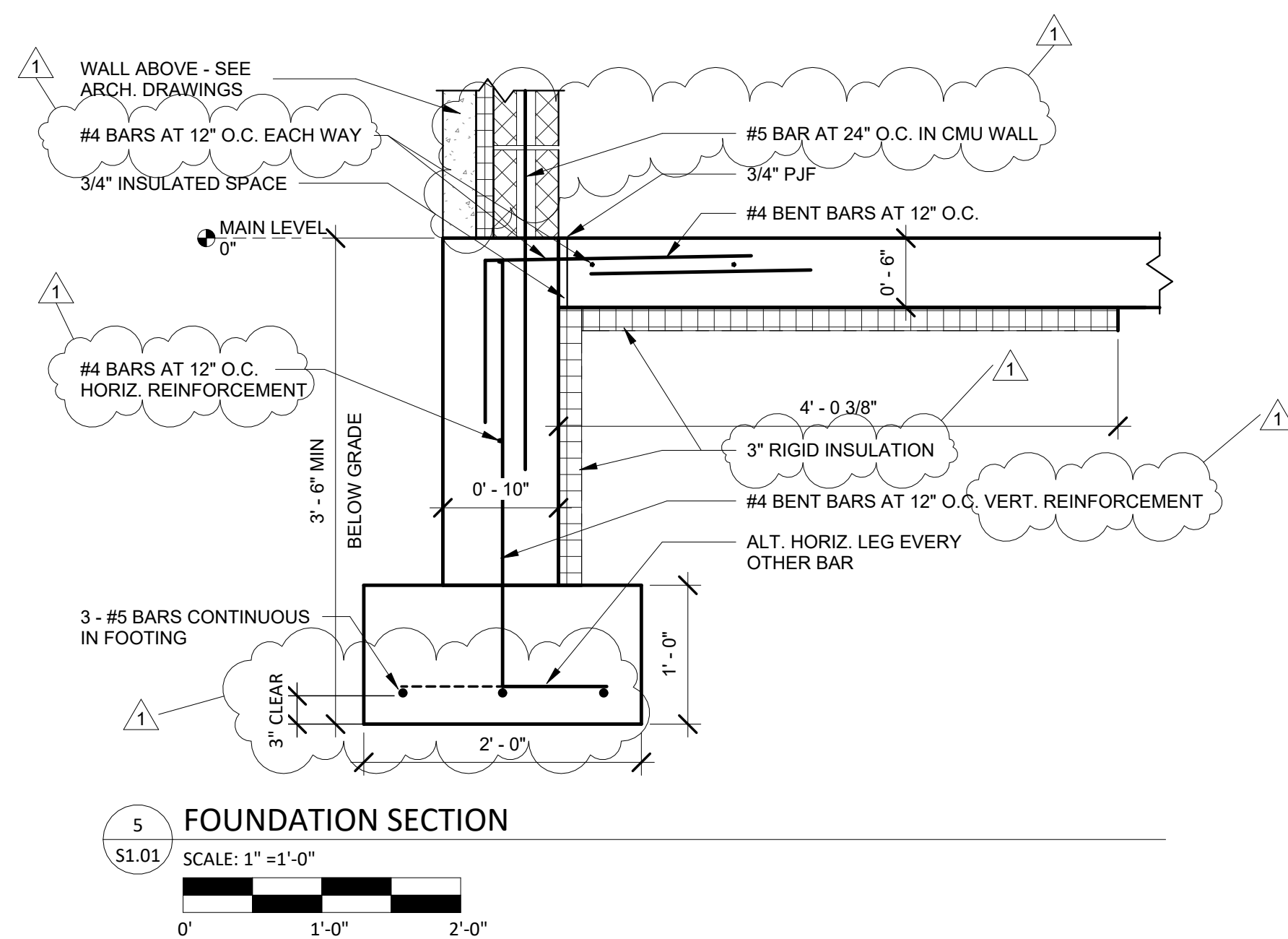
NOTES:

BASIC WIND SPEED: 107 MPH
EXPOSURE CATEGORY: B
RISK CATEGORY: II
GROUND SNOW LOAD: 30 PSF
ROOF LIVE LOAD: 20 PSF
DEAD LOAD: 15 PSF

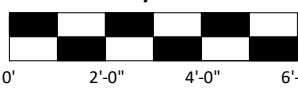
STEEL TO STEEL CONNECTIONS TO BE DESIGNED AND DETAILED BY THE STEEL MANUFACTURER.

SEE DETAIL 6/A1.04 FOR THE CHANNEL TO MASONRY CONNECTION

METAL DECK TO RUN PERPENDICULAR TO STEEL FRAMING MEMBERS.



WILLET HOFMANN & ASSOCIATES INC ENGINEERING ARCHITECTURE LAND SURVEYING 625 32ND AVE. SW CEDAR RAPIDS IA 52404 T: 319-378-1401	DESIGNED	REV.	DATE	BY	REMARKS
	DRAWN				
	REVIEWED				
	APPROVED				
ROCK ISLAND CO MILAN FACILITY 851 10TH AVE W, MILAN, IL 61264 FOUNDATION PLAN					
PHASE ☐ PRELIM ☐ PERMIT ☐ FINAL ☒ BID ☐ CONST					
WHA No. 1854D23					
DATE 11/05/2024					
SHEET No. S1.01					



LOCKER ROOM DEMOLITION KEYNOTES

1. REFERENCED DEMOLITION NOTES REFER TO THE MINIMUM AMOUNT OF DEMOLITION REQUIRED TO ACCOMMODATE THE NEW CONSTRUCTION. TRADE CONTRACTORS SHALL VISIT PROJECT SITE TO BECOME FAMILIAR WITH COMPLETE SCOPE OF REMOVALS/DEMOLITIONS AND FIELD VERIFY THE EXTENT OF DEMOLITION.

2. THE DIMENSIONS AND HATCHED AREAS ARE FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD. THE ACTUAL AREA OF DEMOLITION SHOULD BE KEPT TO THE MINIMUM REQUIRED TO PROPERLY EXECUTE THE CONTRACT REQUIREMENTS.

3. IN THE EVENT THAT AN EXISTING ITEM NOT SHOWN ON THE DRAWINGS CONFLICTS WITH WORK UNDER THIS CONTRACT, CONTACT THE ARCHITECT PRIOR TO REMOVAL OF THAT ITEM.

4. SHUTDOWNS AND HOURS OF OPERATION FOR OTHER OCCUPANCIES. ANY SHUTDOWNS OF BUILDING MUST BE APPROVED BY OWNER AND OCCUR AT OFF HOURS AS DEFINED BY OWNER.

5. THE OWNER HAS FIRST RIGHT OF REFUSAL FOR ALL MATERIAL OR EQUIPMENT IDENTIFIED TO BE REMOVED. ALL ITEMS NOT TURNED OVER TO THE OWNER SHALL BE DISPOSED OF PROPERLY AND LAWFULLY.

6. REFER TO DRAWINGS FOR LOCATIONS OF ALL ITEMS TO BE REINSTALLED. ALL ITEMS NOT SPECIFICALLY INDICATED FOR REINSTALLATION OR DRAWINGS ARE TO BE TURNED OVER TO THE OWNER. ALL ITEMS NOT TURNED OVER TO THE OWNER SHALL BE DISPOSED OF PROPERLY AND LAWFULLY.

7. ALL REMOVED ITEMS IDENTIFIED FOR REINSTALLATION OR TO BE TURNED OVER TO THE OWNER SHALL BE PROTECTED UNTIL TIME OF REINSTALLATION OR OWNER POSSESSION. DAMAGED ITEMS SHALL BE REPAIRED OR REPLACED BY THE RESPONSIBLE TRADE CONTRACTOR.

8. THROUGHOUT DEMOLITION AND CONSTRUCTION, PROTECT ITEMS SCHEDULED TO REMAIN AND/OR ALL ADJACENT MATERIALS AND EQUIPMENT, ETC. INDICATED TO REMAIN. COORDINATE REMOVAL AND PROTECTIONS WITH OWNER.

9. COORDINATE WITH OWNER ACCESS AND LOCATIONS OF TEMPORARY PARTITION. TEMPORARY PARTITION MUST BE DUSTPROOF. AT REMOVAL OF SELECTED DEMOLITION ITEMS WHERE NO NEW CONSTRUCTION IS IDENTIFIED, PATCH, CLEAN, PREPARE, AND PAINT SURFACES TO MATCH FINISH COLOR, TEXTURE AND SHEEN OF ADJACENT SURFACES.

10. FINISHES TO BE REMOVED, INCLUDING ALL ASSOCIATED BRACKETS, FASTENERS, ANCHORS, ETC. PATCH, CLEAN, PREPARE, AND PAINT SURFACES TO MATCH FINISH COLOR, TEXTURE AND SHEEN OF ADJACENT SURFACES.

11. PATCH ALL CEILINGS, WALLS AND FLOORS WHERE MECHANICAL, ELECTRICAL, TECHNOLOGY, PLUMBING AND FIRE PROTECTION COMPONENTS ARE TO BE REMOVED IN AN EXISTING CEILINGS, WALLS OR FLOORS TO REMAIN.

12. ALL WALL DEMOLITION SHALL HAVE CLEAN, VERTICAL, SMOOTH CUTS. PATCH, REPLACE AND/OR FILL VOIDS IN WALLS TO REMAIN TO PROVIDE A SMOOTH SURFACE FOR THE APPLICATION OF NEW FINISH MATERIAL.

13. WHEN REMOVING EXISTING WALL, TILE, FLOOR, TILE, RUBBER BASE OR CEILING TILE, REMOVE FINISHES TO THE NEAREST JOINT WHICH ABUTS TILE NOT AFFECTED BY THE CONSTRUCTION. PROTECT THE SURFACES AND EDGES OF EXISTING FINISHES TO REMAIN.

14. AT AREAS WHERE DEMOLITION OF THE FLOORING EXPOSES THE CONCRETE SUBSTRATE, COMPLETELY REMOVE THE MASTIC AND FILL ALL CRACKS AND SPALLED AREAS IN PREPARATION FOR NEW FLOORING MATERIAL. REMOVAL OF FLOORING MATERIAL INCLUDES REMOVAL OF ADJACENT WALL BASE MATERIAL.

15. AT IDENTIFIED AREAS OF SPALLS OR UNEVEN AND/OR SEPARATED CONCRETE SLABS, REMOVE ALL LOOSE MATERIAL, GRIND CONCRETE TO ACHIEVE A LEVEL SURFACE AND FILL CRACKS AND SPALLED AREAS IN PREPARATION FOR INSTALLATION OF FINISHED FLOORING.

16. CONTRACTOR SHALL REMOVE EXISTING PLUMBING, MECHANICAL, ELECTRICAL OR OTHER MISCELLANEOUS ITEMS REQUIRED TO COMPLETE NEW WORK BUT NOT REQUIRED TO REMAIN.

17. WHEN REMOVING INTERIOR OR EXTERIOR WALL ASSEMBLIES, CONTRACTOR SHALL ALSO REMOVE ALL ASSOCIATED POWER AND DATA DEVICES, ETC. CONTRACTOR SHALL REMOVE ALL MECHANICAL, ELECTRICAL OR OTHER MEPPF WHERE REQUIRED TO MAINTAIN FUNCTIONING SYSTEMS. REMOVE ABANDONED MEPPF SYSTEMS TO SOURCE AND CAP APPROPRIATELY. REFER TO MECHANICAL, ELECTRICAL, TECHNOLOGY, LOW VOLTAGE PLUMBING AND FIRE PROTECTION DRAWINGS FOR ADDITIONAL INFORMATION.

18. CONTRACTOR SHALL REMOVE ALL DEBRIS AND TRASH RESULTING FROM CONSTRUCTION ON A DAILY BASIS.

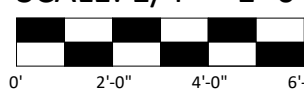
19. GENERAL CONTRACTOR SHALL RECYCLE DEMOLITION CONSTRUCTION DEBRIS IN ACCORDANCE WITH AUTHORITIES HAVING JURISDICTION AND SUSTAINABLE BEST PRACTICES.

20. IN THE EVENT HAZARDOUS MATERIALS ARE UNCOVERED GENERAL CONTRACTOR IS TO NOTIFY THE OWNER AND THE APPROPRIATE AUTHORITIES. THE ARCHITECT IS NOT RESPONSIBLE FOR REMOVAL / ABATEMENT OF HAZARDOUS MATERIALS. CONTRACTOR TO PROVIDE REMOVAL / ABATEMENT AT LOCATIONS NECESSARY.

21. REFER TO THE CIVIL, LANDSCAPE, STRUCTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION, ELECTRICAL, AND TECHNOLOGY DRAWINGS FOR THE DEMOLITION WORK SPECIFIC TO THOSE DISCIPLINES.

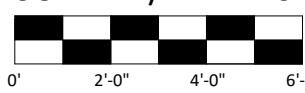
22. STRUCTURAL ITEMS SHOWN AS TO BE REMOVED ARE FOR REFERENCE ONLY. VERIFY APPROPRIATE SHORING OR REINFORCEMENT CONDITION WITH STRUCTURAL DRAWINGS.

EPT3 MFG: SHERWIN WILLIAMS
COLOR: SW70007 CEILING BRIGHT
WHITE (CEILING PAINT)

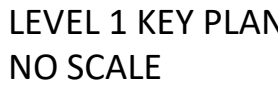


LOCKER ROOM KEYNOTES

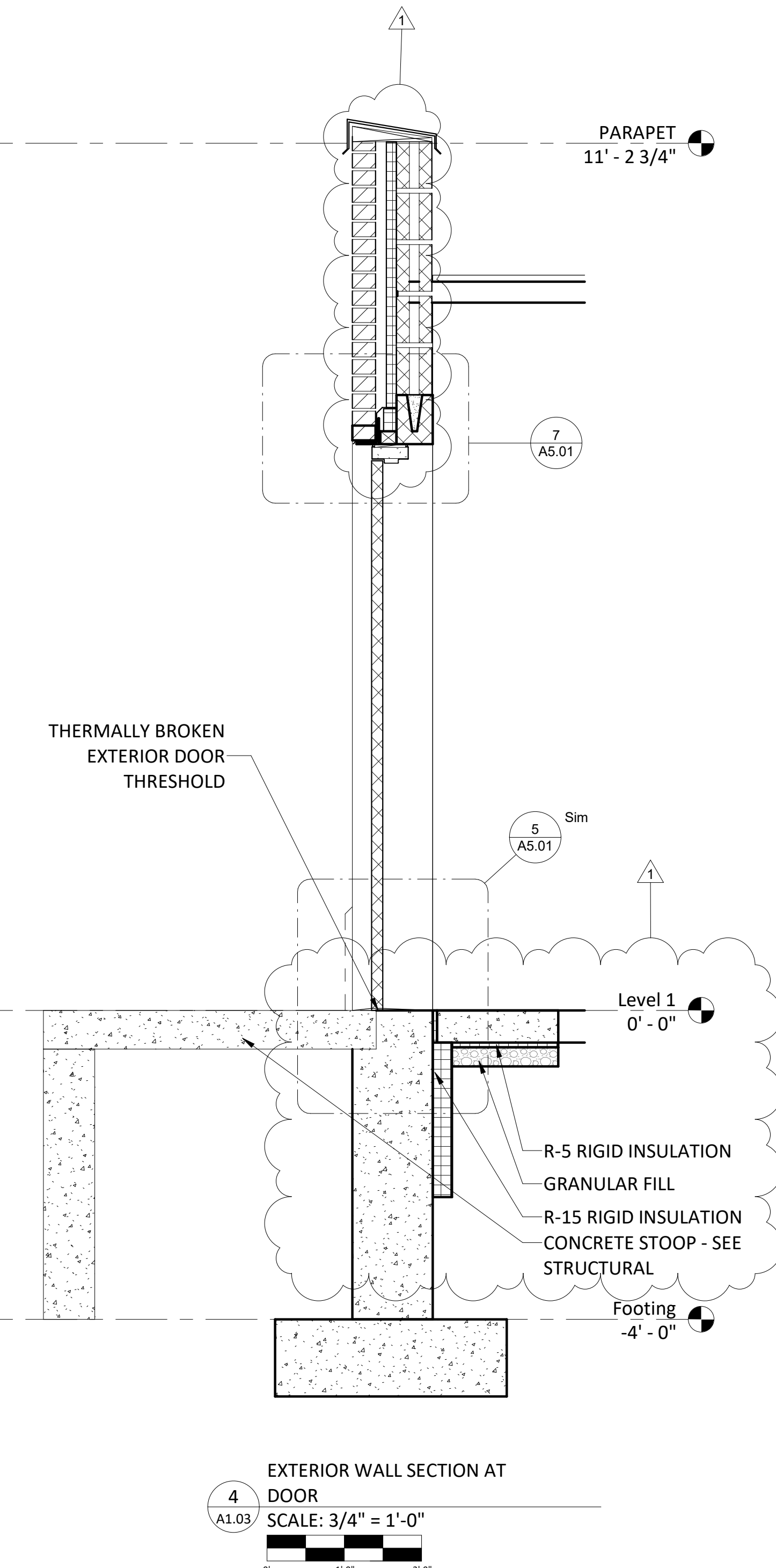
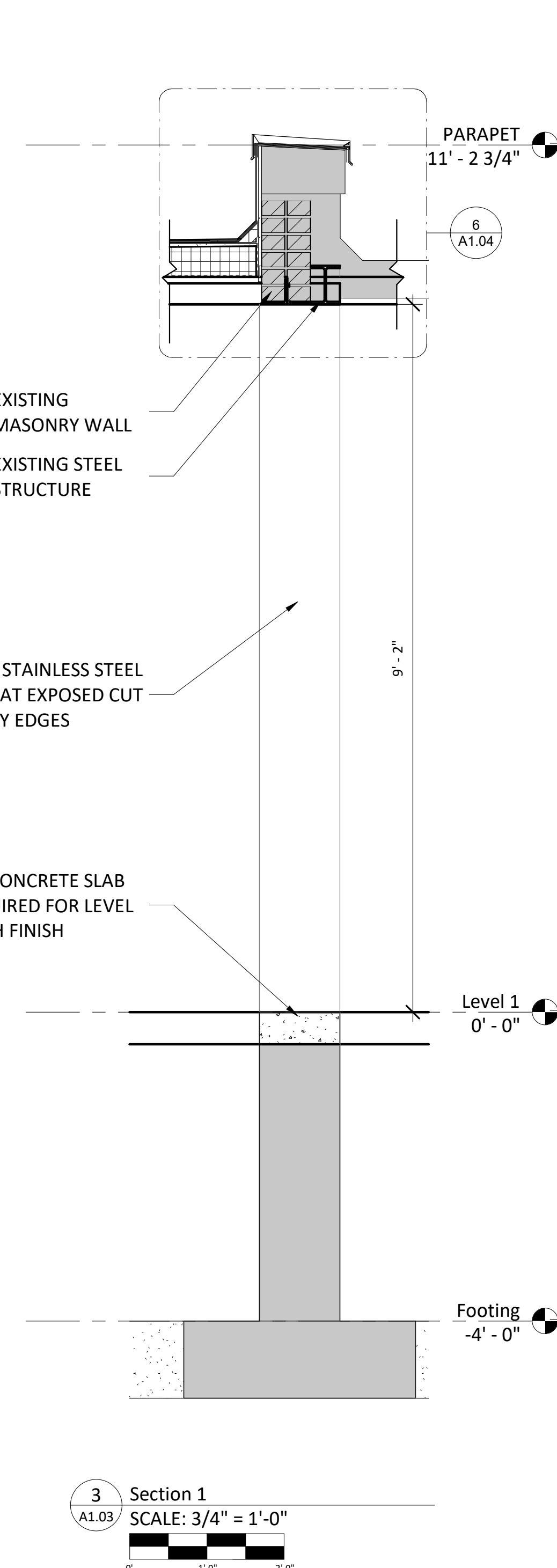
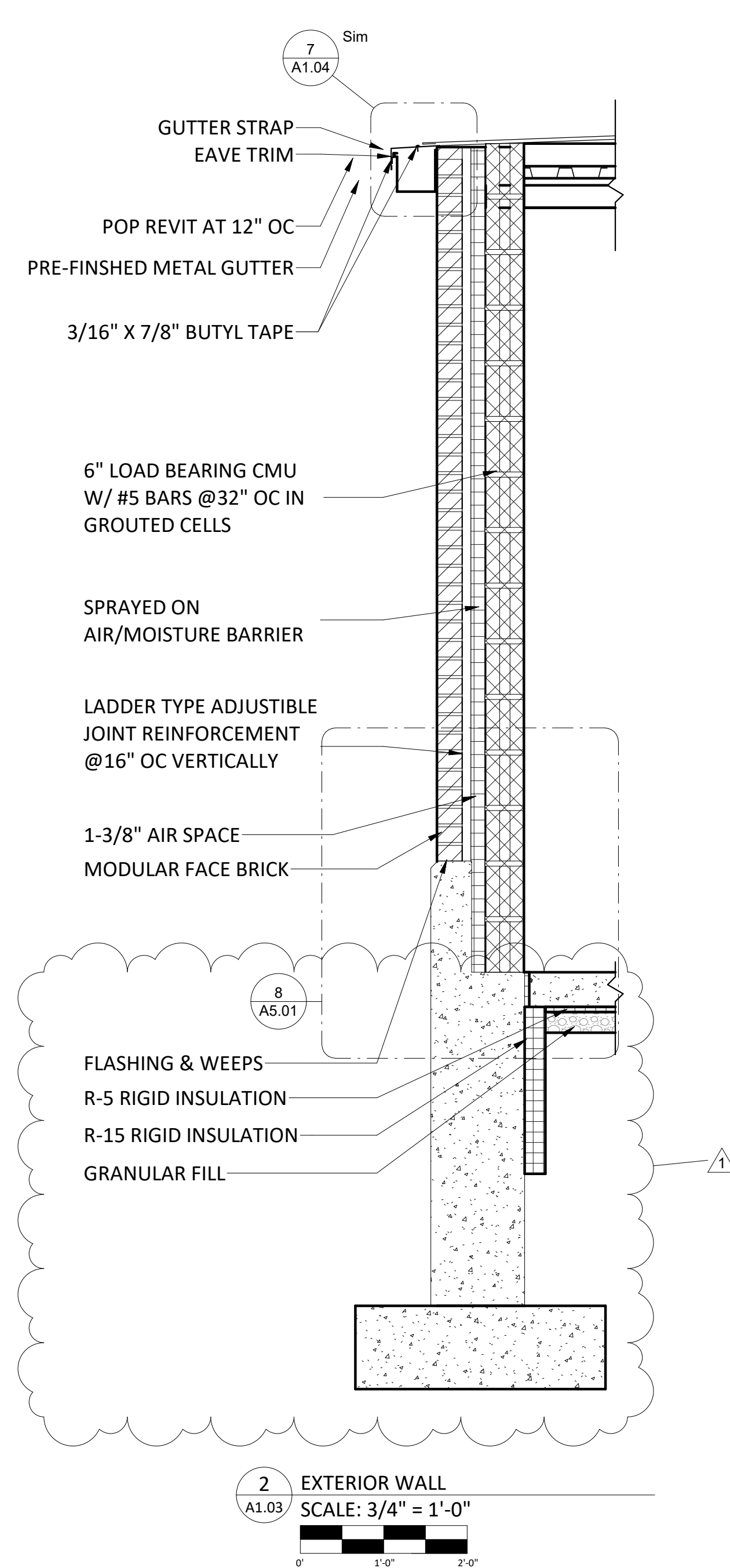
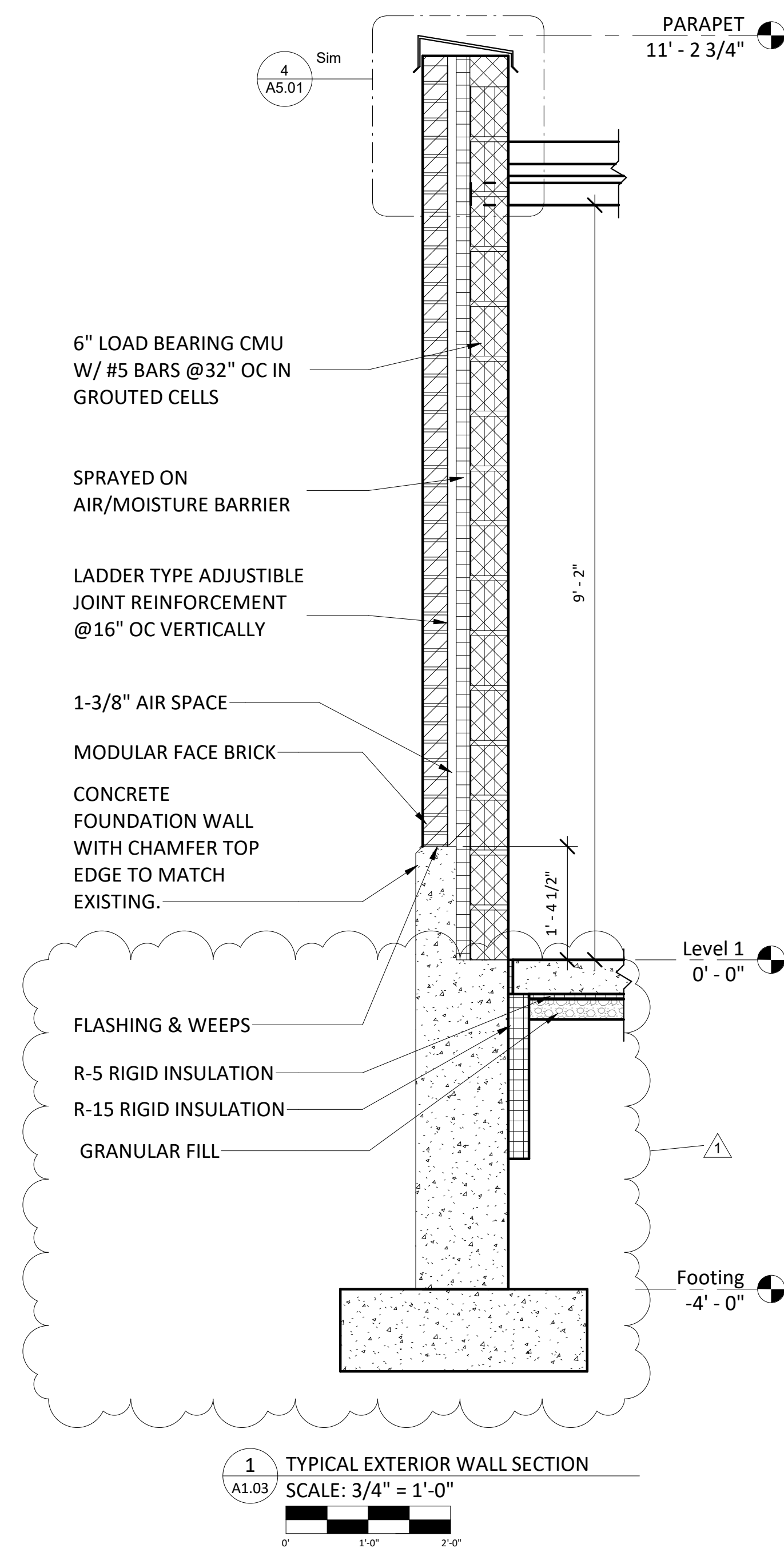
1. DIMENSIONS MUST BE VERIFIED IN THE FIELD ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE PROCEEDING WITH THE AFFECTED WORK.
2. DO NOT SCALE THE DRAWINGS.
3. THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH SITE CONDITIONS AS THEY MAY AFFECT CARRYING OUT ALL WORK AS DESCRIBED IN THESE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INVESTIGATE, VERIFY, AND BE RESPONSIBLE FOR ALL CONDITIONS OF THE PROJECT, AND NOTIFY THE ARCHITECT OF ANY CONDITIONS THAT REQUIRE MODIFICATION BEFORE PROCEEDING WITH THE WORK.
4. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, LABOR AND SERVICES NECESSARY TO COMPLETE THE WORK.
5. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE BUILDING CODES AS ADOPTED BY THE CITY OF ROCK ISLAND.
6. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL TRADES AND THE PREVENTION OF CONFLICT AMONG ALL TRADES.
7. ARCHITECTURAL DRAWINGS MUST ALWAYS BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTS, ANY DISCREPANCY BETWEEN THESE DRAWINGS AND OTHER DOCUMENTS SHOULD BE REPORTED TO THE ARCHITECT FOR CLARIFICATION AND VERIFICATION PRIOR TO COMMENCEMENT OF AFFECTED WORK.
8. PROVIDE SEALANT AT ALL JOINTS, CRACKS THAT OCCUR WHERE DISSIMILAR MATERIALS INTERSECT PERPENDICULAR TO EACH OTHER AND THE INTERSECTION IS EXPOSED TO VIEW, UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
9. PAINT ALL EXPOSED STRUCTURE UNLESS NOTED OTHERWISE.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY BRACING AND SHORING REQUIRED DURING CONSTRUCTION.
11. ALL WORK AND MATERIAL SHALL BE REGARDED AS NEW UNLESS SPECIFICALLY INDICATED AS "EXISTING" ON THE DRAWINGS.
12. PORTABLE FIRE EXTINGUISHERS TO BE PROVIDED PER I.F.C. 906 AND/OR THE LOCAL AUTHORITY HAVING JURISDICTION. EXTINGUISHERS TO BE MAINTAINED BY THE OWNER.



1. ALL CEILING ELEVATIONS IDENTIFIED DENOTE HEIGHT ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE.
2. REFER TO MECHANICAL, PLUMBING, ELECTRICAL, FIRE PROTECTION, AND TECHNOLOGY DRAWINGS BY OTHERS FOR CEILING MOUNTED EQUIPMENT AND COMPONENTS NOT IDENTIFIED ON ARCHITECTURAL DRAWINGS.
3. PRIOR TO BEGINNING ANY WORK, NOTIFY THE ARCHITECT IF EXISTING CONDITIONS PREVENT NEW CEILING SYSTEMS FROM BEING INSTALLED AS DRAWN AND NOTED.
5. LIGHT FIXTURES ARE TO BE CENTERED IN THE WIDTH OF THE ROOMS WHEREVER POSSIBLE.



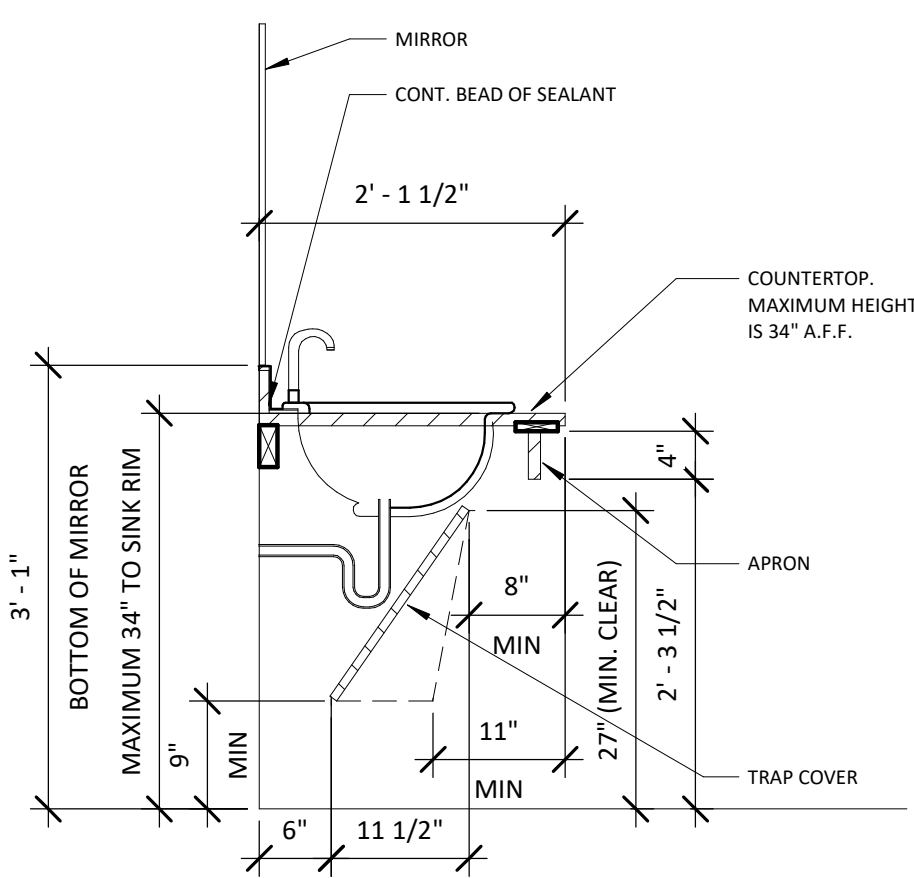
SHEET
No.
A1.01



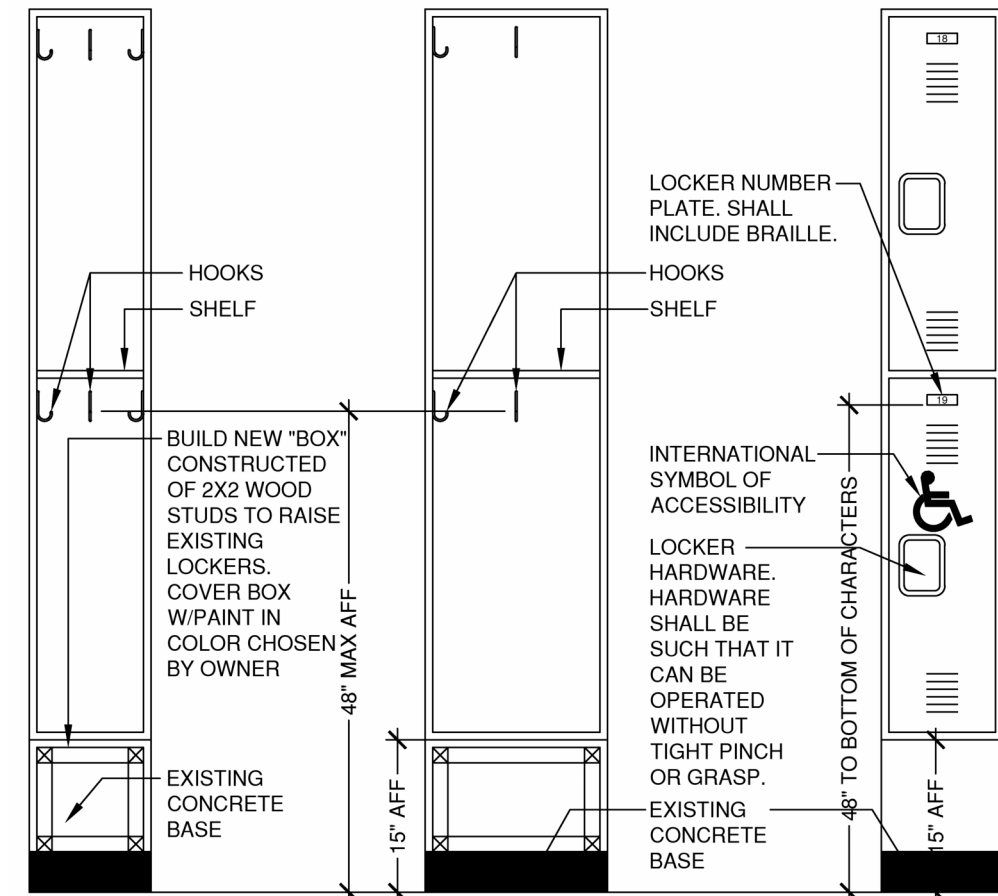
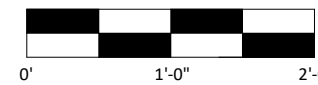
REV.	DATE	BY	REMARKS
DESIGNED			
DRAWN			
REVIEWED			
APPROVED			

WILLET HOFMANN & ASSOCIATES, INC. ENGINEERING ARCHITECTURE LAND SURVEYING 625 32ND AVE SW CEDAR RAPIDS, IA 52404 1-319-378-1401	ROCK ISLAND CO MILAN FACILITY 851 10TH AVE W MILAN, IL 61264 WALL SECTIONS	© Copyright 2024 Willett, Hofmann & Associates, Inc. and may not be copied or used by any person without written permission.

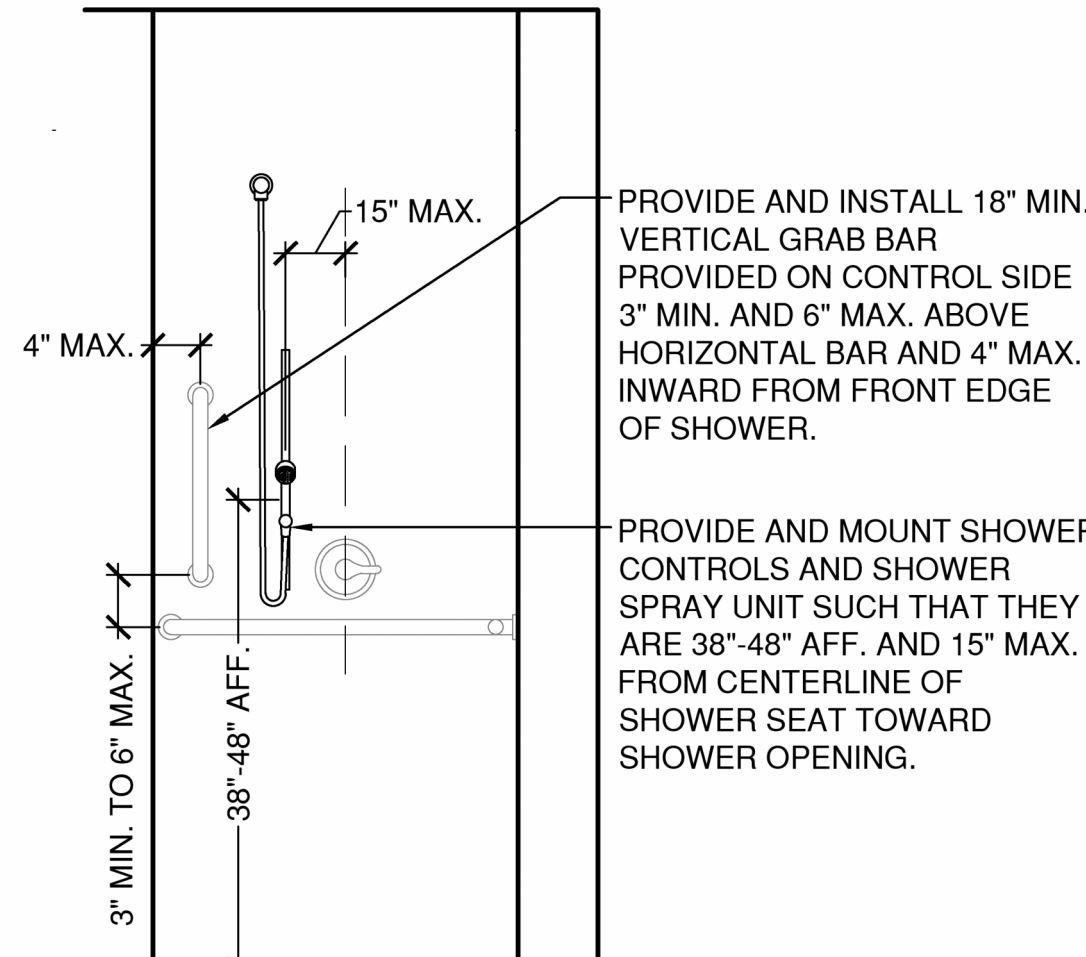
PHASE ☐ PRELIM ☐ PERMIT ☐ FINAL ☒ BID ☐ CONST	WHA No. 1854D23	DATE 11/05/2024
SHEET No. A1.03		



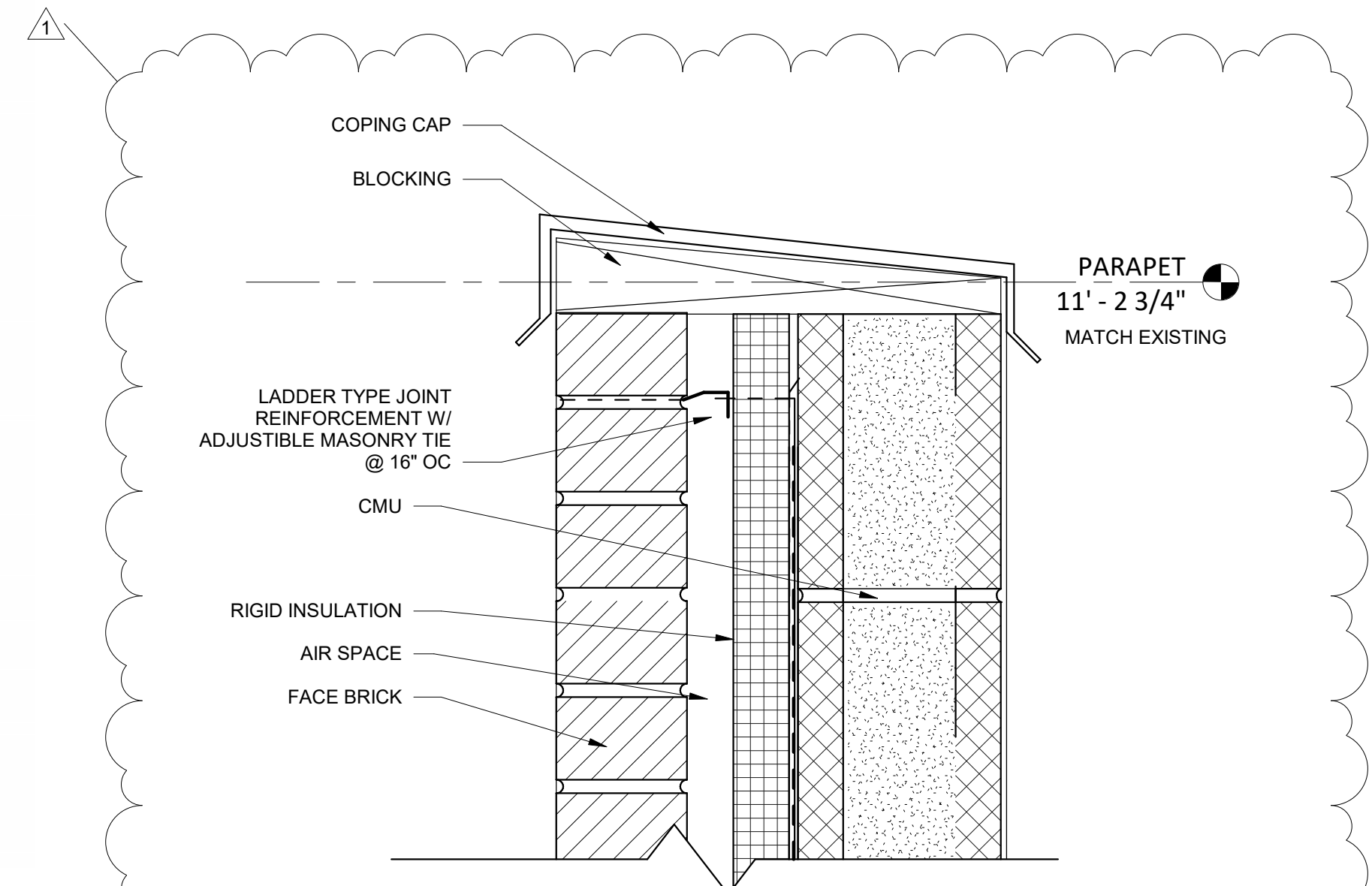
1 ADA VANITY
SCALE: 3/4" = 1'-0"



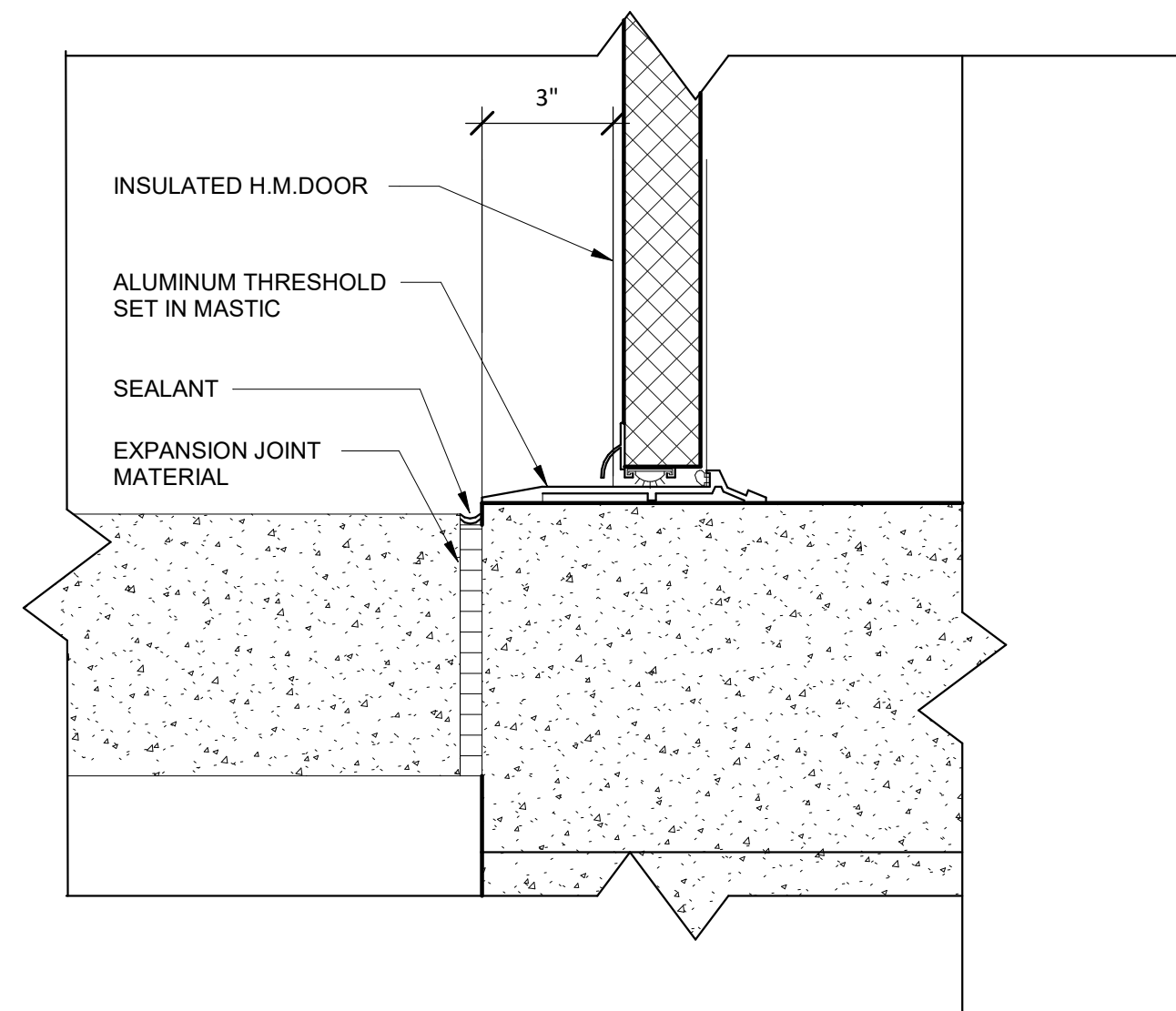
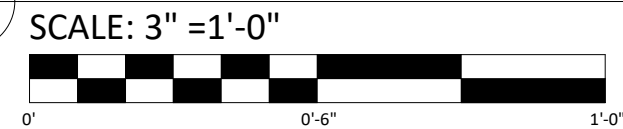
2 ADA LOCKERS
NO SCALE



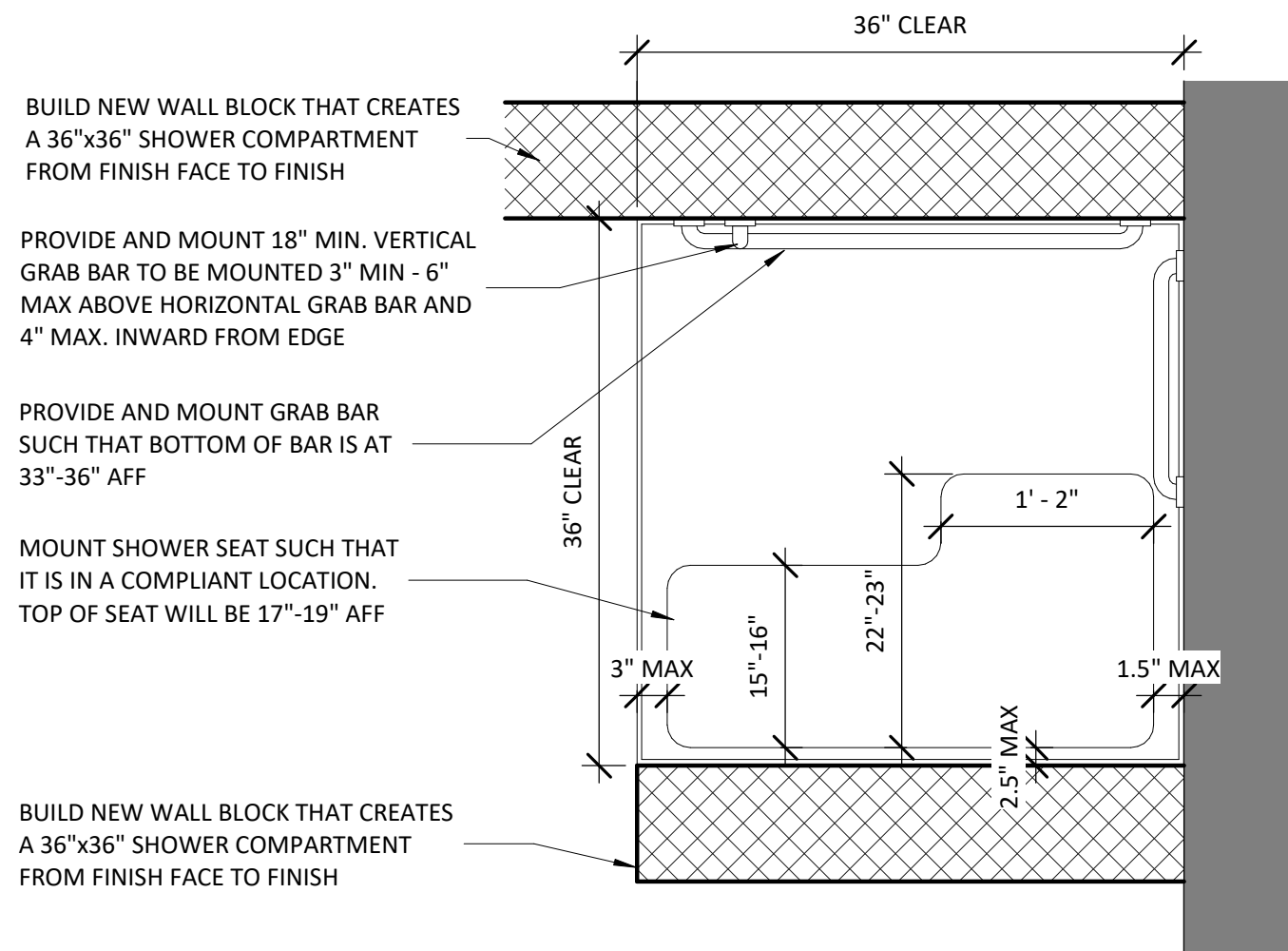
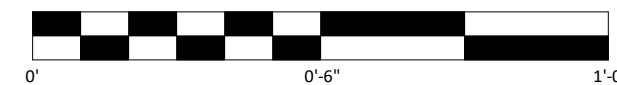
3 ADA SHOWER ELEVATION
NO SCALE



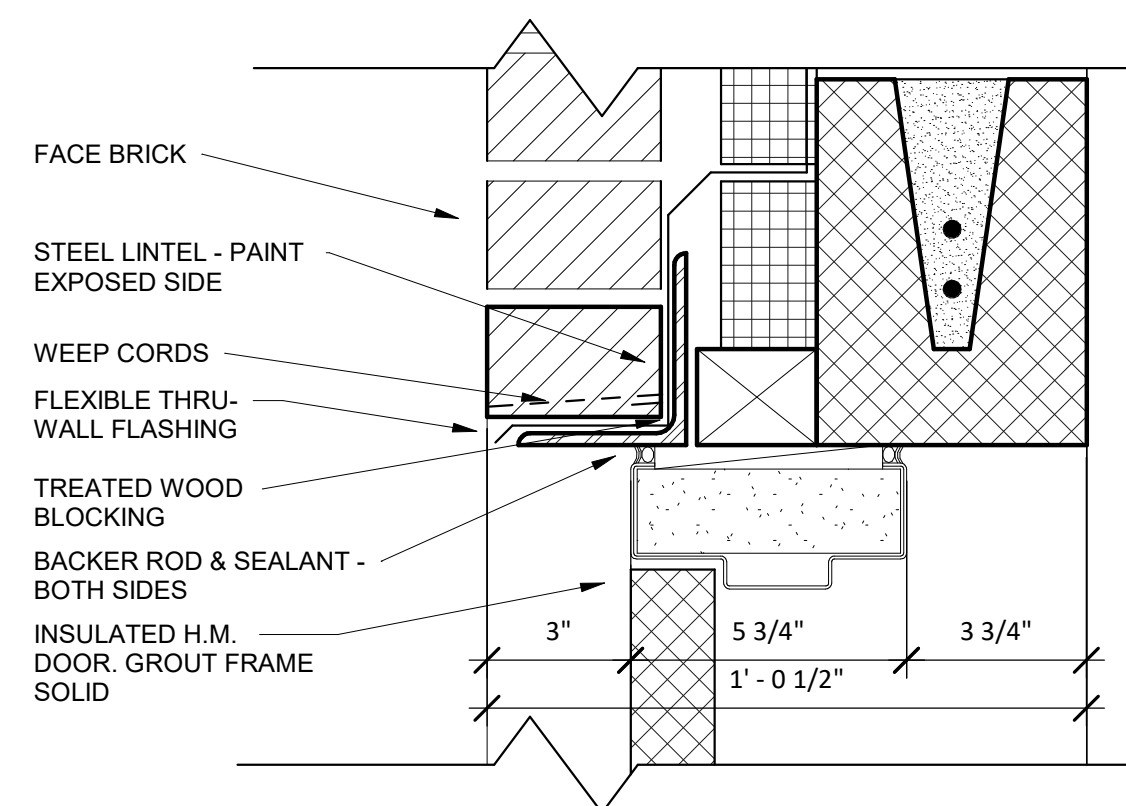
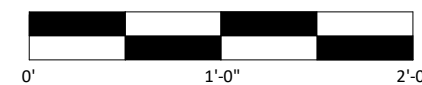
4 WINDOW HEAD/PARAPET
SCALE: 3" = 1'-0"



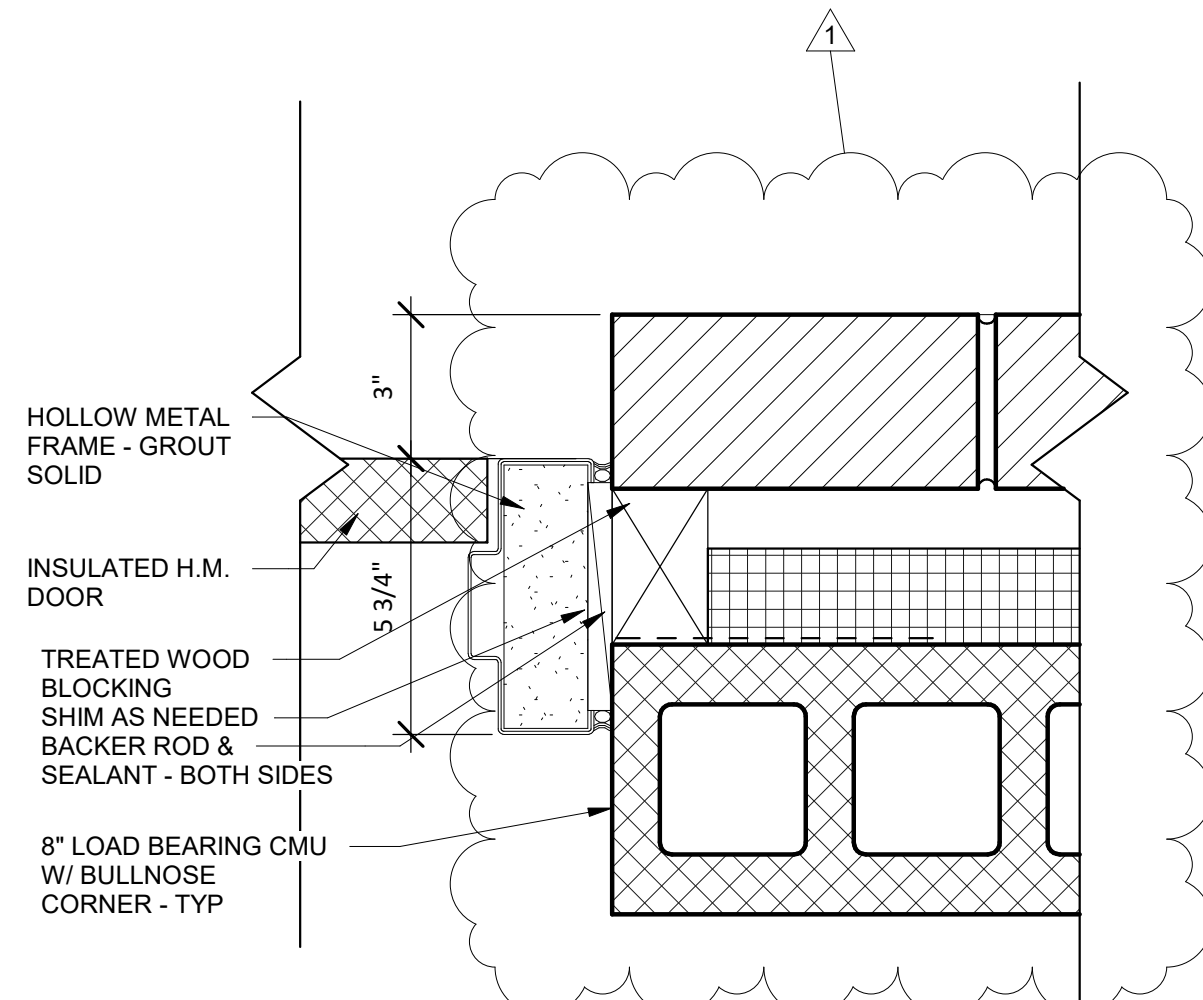
5 H.M. DOOR SILL DETAIL
SCALE: 3" = 1'-0"



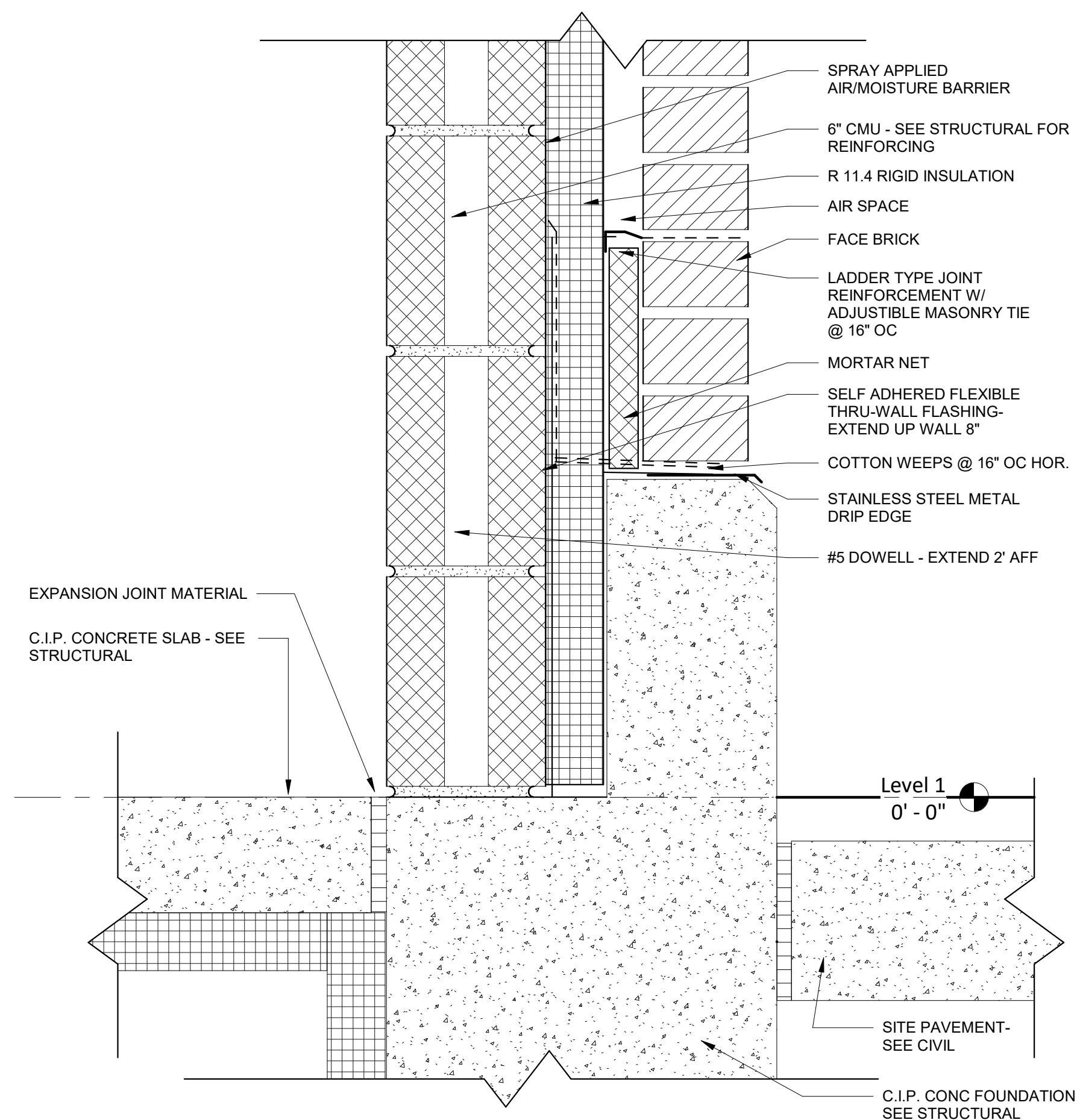
6 ADA SHOWER
SCALE: 1" = 1'-0"



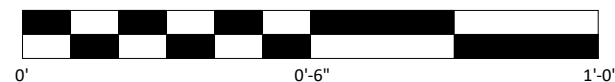
7 NEW EXTERIOR DOOR HEAD
SCALE: 3" = 1'-0"



9 H.M. DOOR JAMB DETAIL
SCALE: 3" = 1'-0"



8 WALL BASE
SCALE: 3" = 1'-0"



REMARKS

BY

DATE

REV.

DESIGNED

DRAWN

REVIEWED

APPROVED

WILLETT HOFMANN
& ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SURVEYING
625 32ND AVE SW CEDAR RAPIDS, IA 52404
1-319-378-1401



ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W. MILAN, IL 61264
DETAILS

PHASE

- ☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

DATE
11/05/2024

SHEET
No.
A5.01

This document is the copyrighted property of Willett Hofmann & Associates, Inc. and may not be copied or used by any person without written permission. © Copyright © Willett Hofmann & Associates, Inc.

VIEW KEY

NAME

LEVEL NAME

10'-0"

HEIGHT ABOVE PROJECT 0'-0"

1

KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL

INDICATES DIRECTION OF TRUE NORTH

PLAN OR DETAIL NUMBER

PLAN OR DETAIL NAME

1/8" = 1'-0"

PLAN OR DETAIL SCALE

VIEW NAME

1

INDICATES SIMILAR DETAIL REFERENCED IN MULTIPLE LOCATIONS

DETAIL REFERRED TO BY SECTION CUT

SHEET DETAIL IS LOCATED ON

SIM

M101

T101

LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
NEW
----- EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
----- NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
EXISTING
----- EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
----- EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG-E TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

APPLICABLE CODES	
CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:	
BUILDING CODE:	IBC 2021 EDITION
FIRE CODE:	IFC 2021 EDITION
PLUMBING CODE:	ILLINOIS PLUMBING CODE 2014 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LIFE SAFETY CODE:	NFPA 101 CURRENT EDITION
ENERGY CONSERVATION CODE:	IECC 2021
HEALTH DEPARTMENT CODE:	CURRENT EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

CONTRACTOR ABBREVIATION KEY	
ABBR:	DESCRIPTION:
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
H.C.	HEATING CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
T.C.C.	TEMPERATURE CONTROLS CONTRACTOR
V.C.	VENTILATION CONTRACTOR

CONTACT PERSONS:	
DESCRIPTION:	PERSON:
PROJECT MANAGER	MATT SYNDER
MECHANICAL	ZACH MANARY
ELECTRICAL	JEREMY VETTING

PLUMBING SLOPE REQUIREMENTS:	
BASED ON ILLINOIS PLUMBING CODE	
INTERIOR: SANITARY WASTE:	≤2-1/2"ø=1/4" PER FOOT ≥3"ø = 1/8" PER FOOT ≥8"ø = 1/16" PER FOOT
CONDENSATE AND INDIRECT DRAINAGE:	1/8" PER FOOT
SANITARY VENT:	NO SPECIFIC PITCH, PITCH TO FIXTURES
DOMESTIC WATER:	NO SPECIFIC PITCH, PITCH TO FIXTURES

PLUMBING SYMBOL LIST	
NOT ALL SYMBOLS MAY APPLY.	
SYMBOL:	DESCRIPTION:
—CW—	COLD WATER - POTABLE
—D—	DRAIN
—HW—	HOT WATER - POTABLE
—HWC—	HOT WATER CIRCULATING - POTABLE
—SAN—	SANITARY DRAINAGE
—V—	VENT
	PIPE CONTINUATION
	PIPE CAP
	PIPE DOWN
	PIPE UP OR UP/DOWN
	PIPE SERVING FIXTURE ON FLOOR ABOVE (EXAMPLE: FD = FLOOR DRAIN)
	PITCH PIPE IN DIRECTION
	DIRECTION OF FLOW IN PIPE
	ROUTE TO DRAIN
	DIELECTRIC CONNECTION
	UNION/FLANGE
	SHUTOFF VALVE NORMALLY OPEN
	SHUTOFF VALVE NORMALLY CLOSED
	BALANCING VALVE (NUMBER INDICATES GPM)
	CHECK VALVE
	VACUUM BREAKER
	PRESSURE GAUGE (FURNISHED WITH BALL VALVE)
	THERMOMETER WITH WELL (FILLED TYPE)
	REDUCER - REFERENCE SPECIFICATION FOR CONCENTRIC/ECCENTRIC AND FOT/F08

MECHANICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING, VENTILATION, PIPING, AND TEMPERATURE CONTROL.

- EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE BEGINNING WORK.
- NOT ALL EXISTING DUCTWORK AND PIPING IS SHOWN. VERIFY EXISTING CONDITIONS BEFORE STARTING WORK. NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.
- FIELD VERIFY THE AVAILABLE CLEARANCES FOR DUCTWORK AND PIPING BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
- EACH CONTRACTOR SHALL CUT AND PATCH ROOFS, WALLS, AND FLOORS ASSOCIATED WITH THEIR WORK.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF CEILINGS, CEILING TILES, AND CEILING GRIDS ASSOCIATED WITH AREAS OF WORK BY ALL CONTRACTORS. NOTIFY THE GENERAL CONTRACTOR OF AFFECTED AREAS PRIOR TO BIDDING.
- WHERE EXISTING MECHANICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, PIPING, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING MECHANICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.
- PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS THAT REMAIN ACTIVE.
- OBTAIN PERMISSION FROM OWNER BEFORE SHUTTING DOWN ANY SYSTEM FOR ANY REASON. MAINTAIN SERVICE TO ALL COMPONENTS THAT ARE TO REMAIN UNTIL NEW SYSTEMS ARE INSTALLED.
- MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR TIE IN AND SWITCHOVER. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM OWNER BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MAKE CHANGEOVER TO NEW SYSTEMS WITH MINIMUM OUTAGE.
- DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED.

PLUMBING SHEET INDEX	
P0.00	PLUMBING COVERSHEET
P1.00	UNDERFLOOR PLANS - PLUMBING - MAINT
P1.00A	UNDERFLOOR PLANS - PLUMBING - ADMIN
P1.01	LEVEL 1 PLANS - PLUMBING - MAINT
P1.01A	LEVEL 1 PLANS - PLUMBING - ADMIN
P1.02	LEVEL 2 PLANS - PLUMBING - MAINT
P3.00	PLUMBING ENLARGED PLANS
P3.01	PLUMBING ENLARGED PLANS
P3.02	PLUMBING ENLARGED PLANS
P4.00	PLUMBING DETAILS
P6.00	PLUMBING SCHEDULES
GRAND TOTAL: 11	

PLUMBING ABBREVIATION KEY	
ABBR:	DESCRIPTION:
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
BT	BATHTUB
CO	CLEANOUT
DN	DOWN
E	EXISTING
EWC	ELECTRIC WATER COOLER
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
HB	HOSE BIBB
I.E.	INVERT ELEVATION (FOR REFERENCE ONLY)
L or LAV	LAVATORY
MV	MIXING VALVE
NIC	NOT IN CONTRACT
SCCR	SHORT CIRCUIT CURRENT RATING
SH	SHOWER
SK	SINK
TYP	TYPICAL
UR	URINAL
VTR	VENT THROUGH ROOF
WC	WATER CLOSET
WCO	WALL CLEANOUT
WF	WASH FOUNTAIN
UON	UNLESS OTHERWISE NOTED
YCO	YARD CLEANOUT

PLUMBING GENERAL NOTES:

- THE SYMBOLS AND THE MATERIAL LIST ARE FOR THE CONVENIENCE OF THE CONTRACTOR. CONTRACTOR SHALL VERIFY QUANTITIES AND FURNISH ALL MATERIALS REQUIRED FOR FULLY OPERATIONAL SYSTEMS, WHETHER SPECIFIED OR NOT.
- CATALOG NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR A COMPLETE DESCRIPTION OF MATERIAL ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL TAKES PRECEDENCE OVER THE CATALOG NUMBER. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN.
- CONTRACTOR SHALL VERIFY THAT FIXTURES SUPPLIED ARE APPROVED PER ALL APPLICABLE STATE, LOCAL AND GOVERNING AUTHORITIES.
- ALL FIXTURES SHALL CONFORM TO FEDERAL ACT S.3874
- INVERT ELEVATIONS ARE FROM EXISTING DRAWINGS AND MAY NOT BE ACCURATE. VERIFY ALL ELEVATIONS BEFORE BEGINNING WORK.
- VERIFY UNDERGROUND PIPE SIZES, INVERT ELEVATIONS, AND LOCATIONS PRIOR TO BEGINNING ANY WORK.
- REFER TO THE PLUMBING ROUGH-IN SCHEDULE FOR THE SIZES OF BRANCH PIPES TO PLUMBING FIXTURES
- EXISTING CONDITIONS ON DEMOLITION PLANS ARE PROVIDED TO INDICATE THE GENERAL SCOPE OF ITEMS TO BE REMOVED. REFER TO SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL DEMOLITION INFORMATION.
- P.C. SHALL CUT AND PATCH EXISTING AS REQUIRED FOR NEW OR DEMOLITION WORK UNLESS NOTED OTHERWISE. REFER TO SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL INFORMATION.

PLUMBING ROUGH-IN SCHEDULE					
NOTES: (APPLIES TO ALL PLUMBING FIXTURES LISTED BELOW)					
1) SIZES SHOWN ARE MINIMUMS. LARGER SIZES SHOWN ON THE DRAWING SHALL DICTATE THE ROUGH-IN SIZE. 2) SANITARY RISERS UP IN WALL TO FIXTURES SHALL BE A MINIMUM OF 2". 3) DOMESTIC WATER BRANCH PIPING OUTSIDE OF THE WALL/CHASE SHALL BE A MINIMUM OF 3/4" UNLESS NOTED OTHERWISE. ONLY THE FINAL RISE-DROP SHALL BE SMALLER. 4) FINAL SANITARY SIZE SHALL MATCH P-TRAP SIZE (REFER TO MATERIAL LIST).					
TAG NAME	DESCRIPTION	COLD WATER	HOT WATER	SANITARY	VENT
EWC-1	ELECTRIC WATER COOLER (ACCESSIBLE)	1/2"	-	1 1/2"	1 1/2"
FD-1	FLOOR DRAIN	-	-	2"	1 1/2"
FD-2	FLOOR DRAIN	-	-	2"	1 1/2"
L-1	LAVATORY (ACCESSIBLE)	1/2"	1/2"	1 1/2"	1 1/2"
L-2	LAVATORY (ACCESSIBLE)	1/2"	1/2"	1 1/2"	1 1/2"
SH-1	SHOWER	1/2"	1/2"	2"	1 1/2"
SH-2	SHOWER	1/2"	1/2"	2"	1 1/2"
SH-3	BATH TUB / SHOWER	1/2"	1/2"	1 1/2"	1 1/2"
UR-2	URINAL (FLOOR MOUNT)	3/4"	-	2"	1 1/2"
URFV-1	URINAL	3/4"	-	2	1 1/2"
WC-1	WATER CLOSET (ACCESSIBLE)	1/2"	-	4"	2"

The image illustrates ADA Guidelines for Accessible Design, specifically focusing on front and side access for plumbing fixtures. It shows five scenarios with a person in a wheelchair:

- INSTALL ABOVE COUNTER DEVICE AT 44" ABOVE FINISHED FLOOR:** Shows a person reaching for a device mounted at 44" height. The maximum reach is 20" for front access and 20"-25" for side access. The maximum height of the device is 48" MAX.
- INSTALL ABOVE COUNTER DEVICE AT 40" ABOVE FINISHED FLOOR:** Shows a person reaching for a device mounted at 40" height. The maximum reach is 20" for front access and 20"-25" for side access. The maximum height of the device is 44" MAX.
- INSTALL DEVICE AT 18" ABOVE FINISHED FLOOR:** Shows a person reaching for a device mounted at 18" height. The minimum clearance is 15" MIN. The maximum height of the device is 48" MAX.
- INSTALL DEVICE AT 44" ABOVE FINISHED FLOOR:** Shows a person reaching for a device mounted at 44" height. The maximum reach is 10" MAX. The maximum height of the device is 48" MAX.
- INSTALL DEVICE AT 42" ABOVE FINISHED FLOOR:** Shows a person reaching for a device mounted at 42" height. The maximum reach is 10"-24" MAX. The maximum height of the device is 46" MAX.

ADA GUIDELINES - FRONT ACCESS

ADA GUIDELINES - SIDE ACCESS

ADA STANDARDS FOR ACCESSIBLE DESIGN

MECHANICAL GENERAL NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING, VENTILATION, PIPING, AND TEMPERATURE CONTROL.

- DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT EXACT INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
- CATALOG AND MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE DESCRIPTION OF MATERIAL SCHEDULED ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL AND SCHEDULED PERFORMANCE TAKES PRECEDENCE OVER THE MODEL NUMBER. THE FIRST MANUFACTURER SCHEDULED IS THE BASIS OF DESIGN.
- DETERMINATION OF QUANTITIES OF MATERIAL AND EQUIPMENT REQUIRED SHALL BE MADE BY THE CONTRACTOR FROM THE DOCUMENTS. WHERE MATERIAL AND/OR QUANTITY DISCREPANCIES ARISE BETWEEN DRAWINGS, SCHEDULES AND/OR SPECIFICATIONS, THE HIGHER QUALITY/ GREATER NUMBER SHALL GOVERN.
- DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
- COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
- REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
- ANY CHANGES REQUIRED TO ELIMINATE CONFLICTS OR THAT RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO OTHERS.
- EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
- REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIOVISUAL, AND OTHER MECHANICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
- EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
- IN AREAS WITH DRYWALL CEILINGS COORDINATE LOCATIONS OF ACCESS PANELS WITH THE GC FOR ACCESS TO VALVES, DUCTWORK ACCESSORIES, DAMPERS, ETC. COORDINATE PANEL TYPE AND COLOR WITH ARCHITECT. NOTIFY THE GC OF THE REQUIRED ACCESS PANELS PRIOR TO BIDDING.
- SEAL ALL FLOOR, WALL, AND ROOF PENETRATIONS AIRTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE. PENETRATIONS THROUGH EXTERIOR WALLS AND ROOF SHALL BE SEALED AIRTIGHT WITH WATERPROOFING MATERIALS RECOMMENDED BY MANUFACTURER FOR OUTDOOR USE.
- CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALL, PARTITION, FLOOR, AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN ROOMS.
- WHERE PIPES AND DUCTS ARE SHOWN TO PENETRATE FLOORS, PROVIDE SLEEVED OPENINGS WITH THE TOP EDGE RAISED ABOVE FLOOR SURFACE IN ACCORDANCE WITH ALL RELEVANT SPEC SECTIONS. SEAL SLEEVE PERIMETER TO BE WATERTIGHT.
- EQUIPMENT SIZES AND SERVICE CLEARANCE REQUIREMENTS VARY AMONG DIFFERENT MANUFACTURERS. CONSULT APPROVED SHOP DRAWINGS FOR EQUIPMENT SIZES AND REQUIRED SERVICE CLEARANCES. COORDINATE WITH LAYOUT OF EQUIPMENT PADS, PIPING, DUCTWORK, ETC.
- DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
- MAINTAIN A MINIMUM WORKING CLEARANCE OF 3'-6" IN FRONT OF ALL ELECTRICAL EQUIPMENT REQUIRING MAINTENANCE, INSPECTION, AND TESTING INCLUDING BUT NOT LIMITED TO PANELS, DISTRIBUTION PANELS, SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, EQUIPMENT DISCONNECTS AND STARTERS.
- MAINTAIN THE DEDICATED ELECTRICAL EQUIPMENT SPACE DEFINED BY THE WIDTH / DEPTH OF ELECTRICAL EQUIPMENT MEASURED FROM THE FLOOR TO A HEIGHT 6'-0" ABOVE THE EQUIPMENT OR THE STRUCTURAL CEILING, WHICHEVER IS LOWER. SYSTEMS FOREIGN TO THE ELECTRICAL DISTRIBUTION SYSTEM ARE NOT ALLOWED IN THE DEDICATED ELECTRICAL SPACE INCLUDING DUCTWORK, PIPING, ETC.
- PROVIDE CONCRETE EQUIPMENT PAD FOR ALL FLOOR MOUNTED EQUIPMENT. PAD SHALL EXTEND MINIMUM 6" BEYOND ALL SIDES OF EQUIPMENT EXCEPT WHERE PAD EXTENSION WOULD INTERFERE WITH WORKING SPACE AT EQUIPMENT CONTROL PANELS AND ELECTRICAL PANELS.
- DO NOT EXCEED 25 LBS PER HANGER AND A MINIMUM SPACING OF 2'-0" ON CENTER WHEN ATTACHING TO METAL ROOF DECKING (LIMITATION NOT REQUIRED WITH CONCRETE ON METAL DECK). THIS 25 LBS. LOAD AND 2'-0" SPACING INCLUDE ADJACENT ELECTRICAL AND ARCHITECTURAL ITEMS HANGING FROM DECK. IF THE HANGER RESTRICTIONS CANNOT BE ACHIEVED, SUPPLEMENTAL FRAMING OFF STEEL FRAMING SHALL BE ADDED. ANCHORS EMBEDDED IN CONCRETE SHALL BE CRACKED CONCRETE APPROVED IN ACCORDANCE WITH SPECIFICATIONS.

IMEG

www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG. ©2024 IMEG CONSULTANTS CORP. Illinois Design Firm Registration #184008976-0014

623 28TH AVENUE
ROCK ISLAND, IL 61201
P. 309.786.0673 F. 309.786.5967

0 1 2 3
REF. SCALE IN INCHES PROJECT #24001440.00

REMARKS		DESIGNED		BY		REV.		DATE		CHECKER		PETCHOU	
ZACMAN		ZACMAN		ZACMAN		ZACMAN		ZACMAN		ZACMAN		ZACMAN	
WHA No.		1854023		DATE		10/21/24		SHEET		No.		P0.00	
PHASE		☐ PRELIM ☐ PERMIT ☐ FINAL ☒ BID ☐ CONST		This document is the copyrighted property of Willett, Hoffmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright		WHA No.		1854023		DATE		10/21/24	
PLUMBING COVERSHEET		PLUMBING COVERSHEET		PLUMBING COVERSHEET		PLUMBING COVERSHEET		PLUMBING COVERSHEET		PLUMBING COVERSHEET		PLUMBING COVERSHEET	

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

WILLETT HOFFMANN & ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SERVING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.376.1401

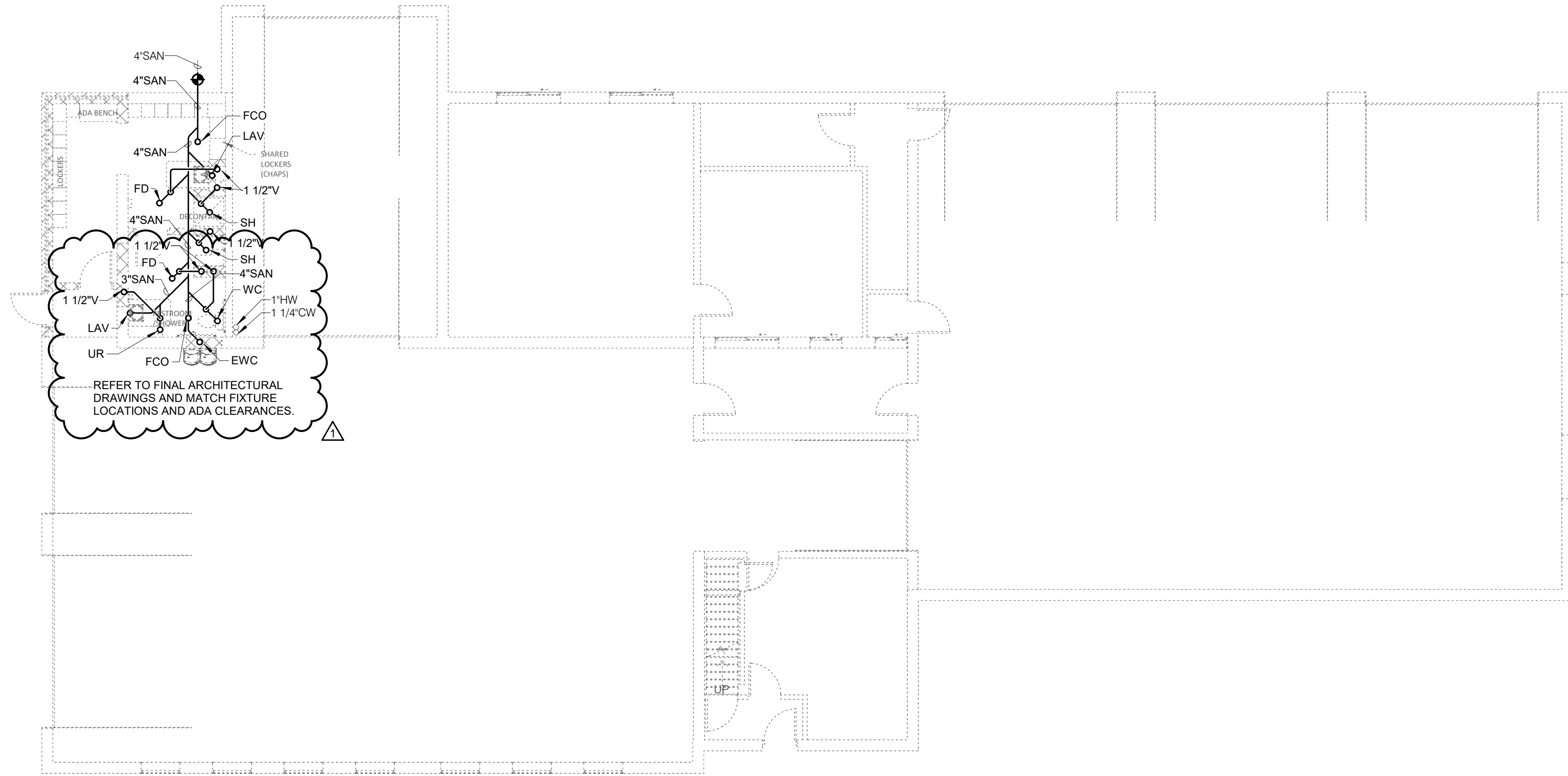
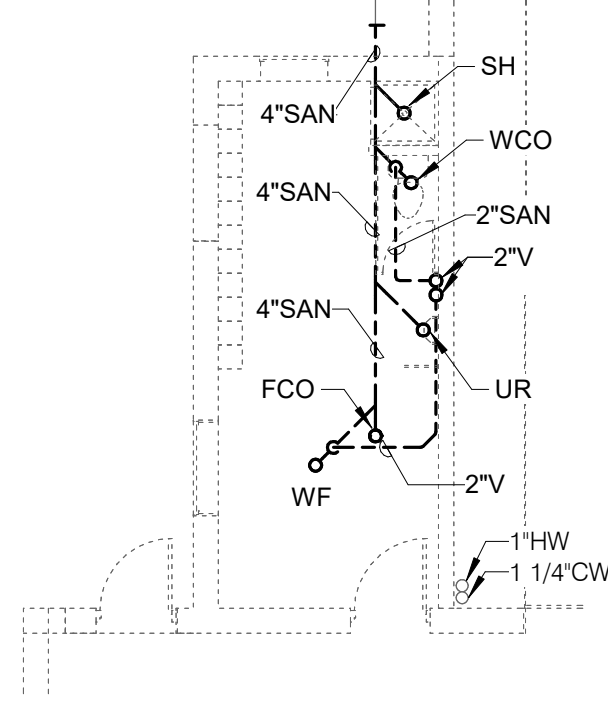
WHA No. 1854023



1

1/8" = 1'-0"

UNDERFLOOR DEMOLITION PLAN - PLUMBING - MAINTENANCE BUILDING



2

1/8" = 1'-0"

UNDERFLOOR PLAN - PLUMBING - MAINTENANCE BUILDING

IMEG
623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

REF. SCALE IN INCHES PROJECT #24001440.00

- PHASE**
- ☐ PRELIM
 - ☐ PERMIT
 - ☐ FINAL
 - ☒ BID
 - ☐ CONST

WHA No.
1854D23

DATE
10/21/24

SHEET
No.
P1.00

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

UNDERFLOOR PLANS - PLUMBING - MAINT

WILLETT HOFMANN
& ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SERVING
622 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.276.1401



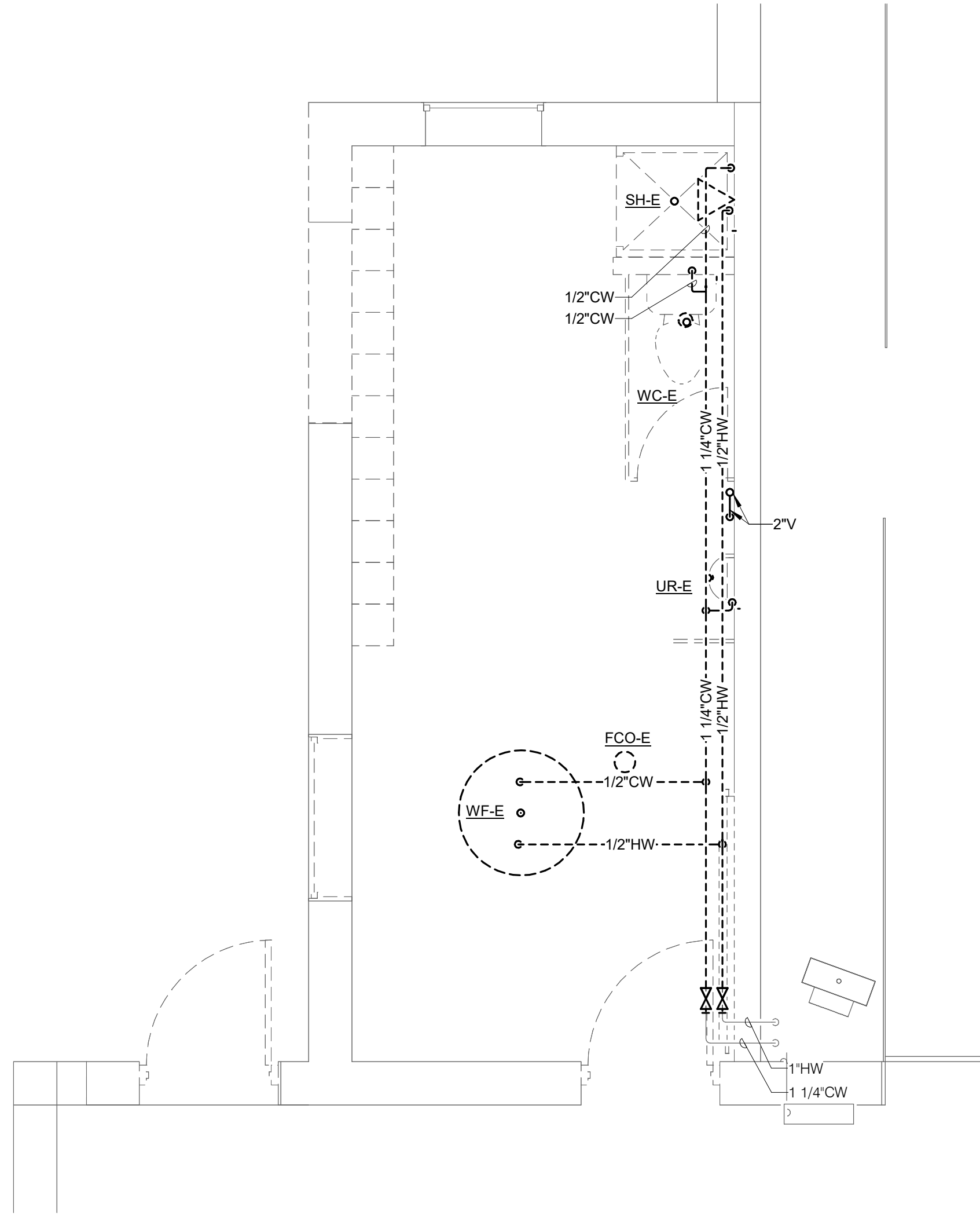
This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hofmann & Associates, Inc. WYEN



1

LEVEL 1 DEMOLITION PLAN - PLUMBING - RESTROOM / LOCKER ROOM

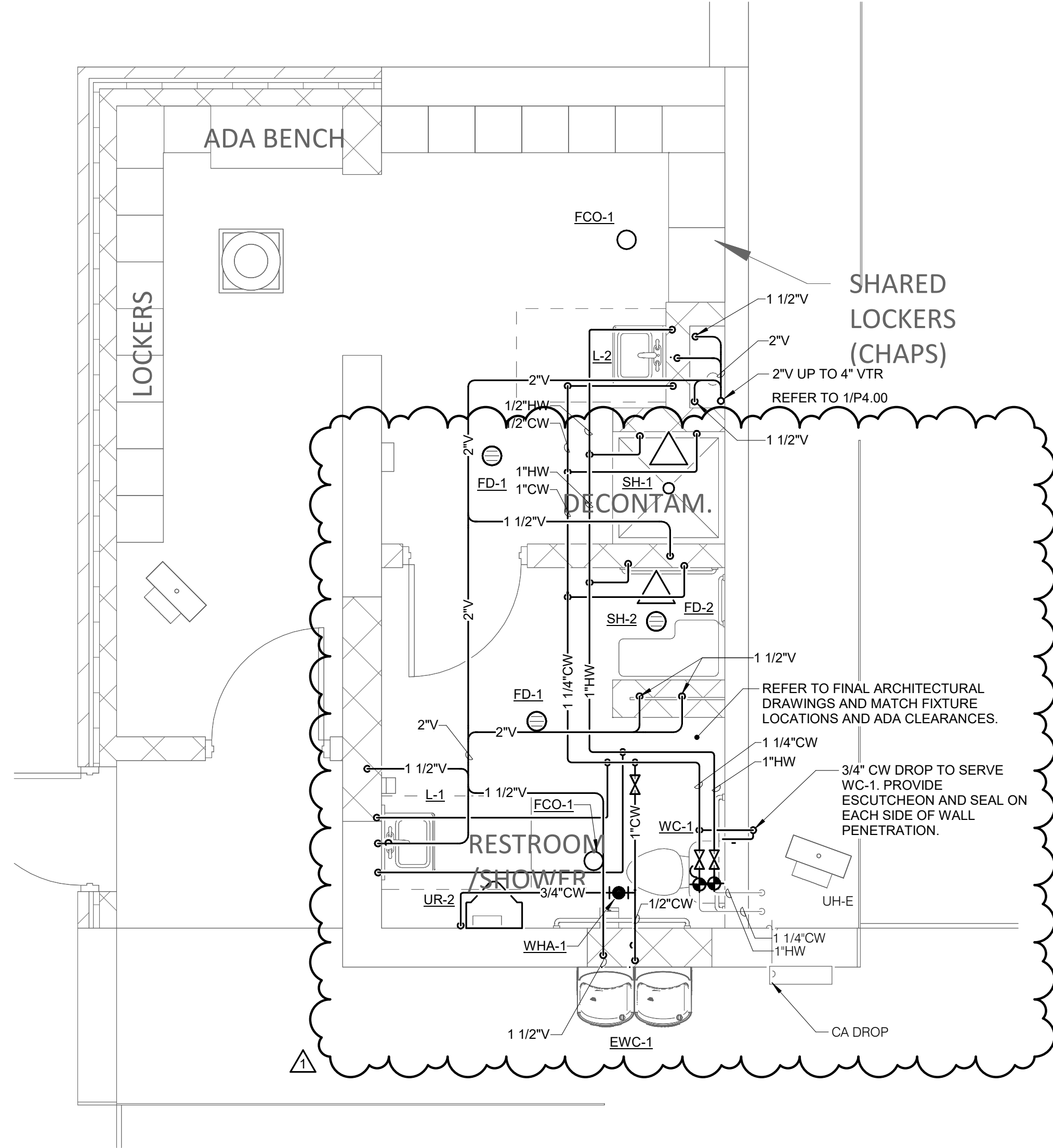
3/8" = 1'-0"



2

LEVEL 1 PLAN - PLUMBING - RESTROOM / LOCKER ROOM

3/8" = 1'-0"



SHEET NOTES

1. RUN ALL EXPOSED PIPING AS TIGHT TO CEILING AS POSSIBLE. ALL INSULATED PIPING EXPOSED IN LOCKER ROOM OR RESTROOM SHALL BE JACKETED. REFER TO SPECIFICATIONS.
2. REFER TO DETAIL 2/P4.00 FOR CLEANOUT DETAIL.



623 28TH AVENUE
ROCK ISLAND, IL 61201
P: 309.786.0673 F: 309.786.5967
www.imegcorp.com
IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

0 1 2 3
REF. SCALE IN INCHES PROJECT #24001440.00

PHASE

- ☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

DATE
10/21/24

SHEET
No.
P3.00

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264
PLUMBING ENLARGED PLANS

WILLETT HOFMANN
& ASSOCIATES
ENGINEERING ARCHITECTURE LAND SERVING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1.319.376.1401

DESIGNED
ZACMAN

CHECKER
PETCOU

REV. **DATE** **BY**

REMARKS

This document is the copyrighted property of Willett, Hofmann & Associates, Inc., and may not be copied or used by any person without written permission. © Copyright Willett, Hofmann & Associates, Inc.

PLUMBING MATERIAL LIST

TAG NAME	DESCRIPTION	MANUFACTURER AND MODEL
FCO-1	FLOOR CLEANOUT - ADJUSTABLE, CAST IRON HOUSING, ANCHOR FLANGE, TAPERED THREAD PLUG, SECURED NICKEL BRONZE TOP. TOP STYLE SHALL MATCH FLOOR FINISH AS FOLLOWS: UNFINISHED FLOOR - ROUND SOLID SCORIATED TOP TILE OR TERRAZZO - ROUND RECESSED TOP	ZURN (Z1400), JOSAM (55000), MIFAB (C1100), SMITH (4000), WADE (6000), WATTS (CO-200)
FD-1	FLOOR DRAIN - CAST IRON BODY, NICKEL BRONZE ADJUSTABLE TOP, 6" ROUND, 2" BOTTOM OUTLET, FLASHING COLLAR. TRAP SEAL - 2" PLASTIC HOUSING WITH FLEXIBLE DIAPHRAGM, SEALING GASKETS, RECLOSES AND SEALS WHEN DISCHARGE IS COMPLETED, ASSE 1072.	FLOOR DRAIN - ZURN (Z-415), SMITH (2005), WADE (1100), JOSAM (30000), WATTS (FD-100), MIFAB (F1100), SUN (FD1000) TRAP SEAL - SURE SEAL (SS), PROVENT (TRAP GUARD), SMITH (QUAD CLOSE), GREEN DRAIN, MIFAB (MIGARD), ZURN (Z1072)
FD-2	FLOOR DRAIN - CAST IRON BODY, NICKEL BRONZE ADJUSTABLE TOP, 6" ROUND, 2" BOTTOM OUTLET, FLASHING COLLAR.	FLOOR DRAIN - ZURN (Z-415), SMITH (2005), WADE (1100), JOSAM (30000), WATTS (FD-100), MIFAB (F1100), SUN (FD1000)
L-1	LAVATORY - ACCESSIBLE, WALL MOUNTED, WHITE VITREOUS CHINA, 20"x18", 4" HIGH CONTOURED BACKSPASH, FAUCET HOLES ON 4" CENTERS, DRILLED FOR CONCEALED ARM CARRIER. LAVATORY TRIM - LAVATORY TRIM - SENSOR ACTIVATED NON-MIXING FAUCET, BATTERY POWERED, BRASS CONSTRUCTION, CHROME-PLATED FINISH, SPOUT WITH AERATOR, 4" CENTERSET INSTALLATION, PERFORATED GRID STRAINER WITH 1-1/4" 17 GAUGE TAILPIECE, SOLID BRASS SOLENOID WITH BUILT-IN FILTER, WATERPROOF CONNECTORS AND CABLE. MOUNT CONTROLS AND BATTERIES IN WATERPROOF VANDAL-RESISTANT ENCLOSURE BELOW LAVATORY. MAXIMUM FLOW TO BE 0.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AND ESCUTCHEON PLATE AS REQUIRED. MIXING VALVE - POINT-OF-USE ANTI-SCALD THERMOSTATIC MIXING VALVE FOR TEMPERED WATER CONTROL, ALL BRONZE/BRASS CONSTRUCTION, ROUGH FINISH, THREADED INLETS, TAMPER RESISTANT SETPOINT, 3/8" COMPRESSION INLETS AND OUTLETS, COLD WATER BYPASS IF USED WITH MIXING FAUCET. 0.5 GPM OUTPUT. UNIT TO MIX 140 DEGREE F HOT WATER SUPPLY AND 40 DEGREE F COLD WATER SUPPLY FOR 110 DEGREE F OUTLET. UNIT SHALL BE ASSE 1070 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874. INSULATION KIT - PRE-MANUFACTURED FOR P-TRAP, STOP VALVES AND SUPPLY LINES. ACCESSORIES - QUARTER-TURN 3/8" CHROME PLATED HEAVY BRASS ANGLE SUPPLY STOPS, CHROME PLATED SOFT COPPER OR FLEXIBLE STAINLESS STEEL SUPPLY LINES, DRAIN AND OFFSET TAILPIECE, 1-1/4" 17 GAUGE CAST BRASS P-TRAP, SUPPORT CARRIER. MOUNT LAVATORY WITH SUPPORT CARRIER BOLTED SECURELY TO FLOOR. TOP OF RIM SHALL BE AT 34" ABOVE FLOOR IN COMPLIANCE WITH LATEST ADA STANDARD. [PROVIDE 29" MINIMUM CLEARANCE FROM FLOOR TO BOTTOM OF APRON IN COMPLIANCE WITH LATEST ANSI A117.1 AND ADA STANDARDS. ARMAFLEX WITH TAPE IS NOT ACCEPTABLE IN LIEU OF INSULATION KIT.	LAVATORY - AMERICAN STANDARD (0355.012), KOHLER (K-2005), SLOAN (SS-3003), TOTO (LT307), ZURN (Z5364) LAVATORY TRIM - SLOAN (SF-2350 [SF-2300]), ZURN (Z6915-XL), CHICAGO FAUCETS (EVR SERIES), HYDROTEK (HB-1000C-LR [H-1000C-LR]), MOEN (M-POWER CA8301) MIXING VALVE - LEONARD (170-LF), ACORN CONTROLS (S17069), APOLLO (34BLF), BRADLEY (SS9 SERIES), LAWLER (310/570), POWERS (SERIES LFLM495), SYMMONS (8210CK MAXLINE SERIES), WATTS (LFMMV), WILKINS (ZW1070XL) INSULATION KIT - TRUEBRO (LAV-GUARD), BROCAR PRODUCTS (TRAP WRAP), MCGUIRE (PROWRAP), PLUMBEREX (PRO-EXTREME)
L-2	LAVATORY - ACCESSIBLE, WALL MOUNTED, WHITE VITREOUS CHINA, 20"x18", 4" HIGH CONTOURED BACKSPASH, FAUCET HOLES ON 4" CENTERS, DRILLED FOR CONCEALED ARM CARRIER. LAVATORY TRIM - LAVATORY TRIM - SINGLE HANDLE MIXING FAUCET, BRASS CONSTRUCTION, CHROME-PLATED FINISH, CONVENTIONAL SPOUT WITH LAMINAR FLOW OUTLET, WASHERLESS PUSH-PULL LEVER HANDLE WITH SUPPLIES AT 4" CENTERS, CERAMIC DISC CARTRIDGE, PERFORATED GRID STRAINER WITH 1-1/4" 17 GAUGE TAILPIECE. MAXIMUM FLOW TO BE 0.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AS REQUIRED. MIXING VALVE - POINT-OF-USE ANTI-SCALD THERMOSTATIC MIXING VALVE FOR TEMPERED WATER CONTROL, ALL BRONZE/BRASS CONSTRUCTION, ROUGH FINISH, THREADED INLETS, TAMPER RESISTANT SETPOINT, 3/8" COMPRESSION INLETS AND OUTLETS, COLD WATER BYPASS IF USED WITH MIXING FAUCET. 0.5 GPM OUTPUT. UNIT TO MIX 140 DEGREE F HOT WATER SUPPLY AND 40 DEGREE F COLD WATER SUPPLY FOR 110 DEGREE F OUTLET. UNIT SHALL BE ASSE 1070 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874. INSULATION KIT - PRE-MANUFACTURED FOR P-TRAP, STOP VALVES AND SUPPLY LINES. ACCESSORIES - QUARTER-TURN 3/8" CHROME PLATED HEAVY BRASS ANGLE SUPPLY STOPS, CHROME PLATED SOFT COPPER OR FLEXIBLE STAINLESS STEEL SUPPLY LINES, DRAIN AND OFFSET TAILPIECE, 1-1/4" 17 GAUGE CAST BRASS P-TRAP, SUPPORT CARRIER. MOUNT LAVATORY WITH SUPPORT CARRIER BOLTED SECURELY TO FLOOR. TOP OF RIM SHALL BE AT 34" ABOVE FLOOR IN COMPLIANCE WITH LATEST ADA STANDARD. PROVIDE 29" MINIMUM CLEARANCE FROM FLOOR TO BOTTOM OF APRON IN COMPLIANCE WITH LATEST ANSI A117.1 AND ADA STANDARDS. ARMAFLEX WITH TAPE IS NOT ACCEPTABLE IN LIEU OF INSULATION KIT.	LAVATORY - AMERICAN STANDARD (0355.012), KOHLER (K-2005), SLOAN (SS-3003), TOTO (LT307), ZURN (Z5364) LAVATORY TRIM - DELTA (Z2C131), AMERICAN STANDARD (7385), CHICAGO FAUCET (420), KOHLER (K-15597), MOEN (8413), SPEAKMAN (S-3561), SYMMONS (S-20), T&S BRASS (B-2711-VF05), ZURN (Z7440-XL) MIXING VALVE - WATTS (LFUSG-B), LEONARD (170D-LF), LAWLER (TMM-1070T), ACORN CONTROLS (ST70), APOLLO (34DLF), POWERS (LFE480), SLOAN (MIX-135-A), SYMMONS (8210CK), WILKINS (ZW3870XL) INSULATION KIT - TRUEBRO (LAV-GUARD), BROCAR PRODUCTS (TRAP WRAP), MCGUIRE (PROWRAP), PLUMBEREX (PRO-EXTREME)

PLUMBING MATERIAL LIST

TAG NAME	DESCRIPTION	MANUFACTURER AND MODEL
SH-1	SHOWER BASE - ONE PIECE, FIBERGLASS CONSTRUCTION, WHITE GELCOATED FINISH, 36"x36" (NOMINAL), 2" DRAIN, STAINLESS STEEL REMOVABLE STRAINER. SHOWER WALLS - BY G.C. SHOWER CURTAIN - 78" TALL X 48" LONG COMMERCIAL GRADE VINYL SHOWER CURTAIN. CURTAIN SHALL BE ANTIMICROBIAL AND BE FURNISHED WITH ALUMINUM GROMMETS, PROVIDE AND INSTALL WITH 1" DIAMETER CHROME-PLATED SHOWER ROD AND STAINLESS STEEL CURTAIN HOOKS WITH SNAP FASTENERS, QTY OF HOOKS PER SHOWER CURTAIN REQUIREMENTS. MOUNT SHOWER ROD AT APPROXIMATELY 80" AFF. PROVIDE BLOCKING AND/OR MOUNTING HARDWARE AS NEEDED AT SHOWER ROD CONNECTIONS. SHOWER VALVE - SINGLE HANDLE PRESSURE BALANCED MIXING FAUCET, BRASS OR BRONZE CONSTRUCTION, POLISHED CHROME CAST METAL LEVER HANDLE, WASHERLESS DESIGN, OFF-COLD-HOT TEMPERATURE RANGE INDICATOR DIAL, INTEGRAL CHECK STOPS, ADJUSTABLE TEMPERATURE LIMIT STOP, ASSE 1016 LISTED. ACCESSORIES - CHROME-PLATED BRASS SHOWERHEAD WITH SWIVEL BALL JOINT, ADJUSTABLE SPRAY, CHROME-PLATED BRASS ARM AND FLANGE. INSTALL BOTTOM OF SHOWERHEAD AT 78" ABOVE FINISHED FLOOR. MAXIMUM FLOW TO BE 2.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. SET SAFETY LIMIT STOP TO 110 DEGREE F DISCHARGE.	SHOWER BASE - OASIS (SB-3636), AQUARIUS (SB-3636), AQUATIC (ICON SB3636), ACORN (CSBS-36-3F), MAAX (Icon 3636), SWAN (R-3636) SHOWER CURTAIN - BRADLEY (9537), ASI, OR EQUAL. SHOWER CURTAIN ROD AND CURTAIN HOOKS - FURNISHED BY SAME MFR AS SHOWER CURTAIN. SHOWER VALVE - MOEN COMMERCIAL (8375), SYMMONS (1-100), AMERICAN STANDARD (T675.501), DELTA (R10000-UNWS/T13H122), LEONARD (PAM-II), POWERS (PB413-K1) ACCESSORIES - CHROME-PLATED BRASS SHOWERHEAD WITH SWIVEL BALL JOINT, ADJUSTABLE SPRAY, CHROME-PLATED BRASS ARM AND FLANGE.
SH-2	ACCESSIBLE SHOWER WALLS, SEAT, AND GRAB BAR INSTALLED BY G.C. SHOWER CURTAIN - 78" TALL X 48" LONG COMMERCIAL GRADE VINYL SHOWER CURTAIN. CURTAIN SHALL BE ANTIMICROBIAL AND BE FURNISHED WITH ALUMINUM GROMMETS, PROVIDE AND INSTALL WITH 1" DIAMETER CHROME-PLATED SHOWER ROD AND STAINLESS STEEL CURTAIN HOOKS WITH SNAP FASTENERS, QTY OF HOOKS PER SHOWER CURTAIN REQUIREMENTS. MOUNT SHOWER ROD AT APPROXIMATELY 80" AFF. PROVIDE BLOCKING AND/OR MOUNTING HARDWARE AS NEEDED AT SHOWER ROD CONNECTIONS. SHOWER VALVE - ACCESSIBLE, SINGLE HANDLE PRESSURE BALANCED MIXING FAUCET, BRASS OR BRONZE CONSTRUCTION, WASHERLESS DESIGN, OFF-COLD-HOT TEMPERATURE RANGE INDICATOR DIAL, POLISHED CHROME CAST METAL LEVER HANDLE, INTEGRAL CHECK STOPS, ADJUSTABLE TEMPERATURE LIMIT STOP. ASSE 1016 LISTED. ACCESSORIES - CHROME-PLATED BRASS SHOWERHEAD WITH SWIVEL BALL JOINT, CHROME-PLATED BRASS ARM AND FLANGE, HAND HELD SHOWER WITH ON/OFF CONTROL AND NON-POSITIVE SHUT OFF, 69" CHROME-PLATED METAL HOSE AND QUICK DISCONNECT, CHROME-PLATED BRASS SWIVEL CONNECTOR, 30" CHROME-PLATED MOUNTING RAIL, CHROME-PLATED BRASS SUPPLY ELBOW FLANGE, CHROME-PLATED IN-LINE VACUUM BREAKER WITH CHROME-PLATED PIPING AND FLANGES, CHROME-PLATED BRASS 2 FUNCTION TRANSFER VALVE. INSTALL ALL CONTROLS BETWEEN 38" AND 48" ABOVE FINISHED FLOOR IN COMPLIANCE WITH LATEST ADA STANDARDS. INSTALL BOTTOM OF SHOWERHEAD AT 78" ABOVE FINISHED FLOOR. MAXIMUM FLOW TO BE 2.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. SET SAFETY LIMIT STOP TO 110 DEGREE F DISCHARGE.	SHOWER CURTAIN - BRADLEY (9537), ASI, OR EQUAL. SHOWER CURTAIN ROD AND CURTAIN HOOKS - FURNISHED BY SAME MFR AS SHOWER CURTAIN. SHOWER VALVE MOEN COMMERCIAL (8342/62236GBM25), SYMMONS (9605-PLR), AMERICAN STANDARD (TU662.223), DELTA (R10700-UNWS/T13H323-20), LEONARD (PAM-II-ST-F51-3D/62003), POWERS (PB417M202BV)
SH-3	SHOWER BASE - ONE PIECE, FIBERGLASS CONSTRUCTION, WHITE GELCOATED FINISH, 36"x36" (NOMINAL), 2" DRAIN, STAINLESS STEEL REMOVABLE STRAINER. SHOWER WALLS - TILE BY OTHERS. ACCESSORIES - ROD AND CURTAIN BY OTHERS. SHOWER VALVE - ACCESSIBLE, SINGLE HANDLE PRESSURE BALANCED MIXING FAUCET, BRASS OR BRONZE CONSTRUCTION, WASHERLESS DESIGN, OFF-COLD-HOT TEMPERATURE RANGE INDICATOR DIAL, POLISHED CHROME CAST METAL LEVER HANDLE, INTEGRAL CHECK STOPS, ADJUSTABLE TEMPERATURE LIMIT STOP. ASSE 1016 LISTED. ACCESSORIES - CHROME-PLATED BRASS SHOWERHEAD WITH SWIVEL BALL JOINT, CHROME-PLATED BRASS ARM AND FLANGE, HAND HELD SHOWER WITH ON/OFF CONTROL AND NON-POSITIVE SHUT OFF, 69" CHROME-PLATED METAL HOSE AND QUICK DISCONNECT, CHROME-PLATED BRASS SWIVEL CONNECTOR, 30" CHROME-PLATED MOUNTING RAIL, CHROME-PLATED BRASS SUPPLY ELBOW FLANGE, CHROME-PLATED IN-LINE VACUUM BREAKER WITH CHROME-PLATED PIPING AND FLANGES, CHROME-PLATED BRASS 2 FUNCTION TRANSFER VALVE. INSTALL ALL CONTROLS BETWEEN 38" AND 48" ABOVE FINISHED FLOOR IN COMPLIANCE WITH LATEST ADA STANDARDS. INSTALL BOTTOM OF SHOWERHEAD AT 78" ABOVE FINISHED FLOOR. MAXIMUM FLOW TO BE 2.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. SET SAFETY LIMIT STOP TO 110 DEGREE F DISCHARGE.	SHOWER BASE - OASIS (SB-3636), AQUARIUS (SB-3636), AQUATIC (ICON SB3636), ACORN (CSBS-36-3F), MAAX (Icon 3636), SWAN (R-3636) SHOWER VALVE - MOEN COMMERCIAL (8342/62236GBM25), SYMMONS (9605-PLR), AMERICAN STANDARD (TU662.223), DELTA (R10700-UNWS/T13H323-20), LEONARD (PAM-II-ST-F51-3D/62003), POWERS (PB417M202BV)
UR-2	URINAL - FLOOR MOUNTED, WHITE VITREOUS CHINA, FLUSH VALVE TYPE, WASHOUT ACTION, LOW CONSUMPTION, 3/4" TOP SPUD, 2" OUTLET, SET AND INSTALL FIXTURE AS REQUIRED PER MFR'S INSTRUCTIONS. FLUSH VALVE - EXPOSED, SENSOR OPERATION, BATTERY POWERED, 0.5 GALLONS PER FLUSH, 11-1/2" ROUGH-IN, CHROME-PLATED, 3/4" I.P.S. SCREWDRIVER STOP-CHECK VALVE WITH VANDAL RESISTANT CAP, HIGH BACK PRESSURE VACUUM BREAKER, NON-HOLD-OPEN HANDLE, ADJUSTABLE TAILPIECE, SPUD COUPLING AND FLANGE, WALL FLANGE WITH SET SCREW, MANUAL OVER-RIDE, LOW BATTERY INDICATOR LIGHT, RANGE ADJUSTMENT SCREW, CHLORAMINE RESISTANT MATERIALS, 3-YEAR WARRANTY.	URINAL - AMERICAN STANDARD (6400.014), KOHLER (K-4920-T), ZURN (Z5790) ZURN (ZER6003AV), SLOAN (186SFSM), AMERICAN STANDARD (6083051.002), HYDROTEK (HB8-B1-05), MOEN (8315), KOHLER (K-10958-SV-CP), TOTO (TEU1LA12#CP), AMTC (AEF-801-CU-05)
UREF-1	FLUSH VALVE - EXPOSED, SENSOR OPERATION, BATTERY POWERED, 0.5 GALLONS PER FLUSH, 11-1/2" ROUGH-IN, CHROME-PLATED, 3/4" I.P.S. SCREWDRIVER STOP-CHECK VALVE WITH VANDAL RESISTANT CAP, HIGH BACK PRESSURE VACUUM BREAKER, NON-HOLD-OPEN HANDLE, ADJUSTABLE TAILPIECE, SPUD COUPLING AND FLANGE, WALL FLANGE WITH SET SCREW, MANUAL OVER-RIDE, LOW BATTERY INDICATOR LIGHT, RANGE ADJUSTMENT SCREW, CHLORAMINE RESISTANT MATERIALS, 3-YEAR WARRANTY.	ZURN (ZER6003AV), SLOAN (186SFSM), AMERICAN STANDARD (6083051.002), HYDROTEK (HB8-B1-05), MOEN (8315), KOHLER (K-10958-SV-CP), TOTO (TEU1LA12#CP), AMTC (AEF-801-CU-05)
WC-1	WATER CLOSET - ACCESSIBLE, FLOOR MOUNTED, TANK TYPE, WHITE VITREOUS CHINA, CLOSE COUPLED, SIPHON JET, ELONGATED BOWL, BOLT CAPS, 12" ROUGH-IN, FLOAT VALVE WITH VACUUM BREAKER, CHROME-PLATED TRIP LEVER, 1.6 GALLONS PER FLUSH (MAXIMUM). SEAT - WHITE, EXTRA HEAVY, OPEN FRONT, INJECTION MOLDED SOLID ANTI-MICROBIAL PLASTIC, SELF-SUSTAINING HINGE, STAINLESS STEEL OR PLATED STEEL POSTS AND NUTS. ACCESSORIES - QUARTER-TURN 3/8" CHROME-PLATED HEAVY BRASS ANGLE SUPPLY WITH STOP, CHROME-PLATED SOFT COPPER SUPPLY LINE. TOP OF SEAT SHALL BE AT 17"-19" ABOVE FINISHED FLOOR. FLUSH HANDLE SHALL BE LOCATED ON THE WIDE SIDE OF THE TOILET STALL AND OPERATE WITH NO GREATER THAN 5 LB FORCE IN COMPLIANCE WITH LATEST ADA STANDARDS. VERIFY EQUIPMENT REQUIREMENTS AND ROUGH-IN LOCATIONS.	WATER CLOSET - ZURN (Z5555-K), GRANITE (3814), KOHLER (K-3979), ELJER (091-2175), GERBER (21-718), TOTO (CST744SL), NIAGARA PRO (C11.300.01 or C11.301.01) SEAT - BEMIS (3155SSCT), CHURCH (3155C), BENEKE (533PC), OLSONITE (95), SAME AS WATER CLOSET MANUFACTURER
WHA-1	WATER HAMMER ARRESTOR - BELLOWS TYPE, PRE-CHARGED, ALL LEAD FREE STAINLESS STEEL CONSTRUCTION, ASSE 1010 APPROVED, PDI CERTIFIED, RATED FOR 12-32 FIXTURE UNITS. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.	ZURN (Z1700), JR SMITH (5005-5050), WADE (W5-100), JOSAM (75000 SERIES), WATTS (SS), MIFAB (WHB)

PLUMBING (WITH POWER) MATERIAL LIST

TAG NAME	DESCRIPTION	ELECTRICAL					MANUFACTURER AND MODEL
		HP (NOTE E)	VOLTAGE	PHASES	BY (NOTE A)	TYPE (NOTE B)	
EW-C1	ELECTRIC WATER COOLER - WALL HUNG, BI-LEVEL UNITS, ADA COMPLIANT WITH MATCHING STAINLESS STEEL APRON INSTALLED UNDER UPPER UNIT 18 GAUGE STAINLESS STEEL CABINETS AND NON-SPLASH BASINS WITH STAINLESS STEEL FINISH, STREAM PROJECTORS WITH PROTECTIVE HOODS, PUSH BAR OR LEVER OPERATING CONTROLS ON FRONT AND BOTH SIDES, BUILT-IN FLOW REGULATOR, PLASTIC P-TRAP ASSEMBLY, ADJUSTABLE THERMOSTAT, MOUNTING ACCESSORIES, TANK DRAIN AND ANGLE STOPS, HERMETIC COMPRESSOR TO OPERATE ON HFC-134a REFRIGERANT, COMPLIANT TO LATEST ANSI A117.1 AND ADA STANDARDS. UNIT SHALL COMPLY WITH FEDERAL ACT S.3874. BOTTLE FILLING STATION - UNIT MOUNTED, STAINLESS STEEL CONSTRUCTION AND FINISH, INTEGRAL DRAIN, SENSOR OPERATED WITH AUTOMATIC SHUTOFF, REPLACEABLE LEAD-CHLORINE-TASTE-ODOR WATER FILTER, BOTTLE COUNTER, FILTER REPLACEMENT INDICATOR. UNIT SHALL PROVIDE 8.0 GPH OF WATER FROM 80°F TO 50°F AT 90°F AMBIENT. WATER SYSTEM SHALL BE OF LEAD FREE CONSTRUCTION. TANK SHALL BE TESTED TO 125 PSIG. ORIFICE SHALL BE AT 36" (MAXIMUM) ABOVE FINISHED FLOOR ON LOWER UNIT AND 40" ABOVE FINISHED FLOOR ON UPPER UNIT. BOTTOM OF APRON SHALL BE 27" ABOVE FLOOR ON LOWER UNIT IN COMPLIANCE WITH LATEST ADA STANDARDS. ELECTRICAL REQUIREMENTS - CORD AND PLUG, PLAIN RECEPTACLE MOUNTED WITHIN EWC LOWER ENCLOSURE, GFCI BREAKER.	0.25	120	1	EC	PLUG	ELECTRIC WATER COOLER-ELKAY (LZST), OASIS (PG8EBFSL), MURDOCK (A172408F-UG-BF12)

PIPE INSULATION SCHEDULE (PLUMBING)

- GENERAL NOTES:
1. REFER TO THE SPECIFICATIONS FOR TYPE DESCRIPTIONS AND JACKETING REQUIREMENTS. VALUES LISTED BELOW ARE BASED ON ASHRAE / IECC REQUIREMENTS.
2. TYPE A INSULATION IS NOT ALLOWED IN NON-AIR CONDITIONED SPACES, SUCH AS MECHANICAL ROOMS, EXTERIOR, ATTICS, ETC.
3. TYPE B INSULATION GREATER THAN 1" THICK SHALL BE INSTALLED USING MULTIPLE LAYERS OF 3/4" OR 1" WITH STAGGERED SEAMS.
4. PROVIDE RIGID INSERT AT HANGERS, EITHER PRE-MANUFACTURED COUPLINGS (REFER TO PIPE HANGER AND SUPPORTS SPECIFICATIONS) OR TYPE C OR E INSULATION. SEE SPEC. FOR MORE DETAILS.
5. DIRECT BUIRED PIPING SHALL ONLY USE TYPE C OR TYPE E. REDUCTION IN THICKNESS FOR DIRECT BURED PIPING IS ALLOWED PER ASHRAE / IECC AS APPLICABLE.

PIPE SYSTEM	INSULATION TYPE	INSULATION THICKNESS PER NOMINAL PIPE OR TUBE SIZE						NOTES
		< 1"	1" TO < 1.5"	1.5" TO < 4"	4" TO < 8"	> 8"		
22 PLUMBING - WASTE								
D - DRAIN - PLUMBING	B (Elasto), E (Polyiso)	0.5"	0.5"	1"	1"	1"		APPLY INSULATION ONLY TO LOW TEMP DRAINS (55 DEG AND LOWER IE: COOLING COIL CONDENSATE, ICE MACHINE DRAINS, ETC.)
V - VENT	B (Elasto), E (Polyiso)	0.5"	0.5"	1"	1"	1"		APPLY INSULATION ONLY WITHIN 10' OF EXTERIOR PENETRATION
22 PLUMBING - WATER								
CW - COLD WATER - POTABLE	B (Elasto), E (Polyiso)	0.5"	0.5"	1"	1"	1"		
HW - HOT WATER - POTABLE	B (Elasto), E (Polyiso)	1"	1"	1"	1"	1"		
HWC - HOT WATER CIRCULATING - POTABLE	B (Elasto), E (Polyiso)	1"	1"	1"	1"	1"		
TW - TEMPERED WATER - POTABLE	B (Elasto), E (Polyiso)	1"	1"	1"	1"	1"		



623 28TH AVENUE
ROCK ISLAND, IL 61201
P. 309.786.0673 F. 309.786.5967

www.imegcorp.com

IMEG RESERVES PROPRIETARY RIGHTS, INCLUDING COPYRIGHTS, TO THIS DRAWING AND THE DATA SHOWN THEREON. SAID DRAWING AND/OR DATA ARE THE EXCLUSIVE PROPERTY OF IMEG AND SHALL NOT BE USED OR REPRODUCED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN APPROVAL AND PARTICIPATION OF IMEG.
©2024 IMEG CONSULTANTS CORP.
Illinois Design Firm Registration #184008976-0014

0 1 2 3
REF. SCALE IN INCHES PROJECT #24001440.00

REMARKS

DESIGNED
ZACMAN

CHECKED
PETCOU

BY

DATE

REV.



WILLET HOFMANN & ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SERVING
623 32ND AVE SW CEDAR RAPIDS, IA 52404
1-319-726-1401

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W, MILAN, IL 61264

PLUMBING SCHEDULES

Willet, Hofmann & Associates, Inc. © Copyright

PHASE

☐ PRELIM

☐ PERMIT

☐ FINAL

☒ BID

☐ CONST

WHA No.
18540223

DATE
10/21/24

SHEET
No.
P6.00



**Rock
Island
County**

ADDENDUM #2

TO: All Plan Holders of Record
FROM: Matthew M. Miller, County Engineer
DATE: November 7, 2024
RE: Section 23-00399-00-MG (Milan Maint. Garage – Locker Room Addition)

Please be advised of the attached changes regarding the above mentioned plans and proposal:

Should you have any questions regarding these changes please do not hesitate to contact this office. Thank you.

**OFFICE OF THE
COUNTY ENGINEER**

Rock Island County, Illinois

851 W 10th Avenue, P.O. Box 797, Milan, IL 61264

Phone: (309) 787-4668 * Fax: (309) 787-4680



Contains 30%
recycled post-consumer fiber

DOCUMENT 00901
ADDENDUM NO 2

DATE: November 7th, 2024

PROJECT NAME: Locker Room Addition

This addendum forms a part of the bidding and contract documents. This Addendum supersedes and supplements all portions of the original bidding and contract documents dated 10/21/2024, with which it conflicts.

ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE SPACE PROVIDED ON THE BID FORM.
FAILURE TO DO SO MAY SUBJECT THE BIDDER TO DISQUALIFICATION.

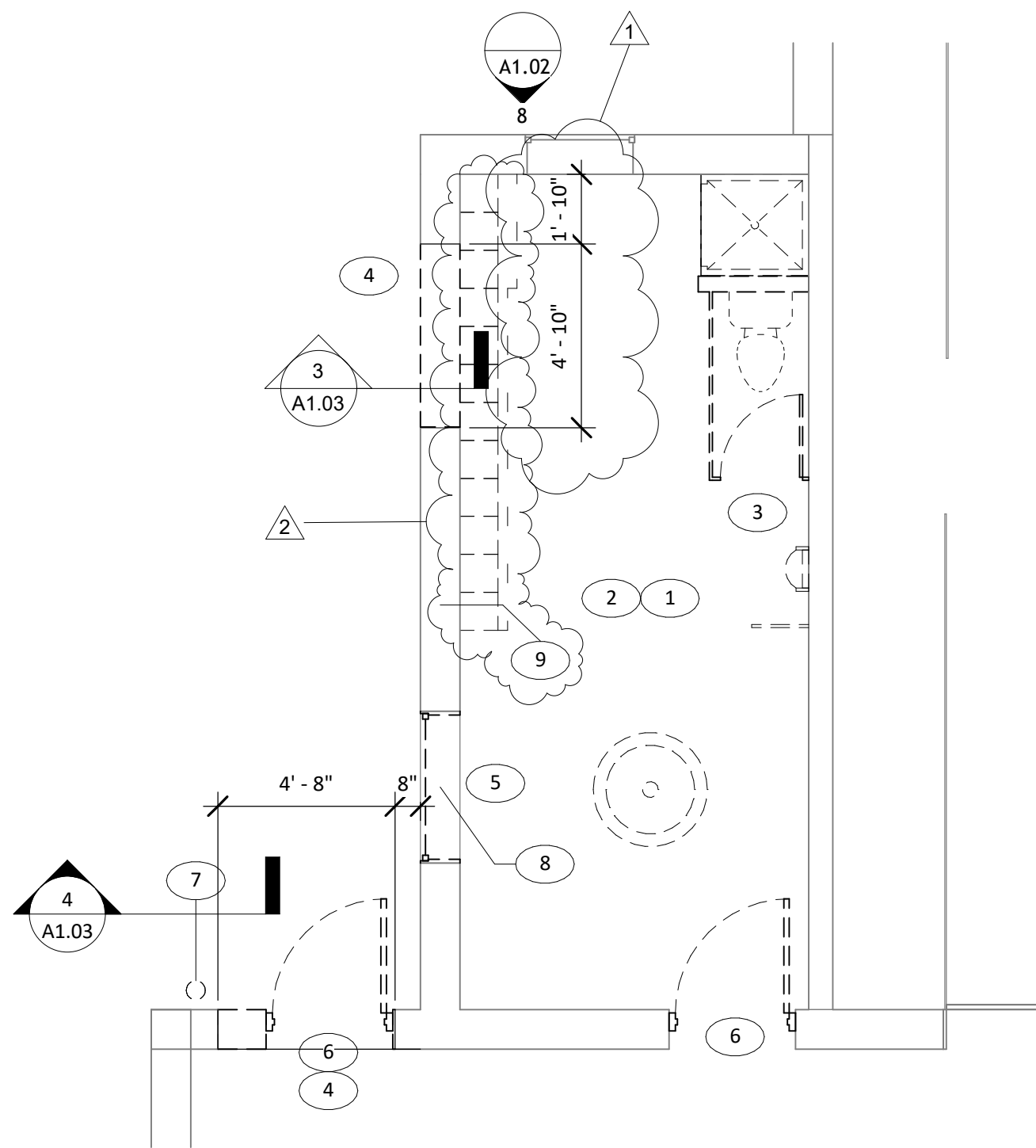
DRAWINGS – ARCHITECTURAL

1. **SHEET A1.01**
 - i. **REPLACE** sheet with revised dated 11/07/2024.
2. **SHEET A2.01**
 - i. **REPLACE** sheet with revised dated 11/07/2024.
3. **SHEET A5.01**
 - i. **REPLACE** sheet with revised dated 11/07/2024.

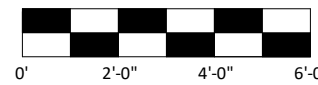
Prepared By: **Willett Hofmann & Associates**

John Gabrielson, AIA
Illinois License No. 001024643
Registration Renewal Date: November 30, 2026

End of Document 00901



1 FIRST FLOOR LOCKER ROOM DEMO PLAN
SCALE: 1/4" = 1'-0"



FINISH SPECIFICATIONS

ALL FINISHES SHALL MEET ALL CLASS A FIRE RATINGS & COMPLY WITH CHAPTER 8 OF INTERNATIONAL BUILDING CODE.

CERAMIC TILE

CT1 MFG: DAL TILE
TYPE: 12"x24" FIELD TILE,
3" BULLNOSE AT TOP OF WAINSCOT
PATTERN: STACKED BOND
COLOR: JET SETTER DUSK

SC1 SEALED CONCRETE

WALL BASE

VB1 MFG: TARKETT
TYPE: 4" ROLL STOCK VINYL WALL BASE
COLOR: 20 CHARCOAL WG

EPOXY PAINT

EPT1 MFG: SHERWIN WILLIAMS
COLOR: SNOWBOUND SW7004

EPT2 MFG: SHERWIN WILLIAMS
COLOR: SW7068 GRIZZLE GRAY
(DOORS & DOOR FRAMES ONLY)

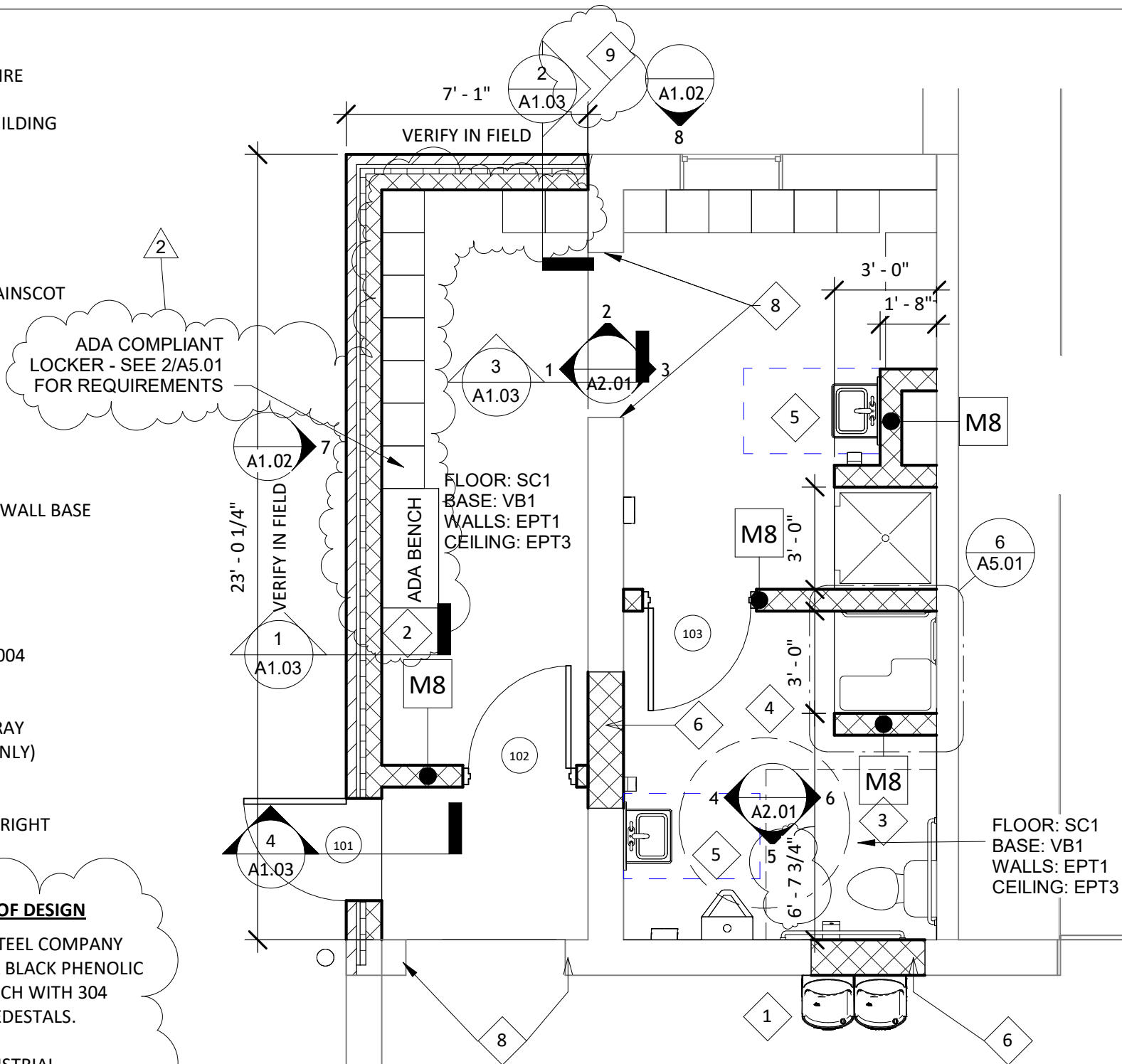
EPT3 MFG: SHERWIN WILLIAMS
COLOR: SW70007 CEILING BRIGHT WHITE (CEILING PAINT)

RESTROOM BENCH AND LOCKER BASIS OF DESIGN

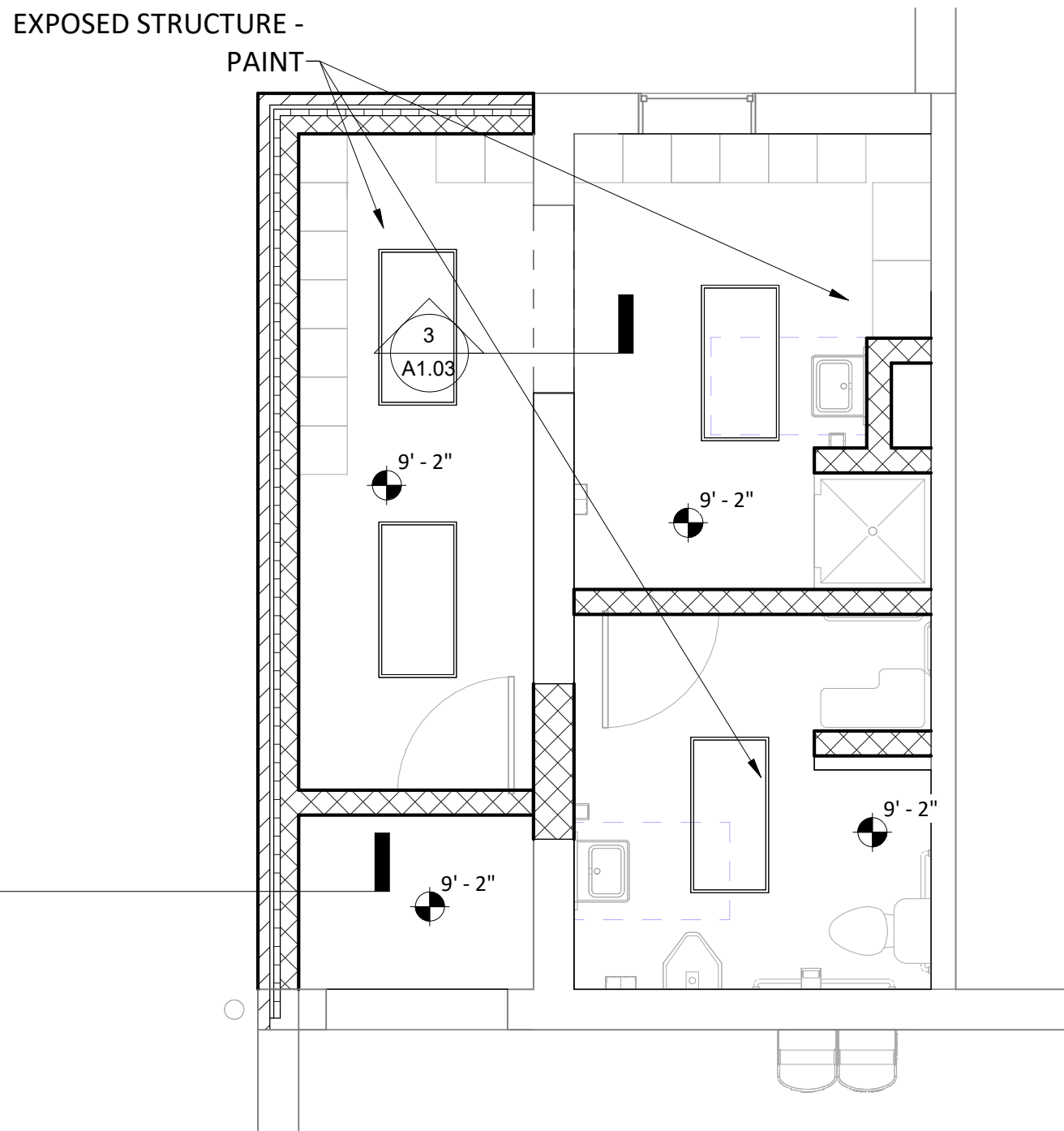
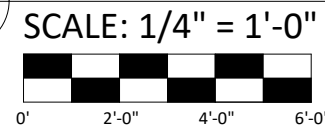
ADA BENCH MFG: ROBINSON STEEL COMPANY
TYPE: 20"x42" ADA BLACK PHENOLIC LOCKER ROOM BENCH WITH 304 STAINLESS STEEL PEDESTALS.

LOCKERS (15) MFG: GLOBAL INDUSTRIAL
TYPE: INFINITY 1-TIER 1 DOOR LOCKER, 15"x15"x78", GRAY

GEAR LOCKERS (2) MFG: ULINE
TYPE: H-8322 GRAY 24"x18"x72"



2 FIRST FLOOR ENLARGED LOCKER ROOM PLAN
SCALE: 1/4" = 1'-0"



4 FIRST FLOOR LOCKER ROOM ENLARGED CEILING PLAN
SCALE: 1/4" = 1'-0"



LOCKER ROOM DEMOLITION KEYNOTES

- 1 REMOVE ALL PLUMBING FIXTURES AND ACCESSORIES
- 2 REMOVE ALL LOCKERS, BENCHES, SHELVING, AND ANY OTHER ITEMS ATTACHED TO THE WALLS
- 3 REMOVE ALL TOILET PARTITIONS
- 4 SAWCUT AND REMOVE PORTION OF EXISTING MASONRY WALL FLUSH WITH SURROUNDING SLAB.
- 5 REMOVE WINDOW ASSEMBLY
- 6 REMOVE DOOR AND FRAME ASSEMBLY
- 7 REMOVE EXISTING DOWNSPOUT AND INTAKE. REROUTE TO WEST SIDE OF BUILDING.
- 8 REMOVE EXISTING WINDOW ASSEMBLY AND STONE SILL. PREPARE OPENING FOR MASONRY INFILL TO MATCH.
- 9 REMOVE EXISTING LOCKER CURB IN ITS ENTIRETY. GRIND AND PREP FLOOR AS REQUIRED FOR SMOOTH LEVEL FINISH.

LOCKER ROOM KEYNOTES

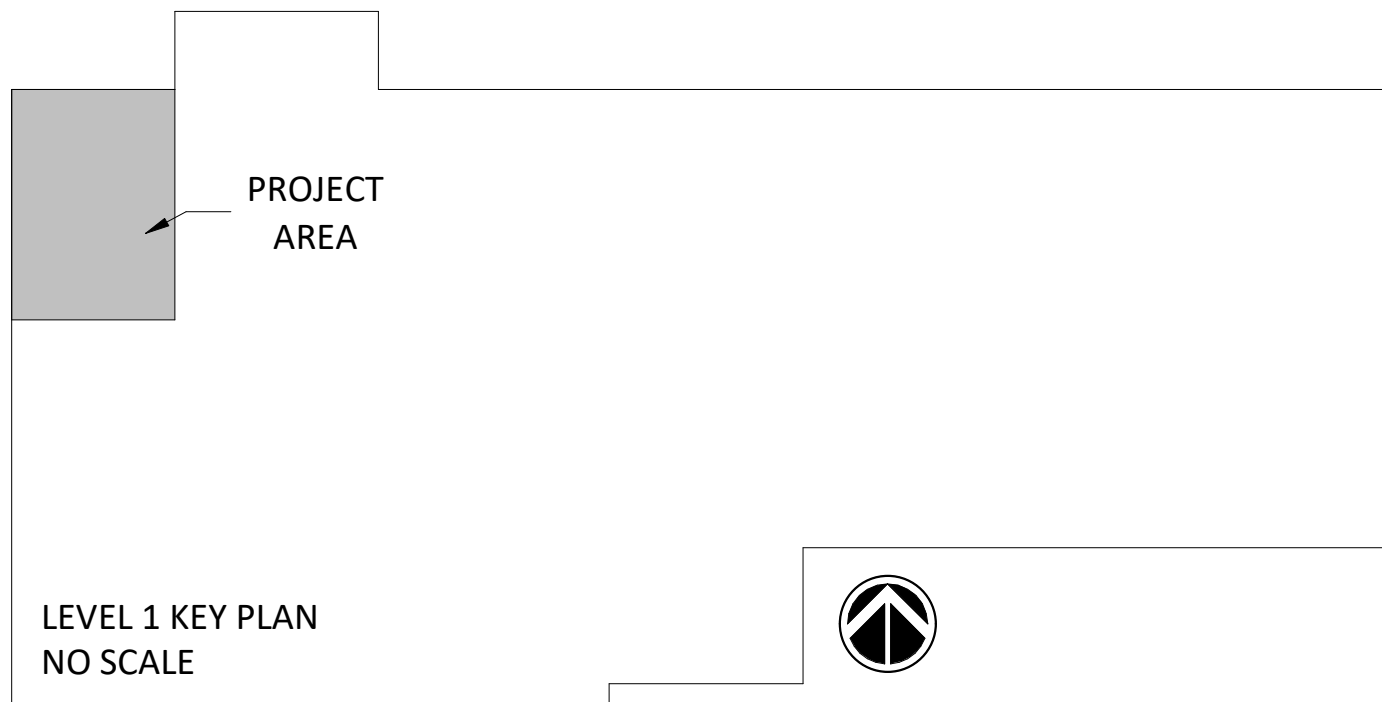
- 1 PROVIDE HI/LO WATER FOUNTAIN
- 2 PROVIDE 20"x42" ADA BENCH
- 3 INSTALL GRAB BARS PER ADA STANDARDS
- 4 INSTALL SHOWER PER ADA STANDARDS
- 5 INSTALL SINK PER ADA STANDARDS
- 6 INFILL EXISTING OPENING WITH MASONRY TO MATCH EXISTING.
- 7 GRIND AND GROUT FILL CUT EDGES OF REMOVED WALL SECTION AS REQUIRED FOR NEW FINISHES.
- 8 PROVIDE NEW STAINLESS STEEL PLATING OVER CUT EDGE OF MASONRY OPENING
- 9 PROVIDE BACKER ROD AND SEALANT CONTROL JOINT AT INTERSECTION WITH EXISTING MASONRY...

GENERAL NOTES:

1. DIMENSIONS MUST BE VERIFIED IN THE FIELD ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE PROCEEDING WITH THE AFFECTED WORK.
2. DO NOT SCALE THE DRAWINGS.
3. THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH SITE CONDITIONS AS THEY MAY AFFECT CARRYING OUT THE WORK AS DESCRIBED IN THESE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INVESTIGATE, VERIFY, AND BE RESPONSIBLE FOR ALL CONDITIONS OF THE PROJECT AND NOTIFY THE ARCHITECT OF ANY CONDITIONS THAT REQUIRE MODIFICATION BEFORE PROCEEDING WITH THE WORK.
4. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, LABOR AND SERVICES NECESSARY TO COMPLETE THE WORK.
5. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE BUILDING CODES AS ADOPTED BY THE CITY OF ROCK ISLAND.
6. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL TRADES AND THE PRECENTION OF CONFLICT AMONG ALL TRADES.
7. ARCHITECTURAL DRAWINGS MUST ALWAYS BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTS, ANY DISCREPANCY BETWEEN THESE DRAWINGS AND OTHER DOCUMENTS SHOULD BE REPORTED TO THE ARCHITECT FOR CLARIFICATION AND VERIFICATION PRIOR TO COMMENCEMENT OF AFFECTED WORK.
8. PROVIDE SEALANT AT ALL JOINTS. CRACKS THAT OCCUR WHERE DISSIMILAR MATERIALS INTERSECT PERPENDICULAR TO EACH OTHER AND THE INTERSECTION IS EXPOSED TO VIEW, UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
9. PAINT ALL EXPOSED STRUCTURE UNLESS NOTED OTHERWISE.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY BRACING AND SHORING REQUIRED DURING CONSTRUCTION.
11. ALL WORK AND MATERIAL SHALL BE REGARDED AS NEW UNLESS SPECIFICALLY INDICATED AS "EXISTING" ON THE DRAWINGS.
12. PORTABLE FIRE EXTINGUISHERS TO BE PROVIDED PER I.F.C. 906 AND/OR THE LOCAL AUTHORITY HAVING JURISDICTION. EXTINGUISHERS TO BE MAINTAINED BY THE OWNER.

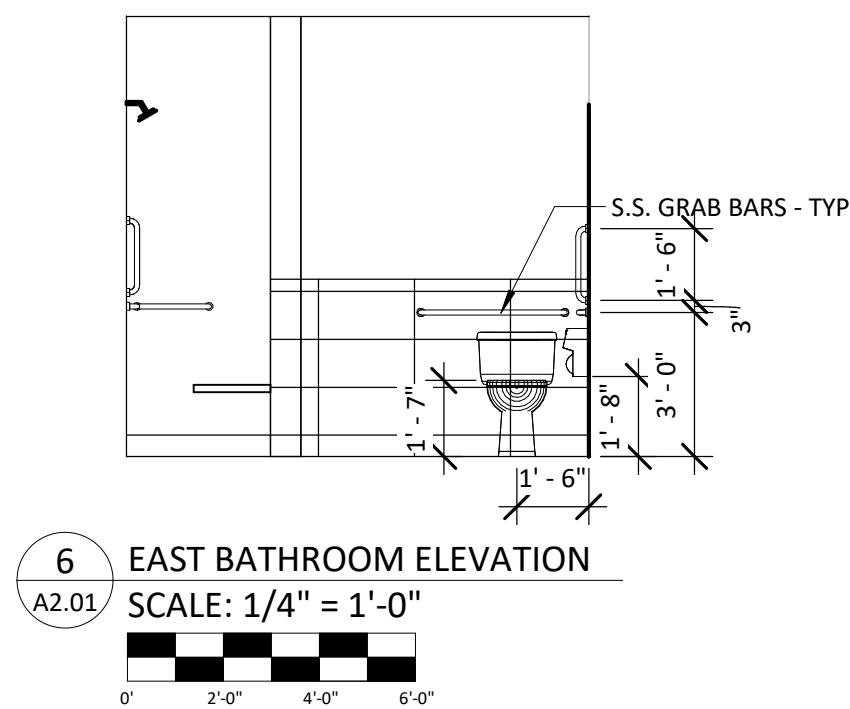
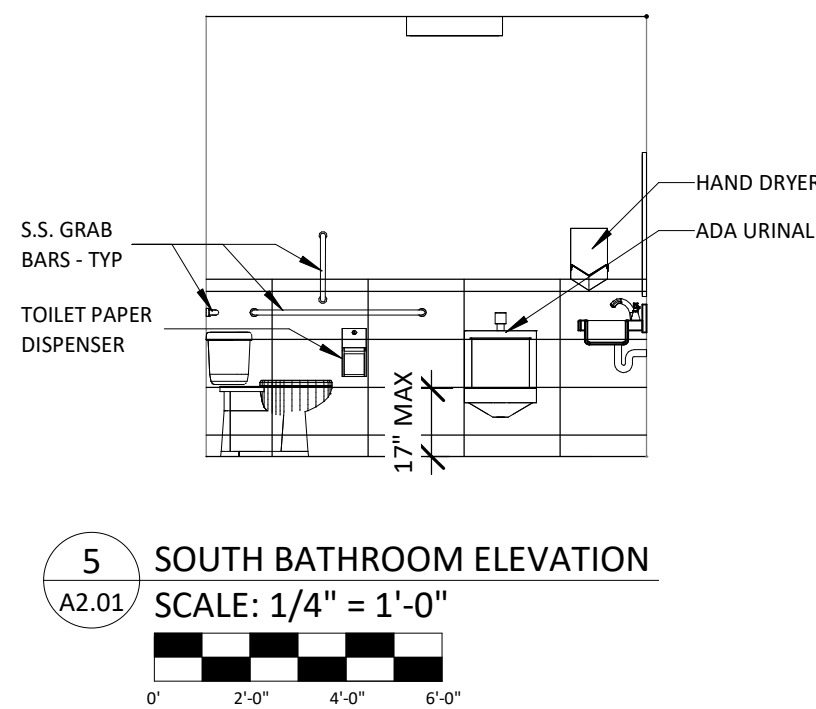
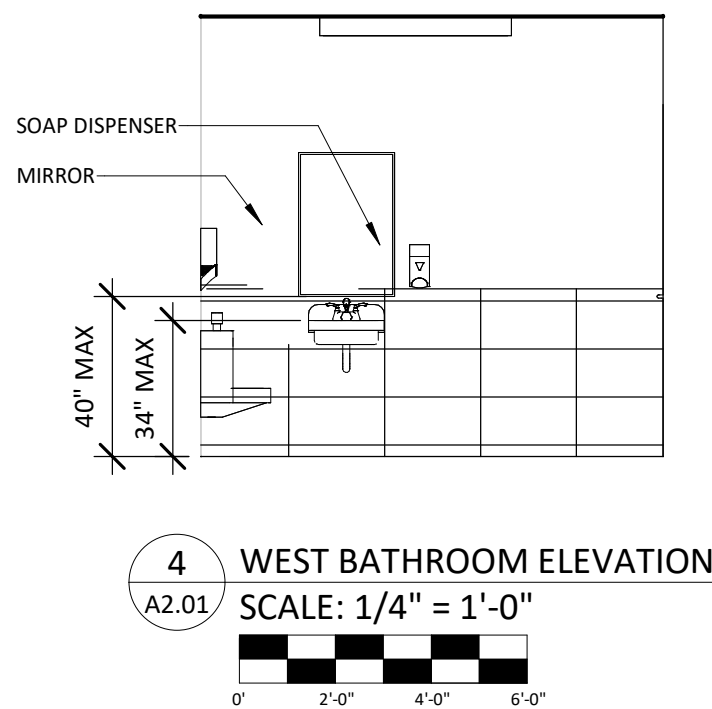
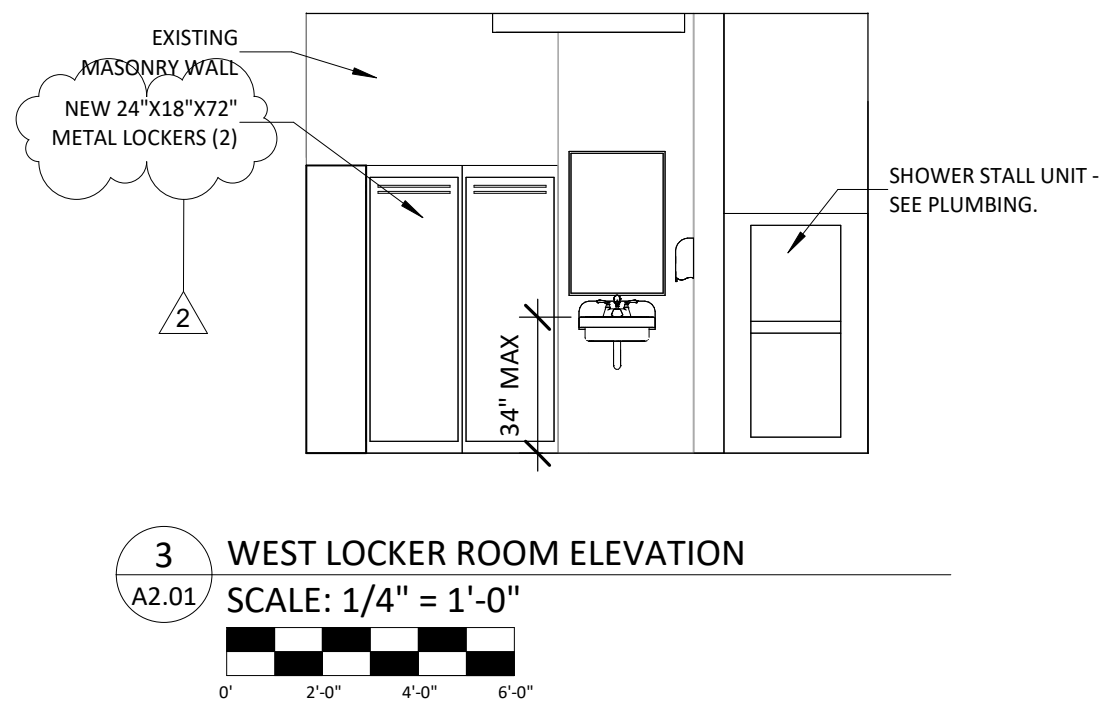
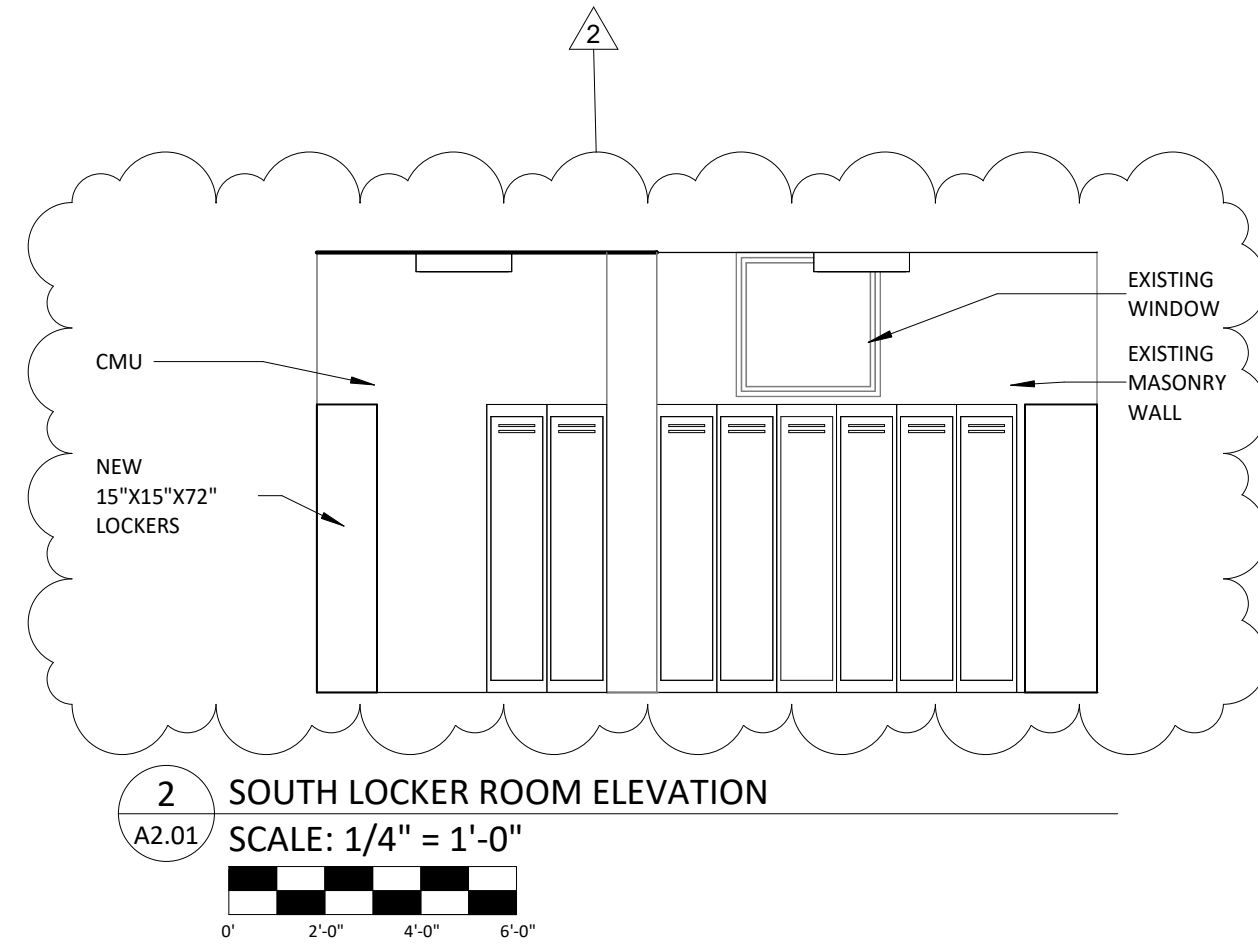
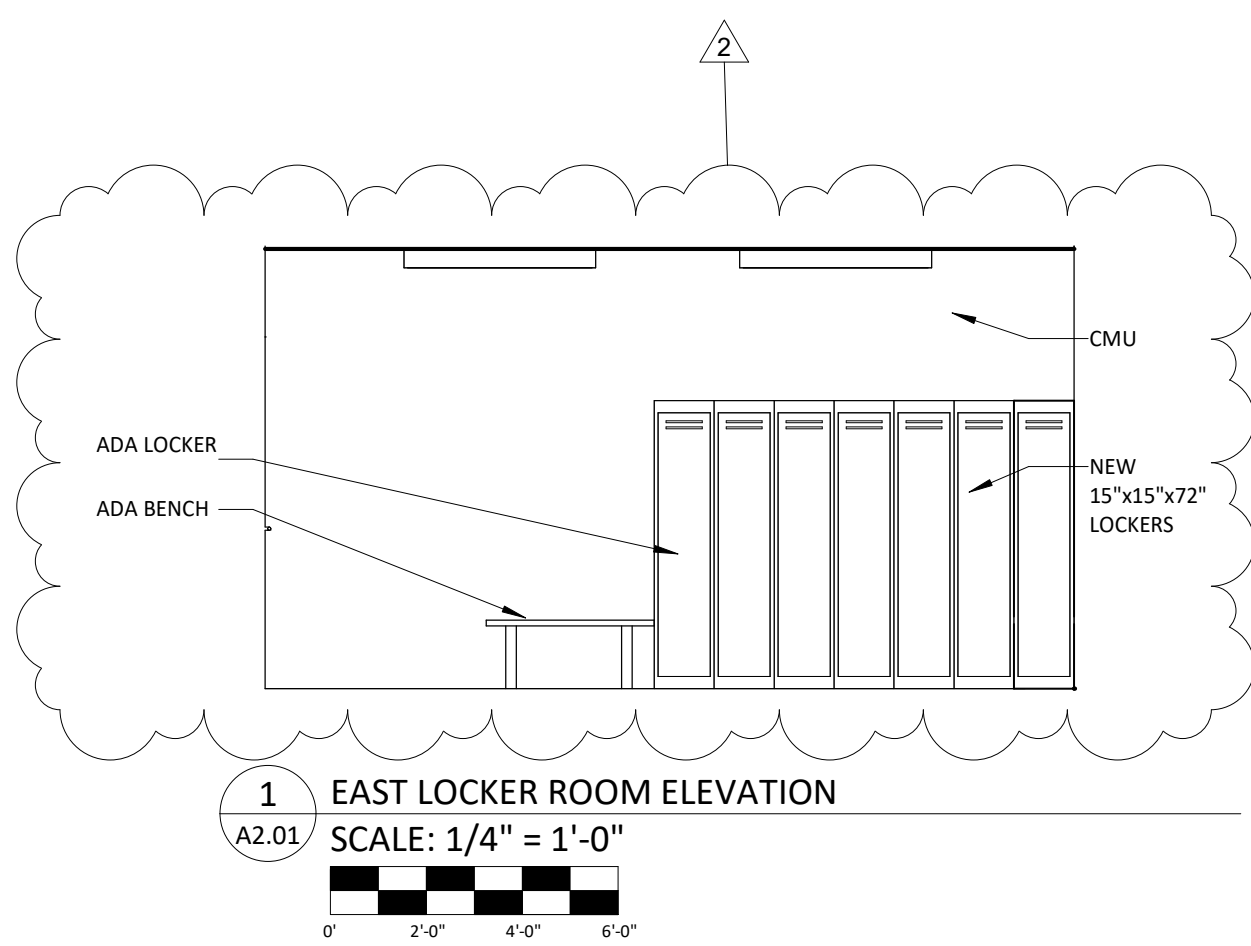
REFLECTED CEILING PLAN NOTES:

1. ALL CEILING ELEVATIONS IDENTIFIED DENOTE HEIGHT ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE.
2. REFER TO MECHANICAL, PLUMBING, ELECTRICAL, FIRE PROTECTION, AND TECHNOLOGY DRAWINGS BY OTHERS FOR CEILING MOUNTED EQUIPMENT AND COMPONENTS NOT IDENTIFIED ON ARCHITECTURAL DRAWINGS.
4. PRIOR TO BEGINNING ANY WORK, NOTIFY THE ARCHITECT IF EXISTING CONDITIONS PREVENT NEW CEILING SYSTEMS FROM BEING INSTALLED AS DRAWN AND NOTED.
5. LIGHT FIXTURES ARE TO BE CENTERED IN THE WIDTH OF THE ROOMS WHEREVER POSSIBLE.



LEVEL 1 KEY PLAN
NO SCALE

1. REFERENCED DEMOLITION NOTES REFER TO THE MINIMUM AMOUNT OF DEMOLITION REQUIRED TO ACCOMMODATE THE NEW CONSTRUCTION. TRADE CONTRACTORS SHALL VISIT PROJECT SITE TO BECOME FAMILIAR WITH COMPLETE SCOPE OF REMOVALS/DEMOLITIONS AND FIELD VERIFY THE EXTENT OF DEMOLITION.
2. EXISTING DIMENSIONS AND HATCHED AREAS ARE FOR GENERAL REFERENCE AND BIDDING PURPOSES ONLY. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD. THE ACTUAL AREA OF DEMOLITION SHOULD BE KEPT TO THE MINIMUM REQUIRED TO PROPERLY EXECUTE THE CONTRACT REQUIREMENTS.
3. IN THE EVENT THAT AN EXISTING ITEM NOT SHOWN ON THE DRAWINGS CONFLICTS WITH WORK UNDER THIS CONTRACT, CONTACT THE ARCHITECT PRIOR TO REMOVAL OF THAT ITEM.
4. ALL UTILITIES SHALL REMAIN IN SERVICE FOR OTHER OCCUPANCIES. ANY SHUTDOWNS OF BUILDING MUST BE APPROVED BY OWNER AND OCCUR AT OFF HOURS AS DEFINED BY OWNER.
5. THE OWNER HAS FIRST RIGHT OF REFUSAL FOR ALL MATERIAL OR EQUIPMENT IDENTIFIED TO BE REMOVED. ALL ITEMS NOT TURNED OVER TO THE OWNER SHALL BE DISPOSED OF PROPERLY AND LAWFULLY.
6. REFER TO DRAWINGS FOR LOCATIONS OF ALL ITEMS TO BE REINSTALLED. ALL ITEMS NOT SPECIFICALLY INDICATED FOR REINSTALLATION ON DRAWINGS ARE TO BE TURNED OVER TO THE OWNER. ALL ITEMS NOT TURNED OVER TO THE OWNER SHALL BE DISPOSED OF PROPERLY AND LAWFULLY.
7. ALL REMOVED ITEMS IDENTIFIED FOR REINSTALLATION OR TO BE TURNED OVER TO THE OWNER SHALL BE PROTECTED UNTIL TIME OF REINSTALLATION OR OWNER POSSESSION. DAMAGED ITEMS SHALL BE REPAIRED OR REPLACED BY THE RESPONSIBLE TRADE CONTRACTOR.
8. THROUGHOUT DEMOLITION AND CONSTRUCTION, PROTECT ITEMS SCHEDULED TO REMAIN AND/OR ALL ADJACENT MATERIALS AND EQUIPMENT, ETC. INDICATED TO REMAIN. COORDINATE REMOVAL AND PROTECTIONS WITH OWNER.
9. COORDINATE WITH OWNER ACCESS AND LOCATIONS OF TEMPORARY PARTITION. TEMPORARY PARTITION MUST BE DUSTPROOF.
10. AT REMOVAL OF SELECTED DEMOLITION ITEMS WHERE NO NEW CONSTRUCTION IS IDENTIFIED, PATCH, CLEAN, PREPARE, AND PAINT SURFACES TO MATCH FINISH COLOR, TEXTURE AND SHEEN OF ADJACENT SURFACES.
11. AT ITEMS TO BE REMOVED, ALSO REMOVE ALL ASSOCIATED BRACKETS, SUPPORTS, FASTENERS, ANCHORS, ETC. PATCH, CLEAN, PREPARE, AND PAINT SURFACES TO MATCH FINISH COLOR, TEXTURE AND SHEEN OF ADJACENT SURFACES.
12. PATCH ALL CEILINGS, WALLS AND FLOORS WHERE MECHANICAL, ELECTRICAL, TECHNOLOGY, PLUMBING AND FIRE PROTECTION COMPONENTS ARE TO BE REMOVED IN AN EXISTING CEILINGS, WALLS OR FLOORS TO REMAIN.
13. ALL WALL DEMOLITION SHALL HAVE CLEAN, VERTICAL, SMOOTH CUTS. PATCH, REPLACE AND/OR FILL VOIDS IN WALLS TO REMAIN TO PROVIDE A SMOOTH SURFACE/EDGE FOR THE APPLICATION OF NEW FINISH MATERIAL.
14. WHEN REMOVING EXISTING WALL TILE, FLOOR TILE, RUBBER BASE OR CEILING TILE, REMOVE FINISHES TO THE NEAREST JOINT WHICH ABUTS TILE NOT AFFECTED BY THE CONSTRUCTION. PROTECT THE SURFACES AND EDGES OF EXISTING FINISHES TO REMAIN.
15. AT AREAS WHERE DEMOLITION OF THE FLOORING EXPOSES THE CONCRETE SUBSTRATE: COMPLETELY REMOVE THE MASTIC AND FILL ALL CRACKS AND SPALLED AREAS IN PREPARATION FOR NEW FLOORING MATERIAL. REMOVAL OF FLOORING MATERIAL INCLUDES REMOVAL OF ADJACENT WALL BASE MATERIAL.
16. AT IDENTIFIED AREAS OF SPALLED, UNEVEN AND/OR SEPARATED CONCRETE SLABS: REMOVE ALL LOOSE MATERIAL: GRIND CONCRETE TO ACHIEVE A LEVEL SURFACE AND FILL CRACKS AND SPALLED AREAS IN PREPARATION FOR INSTALLATION OF FINISHED FLOORING.
17. CONTRACTOR SHALL REMOVE EXISTING PLUMBING, MECHANICAL, ELECTRICAL OR OTHER MISCELLANEOUS ITEMS REQUIRED TO COMPLETE NEW WORK BUT NOT REQUIRED TO REMAIN.
18. WHEN REMOVING INTERIOR OR EXTERIOR WALL ASSEMBLIES, CONTRACTOR SHALL ALSO REMOVE ALL ASSOCIATED POWER AND DATA RECEPTACLES, SWITCHES, ETC. REROUTE CONCEALED MEPPP WHERE REQUIRED TO MAINTAIN FUNCTIONING SYSTEMS; REMOVE ABANDONED MEPPP SYSTEMS TO SOURCE AND CAP APPROPRIATELY. REFER TO MECHANICAL, ELECTRICAL, TECHNOLOGY, LOW VOLTAGE, PLUMBING AND FIRE PROTECTION DRAWINGS FOR ADDITIONAL INFORMATION.
19. CONTRACTOR SHALL REMOVE ALL DEBRIS AND TRASH RESULTING FROM CONSTRUCTION ON A DAILY BASIS.
20. GENERAL CONTRACTOR SHALL RECYCLE DEMOLITION CONSTRUCTION DEBRIS IN ACCORDANCE WITH AUTHORITIES HAVING JURISDICTION AND SUSTAINABLE BEST PRACTICES.
21. IN THE EVENT HAZARDOUS MATERIALS ARE UNCOVERED GENERAL CONTRACTOR IS TO NOTIFY THE OWNER AND THE APPROPRIATE AUTHORITIES. THE ARCHITECT IS NOT RESPONSIBLE FOR REMOVAL / ABATEMENT OF HAZARDOUS MATERIALS. CONTRACTOR TO PROVIDE REMOVAL / ABATEMENT AT LOCATIONS NECESSARY.
22. REFER TO THE CIVIL, LANDSCAPE, STRUCTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION, ELECTRICAL, AND TECHNOLOGY DRAWINGS FOR THE DEMOLITION WORK SPECIFIC TO THOSE DISCIPLINES.
23. STRUCTURAL ITEMS SHOWN AS "TO BE REMOVED" ARE FOR REFERENCE ONLY. VERIFY APPROPRIATE SHORING OR REINFORCEMENT CONDITION WITH STRUCTURAL DRAWINGS.



DOORS, FRAMES AND HARDWARE NOTES

- GENERAL:**
- ALL DOOR AND FRAME TYPES ARE SHOWN AS EXTERIOR VIEW.
 - FRAME WIDTHS ARE INDICATED ON THE FLOOR PLANS. FRAME HEIGHTS ARE INDICATED ON THE FRAME TYPES. DOOR DIMENSIONS ARE INDICATED ON THE DOOR AND FRAME SCHEDULE.
 - DIMENSIONS ARE INDICATED FOR BIDDING PURPOSES ONLY AND SHALL BE FIELD VERIFIED PRIOR TO PREPARATION OF SHOP DRAWINGS AND FABRICATION.
 - THE MANUFACTURER(S) SHALL BE RESPONSIBLE FOR THE ENGINEERING AND STRUCTURAL INTEGRITY OF THEIR FRAME SYSTEMS.
 - ALL FRAMES IN MASONRY OPENINGS REQUIRE A LINTEL. REFER TO DOOR AND FRAME SCHEDULE AND/OR STRUCTURAL DRAWINGS.
 - ALL OPENINGS IN FRAMES REQUIRE GLAZING PANELS OR INFILL PANELS EXCEPT FOR DOOR OPENINGS. GLAZING TYPES FOR EXTERIOR FRAMES ARE INDICATED ON THE FRAME TYPES. GLAZING TYPES FOR INTERIOR FRAMES ARE INDICATED ON THE DOOR AND FRAME SCHEDULE OR HEREIN.
 - ALL OPENINGS IN DOORS REQUIRE GLAZING PANELS UNLESS NOTED OTHERWISE. GLAZING TYPES FOR DOORS ARE INDICATED ON THE DOOR AND FRAME SCHEDULE OR HEREIN.
 - HARDWARE SETS AND GLAZING TYPES ARE SPECIFIED IN THE PROJECT MANUAL.
 - FRAMES SHALL BE DESIGNED, CUT, AND FABRICATED TO MINIMIZE JOINTS:
 - JOINTS IN HOLLOW METAL FRAMES SHALL RECEIVE METAL FILLER, BE GRIND SMOOTH AND SHOPFIELD PRIMED PRIOR TO FINISH PAINT.
 - JOINTS IN EXTERIOR ALUMINUM FRAMES SHALL BE AIR AND WATER TIGHT IN ACCORDANCE WITH THE REQUIREMENTS IDENTIFIED IN THE PROJECT MANUAL. LAP AND SEAL ALL JOINTS. ALLOW FOR EXPANSION IN THE TRIM AND AT JOINTS AND INTERSECTIONS OF ADJACENT FRAMES.
- HOLLOW METAL DOORS AND FRAMES:**
- ALL HOLLOW METAL FRAMES SHALL HAVE THE FOLLOWING CHARACTERISTICS UNO:
 - FACE WIDTH: 2"
 - FRAME DEPTH: 5-3/4" UNO
 - THROAT: 4-7/8"
 - RETURN: 7/16"
 - ANCHORAGE AT HOLLOW METAL FRAMES:
 - PROVIDE FASTENERS AT 18" ON CENTER AND MINIMALLY THREE (3) ANCHORS PER JAMB.
 - AT FRAMES INSTALLED PRIOR TO MASONRY INSTALLATION PROVIDE GALVANIZED STEEL "T" ANCHORS.
 - AT FRAMES INSTALLED AFTER MASONRY INSTALLATION OR AT EXISTING MASONRY OPENINGS PROVIDE GALVANIZED STEEL SPACER BRACKETS, ANCHOR SLEEVES WELDED TO THE INTERIOR OF THE FRAME, AND COUNTERSUNK 3/8" FLATHEAD EXPANSION ANCHORS. COVER HEAD OF FASTENERS WITH METAL FILLER, GRIND SMOOTH, PRIME AND FINISH PAINT.
 - JAMBS OF FRAMES INSTALLED IN EXTERIOR WALLS AND WHERE INDICATED SHALL BE GROUTED SOLID. COVER GROUT HOLES WITH METAL FILLER, GRIND SMOOTH, PRIME AND FINISH PAINT.

DOOR HARDWARE SETS

DOOR HARDWARE TO BE US-26 OR US-32D FINISH.

HARDWARE SET 1 - EXTERIOR HM DOOR (SINGLE)

- 3 - HEAVY WEIGHT MORTISE HINGES
1 - MORTISE LOCK EXIT DEVICE WITH LEVER TRIM
1 - SURFACE MOUNTED DOOR CLOSER WITH STOP ARMS
1 - THRESHOLD
1 - WEATHERSTRIPPING
1 - DOOR SWEEPS
1 - DRIP CAP

HARDWARE SET 2 - INTERIOR HM DOOR (SINGLE)

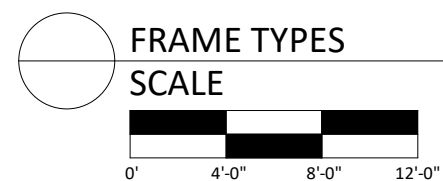
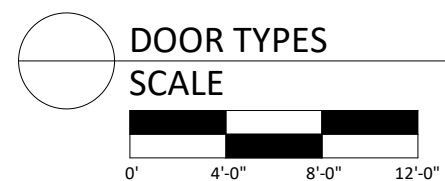
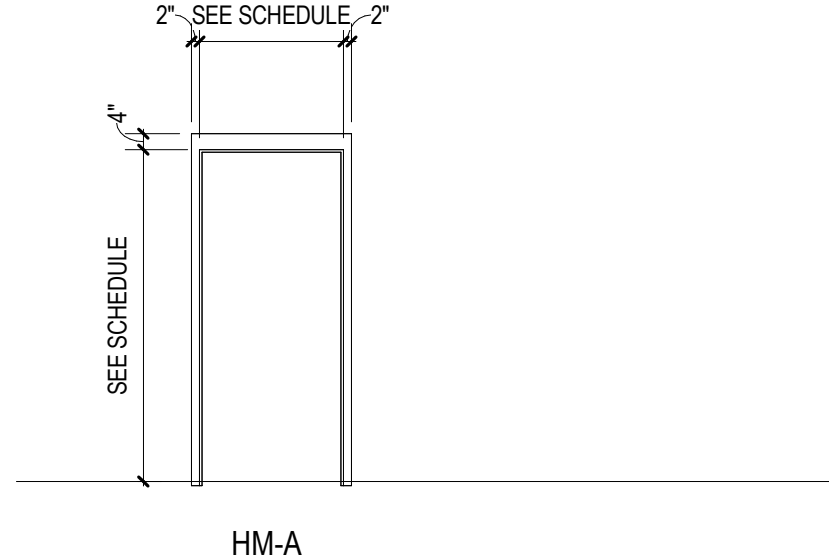
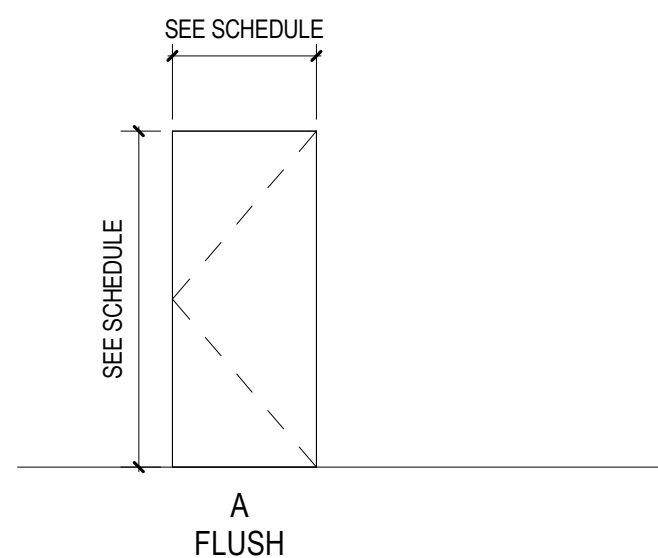
- 3 - HEAVY WEIGHT MORTISE HINGES
1 - PUSH/PULL
1 - SURFACE MOUNTED DOOR CLOSER WITH STOP ARMS

HARDWARE SET 3 - INTERIOR HM DOOR (SINGLE)

- 3 - HEAVY WEIGHT MORTISE HINGES
1 - LEVER STYLE PRIVACY LOCKSET W/ INDICATOR
1 - SURFACE MOUNTED DOOR CLOSER WITH STOP ARMS

DOOR SCHEDULE

MARK	WIDTH	HEIGHT	DOOR TYPE	MATERIAL	FINISH	FRAME TYPE	FRAME MATERIAL	FRAME FINISH	HARDWARE GROUP	REMARKS
101	3'-0"	7'-0"	A	HM	PT	HM-A	HM	PT	SET 1	
102	3'-0"	7'-0"	A	HM	PT	HM-A	HM	PT	SET 2	
103	3'-0"	7'-0"	A	HM	PT	HM-A	HM	PT	SET 3	



PHASE

- ☐ PRELIM
☐ PERMIT
☐ FINAL
☒ BID
☐ CONST

WHA No.
1854D23

DATE
11/07/2024

SHEET No.
A2.01

ROCK ISLAND CO MILAN FACILITY
851 10TH AVE W. MILAN, IL 61264
INTERIOR ELEVATIONS

WILLETT HOFMANN & ASSOCIATES, INC.
ENGINEERING ARCHITECTURE LAND SURVEYING
625 32ND AVE SW CEDAR RAPIDS, IA 52404
1-319-378-1401

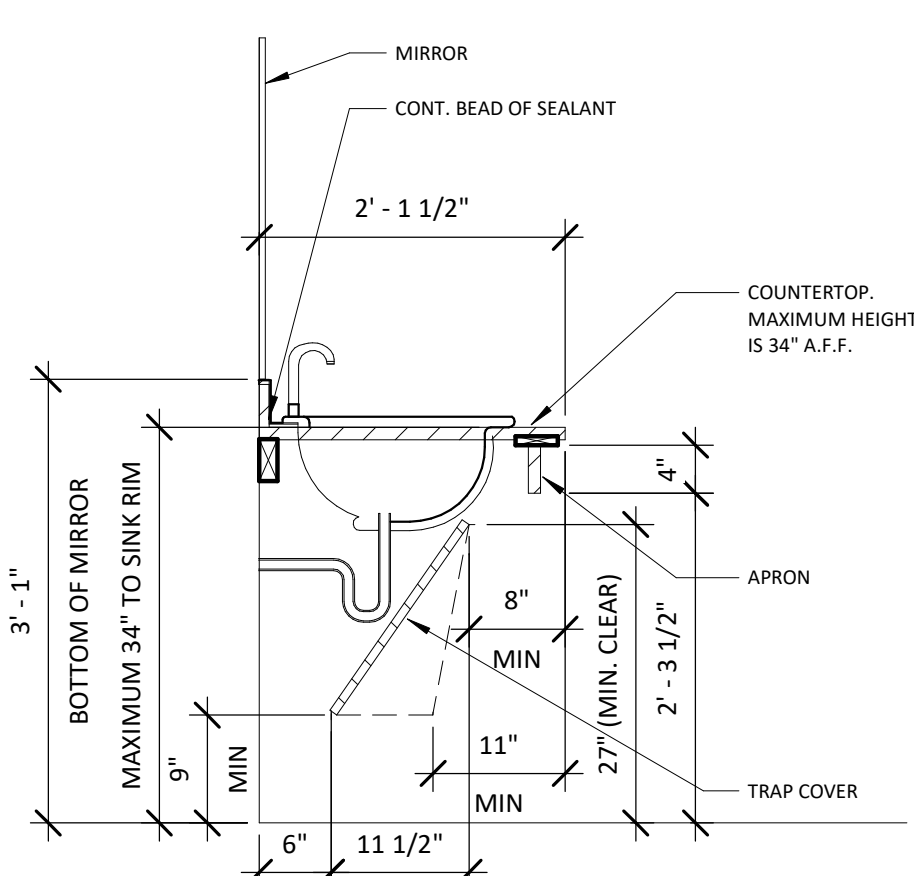
REMARKS

BY

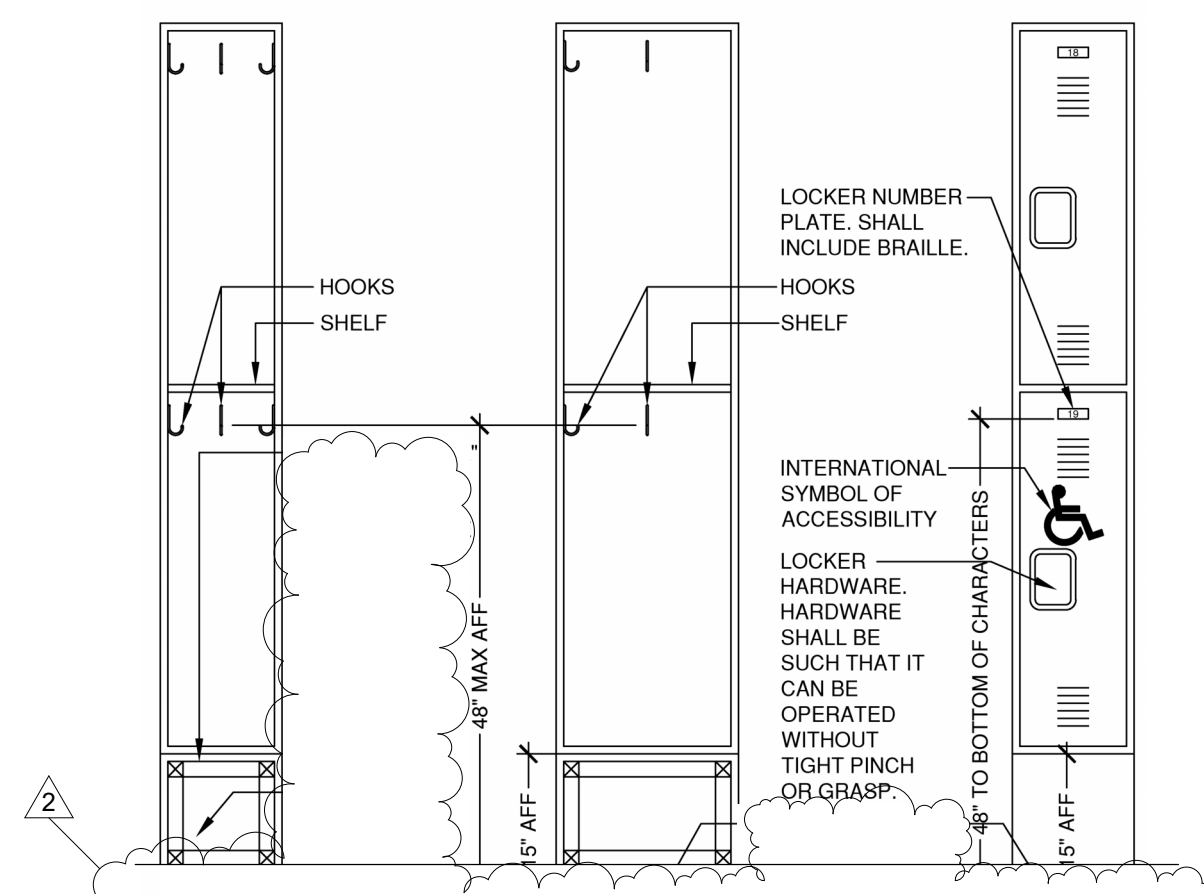
DATE

REV.

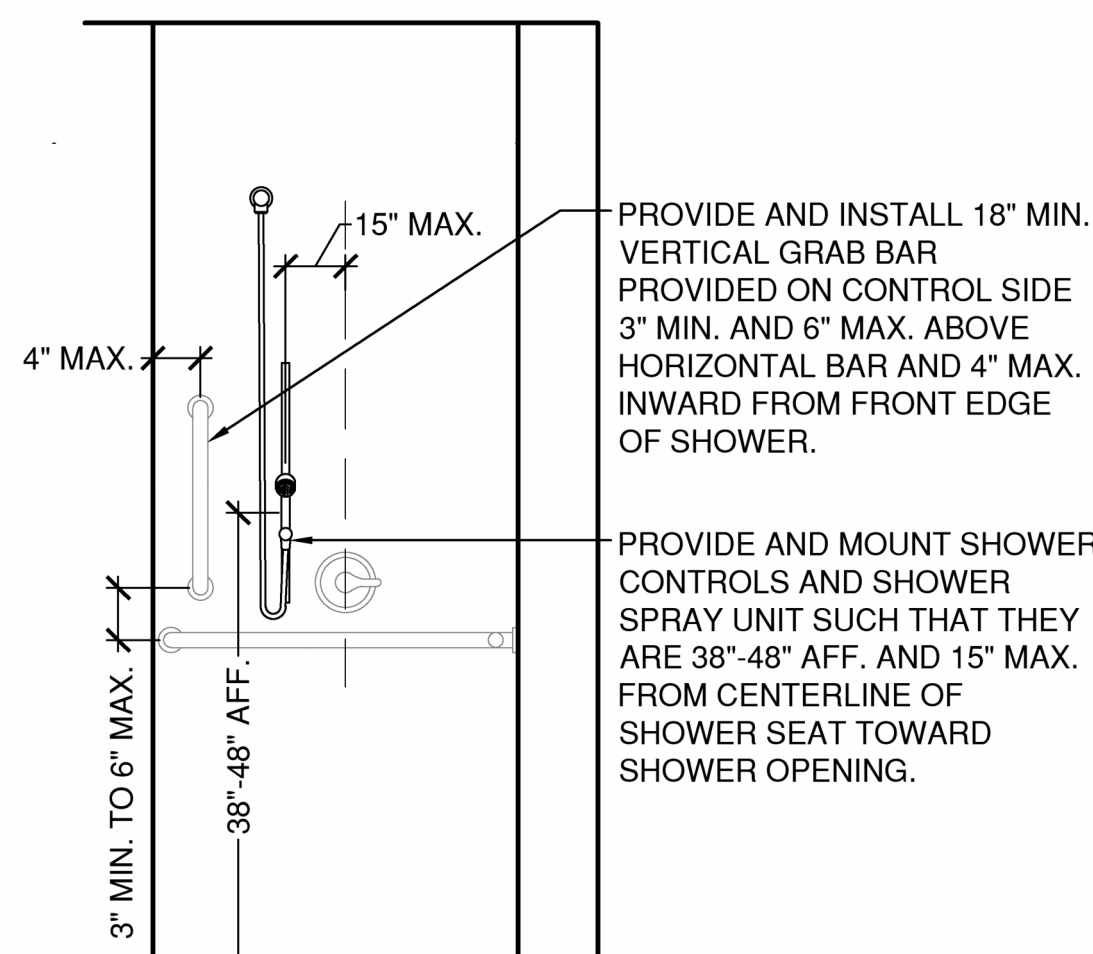
DESIGNED
DRAWN
REVIEWED
APPROVED



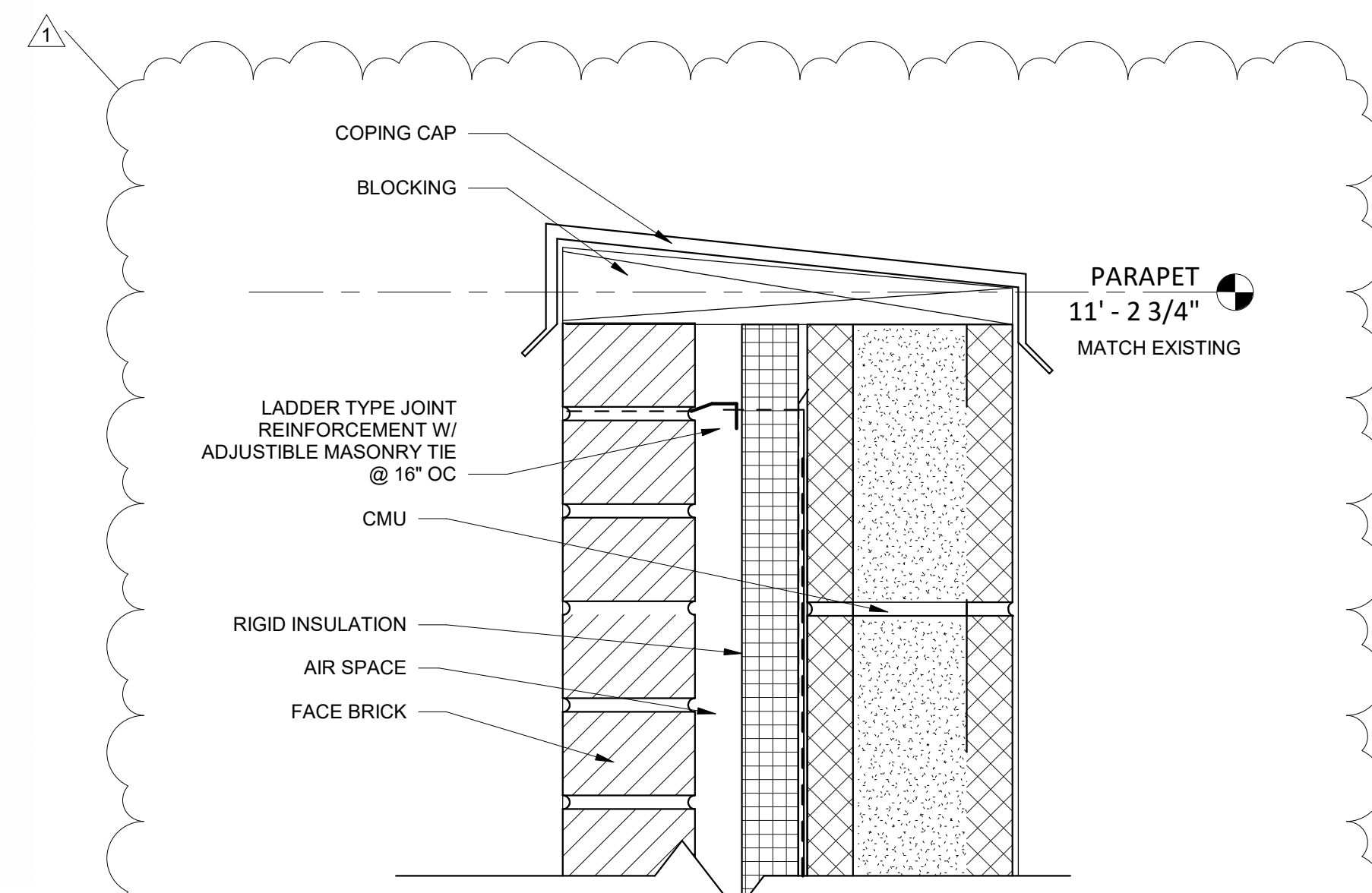
1 ADA VANITY
SCALE: 3/4" = 1'-0"
0' 2'-0" 2'-0"



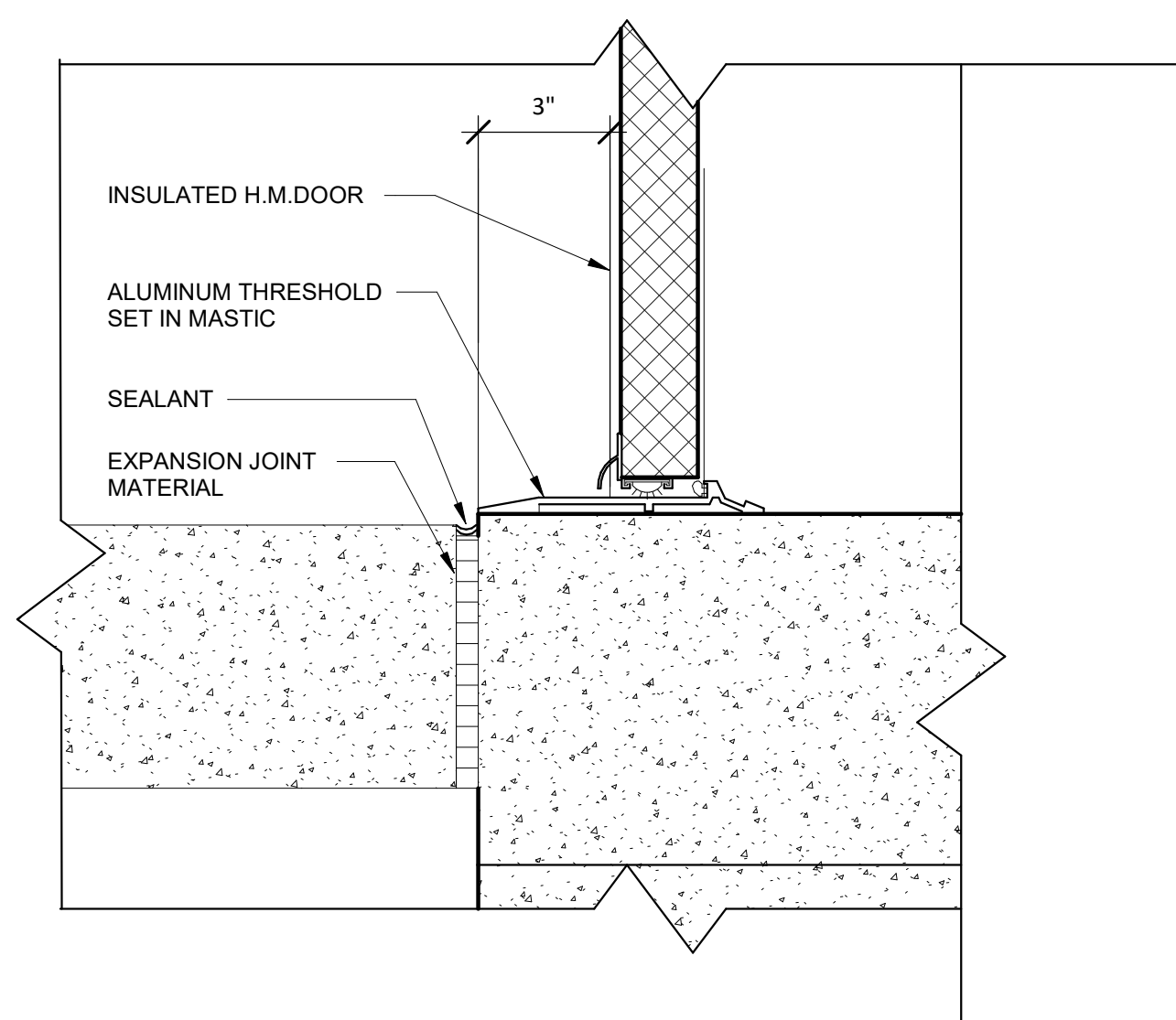
2 ADA LOCKERS
NO SCALE



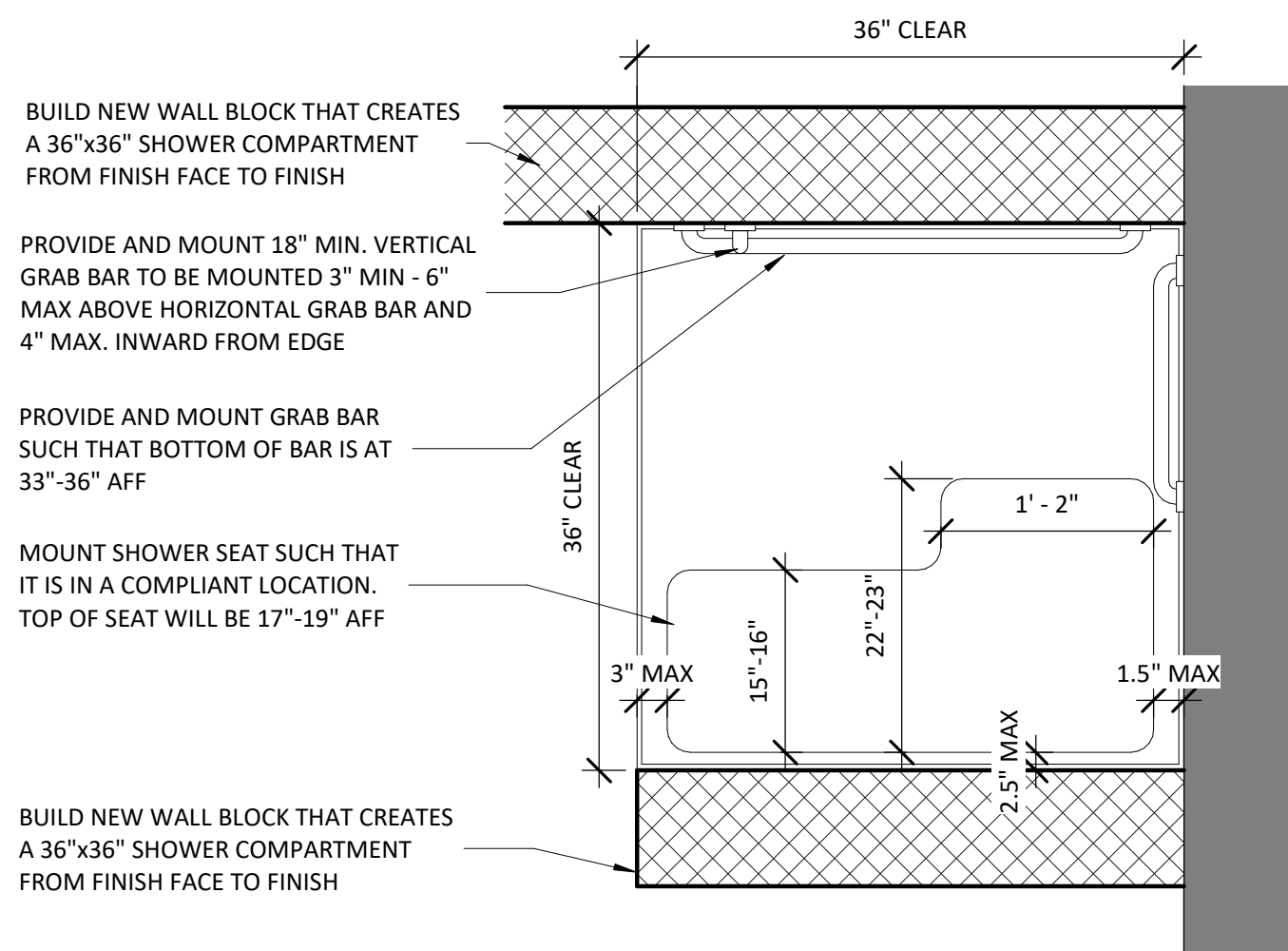
3 ADA SHOWER ELEVATION
NO SCALE



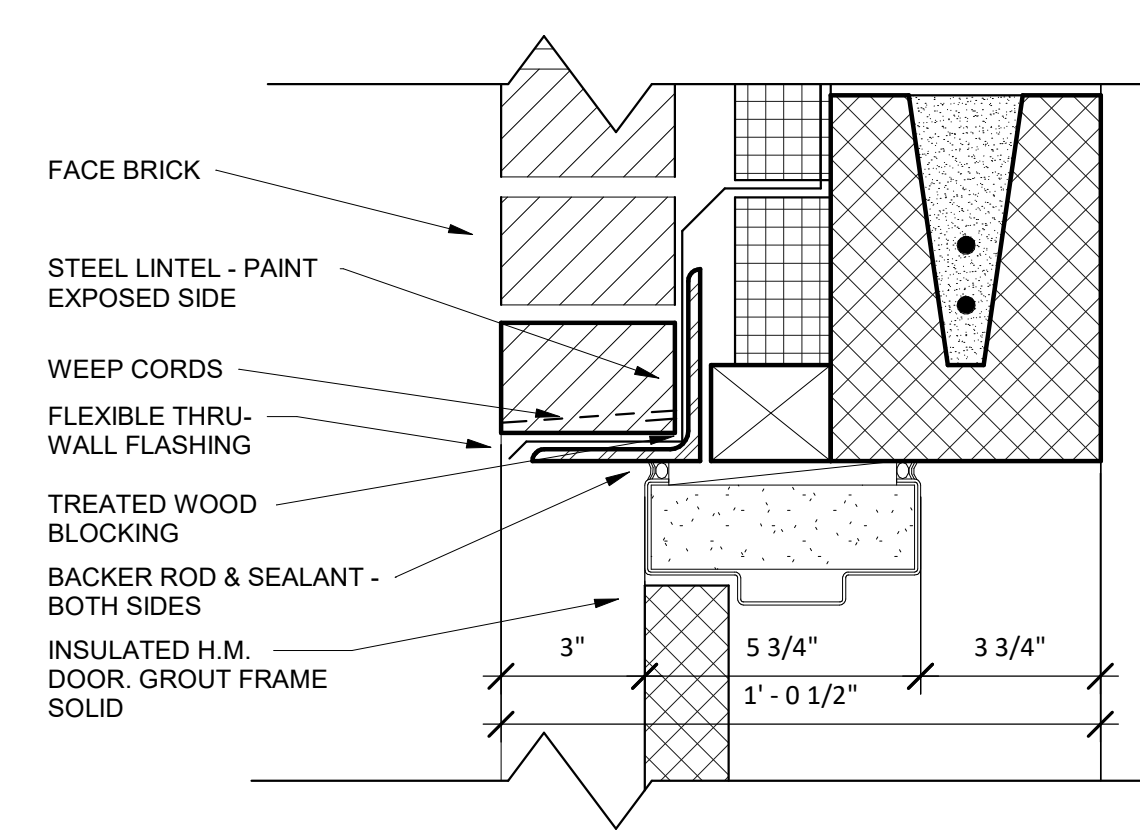
4 WINDOW HEAD/PARAPET
SCALE: 3" = 1'-0"
0' 0'-6" 1'-0"



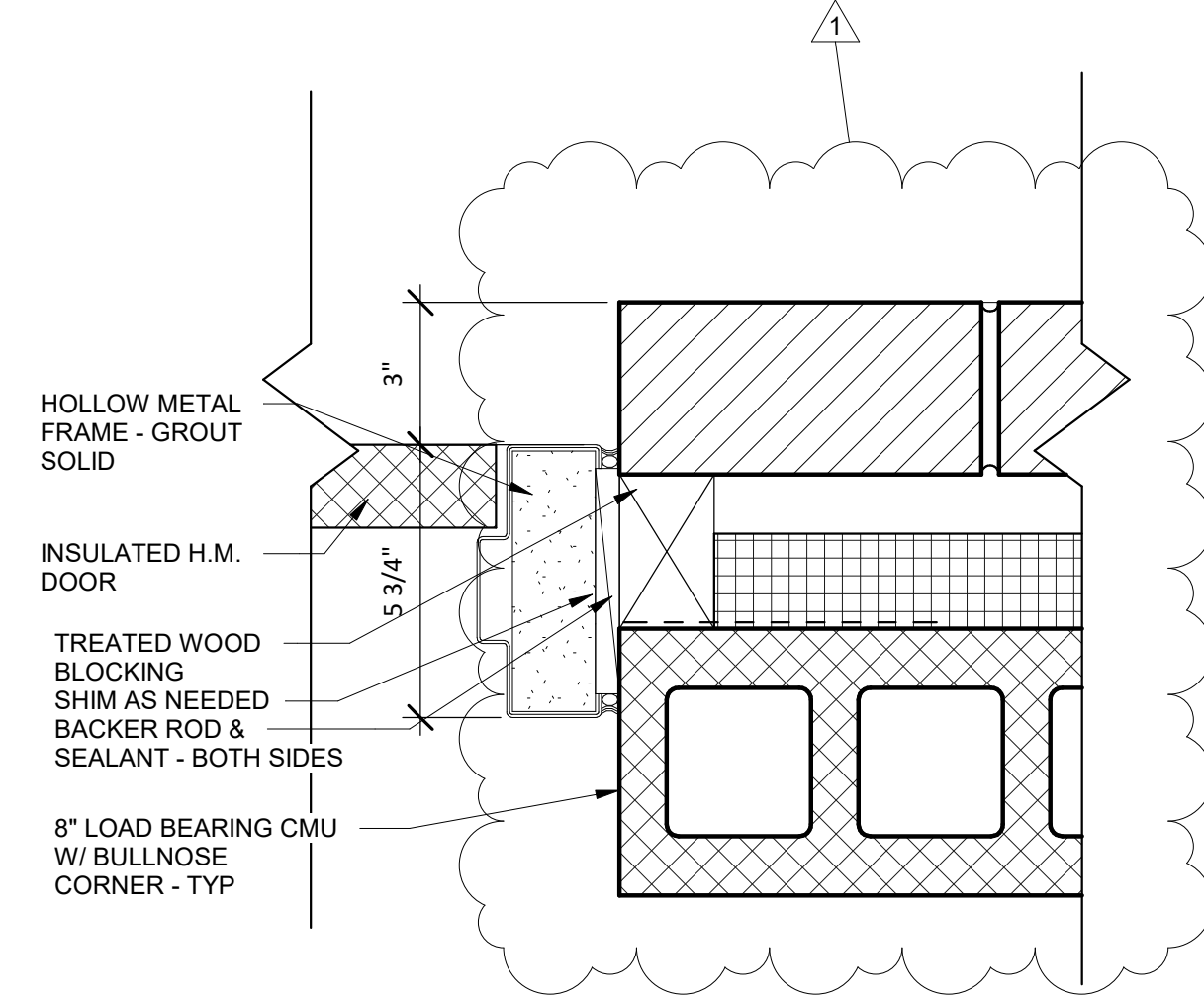
5 H.M. DOOR SILL DETAIL
SCALE: 3" = 1'-0"
0' 0'-6" 1'-0"



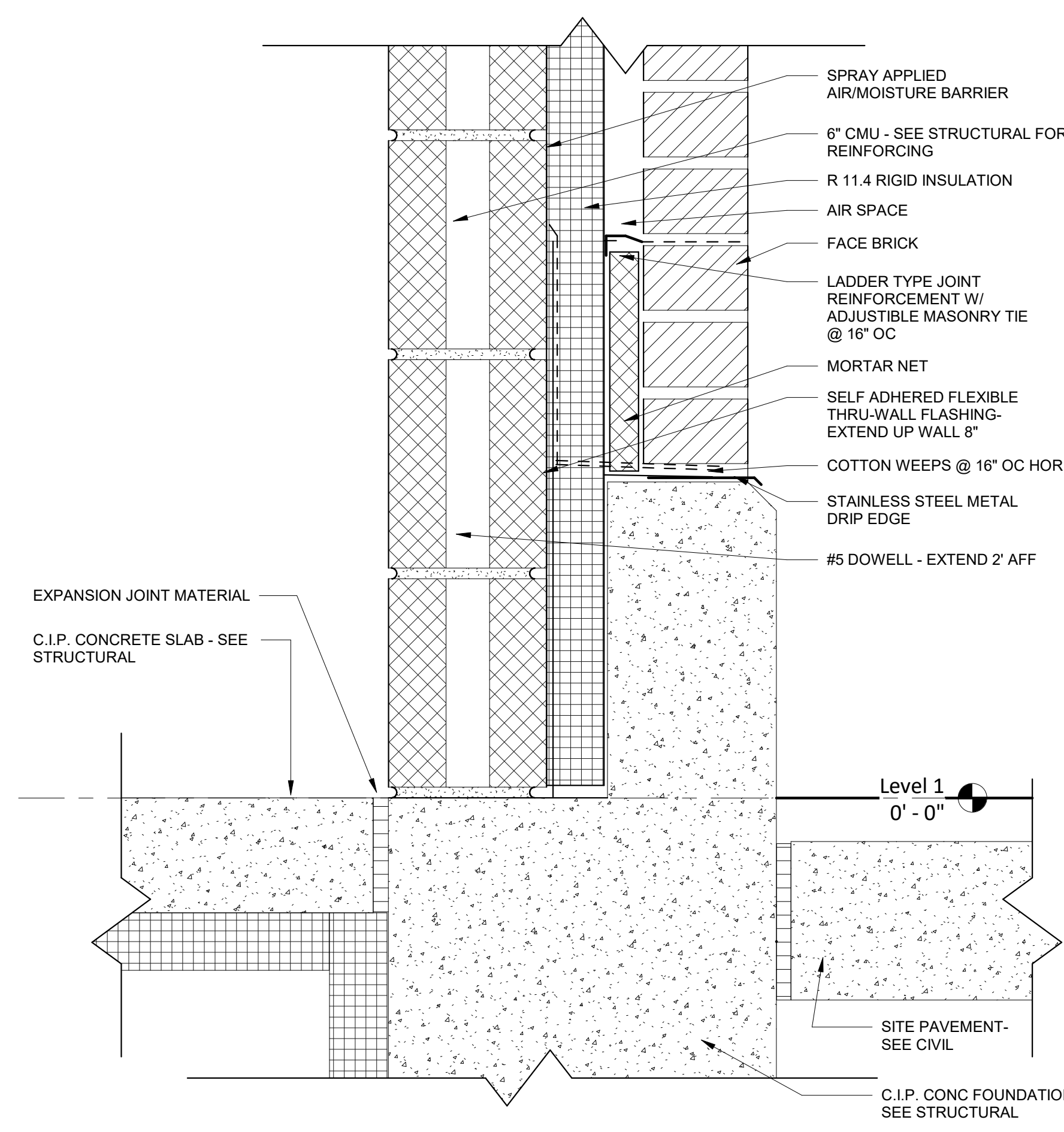
6 ADA SHOWER
SCALE: 1" = 1'-0"
0' 1'-0" 2'-0"



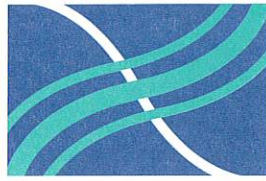
7 NEW EXTERIOR DOOR HEAD
SCALE: 3" = 1'-0"
0' 0'-6" 1'-0"



9 H.M. DOOR JAMB DETAIL
SCALE: 3" = 1'-0"
0' 0'-6" 1'-0"



8 WALL BASE
SCALE: 3" = 1'-0"
0' 0'-6" 1'-0"



**Rock
Island
County**

CLARIFICATION #1

TO: All Plan Holders of Record
FROM: Matthew M. Miller, County Engineer
DATE: November 7, 2024
RE: Section 23-00399-00-MG (Milan Maint. Garage – Locker Room Addition)

ACKNOWLEDGING ADDENDUMS

Addendums 1 & 2 include the following statement:

“ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE SPACE PROVIDED ON THE BID FORM. FAILURE TO DO SO MAY SUBJECT THE BIDDER TO DISQUALIFICATION.”

Attached is an example of an acceptable notation acknowledging their receipt. Please do not use the attached form as it is for example only. If you have any questions, please notify our office at (309) 787-4668.

OFFICE OF THE COUNTY ENGINEER

Rock Island County, Illinois

851 W 10th Avenue, P.O. Box 797, Milan, IL 61264

Phone: (309) 787-4668 * Fax: (309) 787-4680



Contains 30%
recycled post-consumer fiber

**NOT FOR
BIDDING**



Schedule of Prices



Maint. Garage Restroom Addition - Milan Yard

1. Each pay item should have a unit price and a total price.
2. If no total price is shown or if there is a discrepancy between the product of the unit price multiplied by the quantity, the unit price shall govern.
3. If a unit price is omitted, the total price will be divided by the quantity in order to establish a unit price.
4. A bid may be declared unacceptable if neither a unit price or total price is shown.